1. Directionally solidified Al2O3/(Y0.2Er0.2Yb0.2Ho0.2Lu0.2)3Al5O12 eutectic high-entropy oxide ceramics with well-oriented structure, high hardness, and low thermal conductivity

Accession number: 20213110714890
Authors: Zhong, Yujie (1); Xiang, Wangshuai (2); He, Liangting (2); Li, Jiaze (2); Hao, Juan (2); Tian, Zhilin (3); Wang, Xu (2)
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Corresponding author: Tian, Zhilin(tianzhlin@mail.sysu.edu.cn)
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Directionally solidified Al2O3/(Y0.2Er0.2Yb0.2Ho0.2Lu0.2)3Al5O12 eutectic high-entropy oxide ceramics (HEOCs) were successfully prepared with an optical floating zone furnace. The Al2O3/(Y0.2Er0.2Yb0.2Ho0.2Lu0.2)3Al5O12 eutectic HEOCs were pure phases with uniform distribution of rare-earth elements. The preferred growth orientation relationships were {0001}Al2O3 // {211}(Y0.2Er0.2Yb0.2Ho0.2Lu0.2)3Al5O12. The indentation fracture toughness and Vickers hardness were 6.8 ± 0.9 MPa·m1/2 and 16.1 ± 0.3 GPa, which were higher than that of Al2O3/Y3Al5O12 eutectic ceramics. The room temperature bending strength was 333 ± 42 MPa. Crack bridging, deflection and bifurcation were the main toughening mechanism. Hardness and reduced modulus mapping results illustrated that the hardness of (Y0.2Er0.2Yb0.2Ho0.2Lu0.2)3Al5O12 was close to that of Al2O3. Thermal expansion coefficient of Al2O3/(Y0.2Er0.2Yb0.2Ho0.2Lu0.2)3Al5O12 eutectic HEOCs was very similar to that of Al2O3/Y3Al5O12 but thermal conductivity was as low as 4.9 Wm-1 K-1 due to strong lattice distortion. These results suggest that high-entropy Al2O3/(Y0.2Er0.2Yb0.2Ho0.2Lu0.2)3Al5O12 eutectic ceramics are promising candidates for structural components application in gas turbine engines. © 2021 Elsevier Ltd
Number of references: 71
Main heading: Eutectics
Controlled terms: Solidification - Thermal conductivity - Alumina - Entropy - Vickers hardness - Fracture toughness - Thermal expansion - Aluminum oxide - Rare earths - Bending strength
Uncontrolled terms: Al2O3/(Y0.2er0.2yb0.2ho0.2lu0.2)3al5O12 - Directionally solidified - Eutectic ceramics - Eutectic high-entropy oxide ceramic - High hardness - Mechanical - Oriented structure - Oxide ceramics - Property - Thermal
Classification code: 531.2 Metallography - 641.1 Thermodynamics - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 951 Materials Science
Numerical data indexing: Pressure 1.61E+10Pa, Pressure 3.33E+08Pa, Pressure 6.80E+06Pa, Temperature 1.00E00K
DOI: 10.1016/j.jeurceramsoc.2021.07.049
Funding Details: Number: XJ2019067, Acronym: -, Sponsor: -; Number: 51804252, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China; Number: 76180-31610012, Acronym: SYSU, Sponsor: Sun Yat-sen University; Number: -, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: 2021GY-133, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
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Compendex references: YES
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2. Quantitative analysis of coal quality by mutual information-particle swarm optimization (MI-PSO) hybrid variable selection method coupled with spectral fusion strategy of laser-induced breakdown spectroscopy (LIBS) and fourier transform infrared spectroscopy (FTIR)

Accession number: 20210609901789
Authors: He, Ting (1); Liang, Jing (1); Tang, Hongsheng (1); Zhang, Tianlong (1); Yan, Chunhua (2); Li, Hua (1, 2)
Author affiliation: (1) Key Laboratory of Synthetic and Natural Functional Molecule of the Ministry of Education, College of Chemistry & Materials Science, Northwest University, Xi'an; 710069, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Yan, Chunhua(huahua18254@163.com)
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Abbreviated source title: Spectrochim. Acta Part B At. Spectrosc.
Volume: 178
Issue date: April 2021
Publication year: 2021
Article number: 106112
Language: English
ISSN: 05848547
CODEN: SAASBH
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Coal quality analysis can provide basic work for the design and operation of related equipment and technological processes, which mainly including ash content and volatile matter. Variable selection plays an important role in the model and properly variable selection methods which can promote the predictive performance of the model and reduce the modeling time. In this article, a hybrid variable selection method mutual information-particle swarm optimization (MI-PSO) was used to realize precise screening of laser-induced breakdown spectroscopy (LIBS) and fourier transform infrared spectrometer (FTIR) spectral characteristic variables. Firstly, to obtain the fusion spectrum matrix, the pre-processed LIBS and FTIR spectrum matrix were directly connected end to end. Then the MI was used to eliminate redundant variables in the spectral data, and the PSO was used to further filter the retained variables to find a set of variables with higher prediction accuracy. Finally, a mutual information-particle swarm optimization-kernel extreme learning machine (MI-PSO-KELM) model is constructed based on the selected variables that the ash content and the volatile matter variables are 6499, 5093 respectively. The performance of MI-PSO-KELM is better than the KELM model based on LIBS and FTIR and the KELM model based on LIBS and FTIR primary spectral fusion, and can more accurately predict the ash content and volatile matter of coal quality analysis. The results for the determination of ash content, the optimal cross-validation (root mean square error of cross validation (RMSECV) =1.6170, determination coefficient of cross validation (RCV2) =0.9684) and prediction set the root mean square error of prediction (RMSEP) =0.9687, determination coefficient of prediction (RP2 = 0.9821) results are obtained by the MI-PSO based on primary spectral fusion model. For the determination of the volatile matter, the best results of cross-validation (RMSECV = 1.2886, RCV2=0.9868) and prediction set (RMSEP = 1.3218, RP2=0.9789) are obtained by the MI-PSO based on primary spectral fusion model. It shows that the spectral fusion technology can help improve the performance of LIBS spectral quantitative analysis, and a spectrum fusion method based on LIBS and FTIR is established to realize the rapid determination of ash content and volatile matter of coal. © 2021 Elsevier B.V.
Number of references: 40
Main heading: Fourier transform infrared spectroscopy
Controlled terms: Matrix algebra - Knowledge acquisition - Swarm intelligence - Atomic emission spectroscopy - Forecasting - Mean square error - Particle swarm optimization (PSO) - Quality control - Spectrometers - Laser induced breakdown spectroscopy - Machine learning - Spectrum analysis
Uncontrolled terms: Determination coefficients - Extreme learning machine - Fourier transform infrared spectrometer - Laserinduced breakdown spectroscopy (LIBS) - Root-mean-square error of predictions - Spectral characteristics - Spectral fusion technologies - Variable selection methods
Classification code: 723 Computer Software, Data Handling and Applications - 723.4 Artificial Intelligence - 741.3 Optical Devices and Systems - 801 Chemistry - 913.3 Quality Assurance and Control - 921.1 Algebra - 921.5 Optimization Techniques - 922.2 Mathematical Statistics - 931.1 Mechanics
DOI: 10.1016/j.sab.2021.106112
Funding Details: Number: 21675123,21873076,22073074, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 20JS144, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: WSFRM20190503001, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 22073074 , No. 21873076 , No. 21675123); the key laboratory of well stability and fluid & rock mechanics in oil and gas reservoir of

Shaanxi province, Xi'an Shiyou University (No. WSFRM20190503001); and Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 20JS144).
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Data Provider: Engineering Village
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3. High-Efficiency (>14%) and Air-Stable Carbon-Based, All-Inorganic CsPbI2Br Perovskite Solar Cells through a Top-Seeded Growth Strategy

Accession number: 20211810281571
Authors: Zhu, Weidong (1); Chai, Wenming (1); Chen, Dandan (2); Ma, Junxiao (1); Chen, Dazheng (1); Xi, He (1); Zhang, Jincheng (1); Zhang, Chunfu (1); Hao, Yue (1)
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Publication year: 2021
Pages: 1500-1510
Language: English
E-ISSN: 23808195
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: The inferior crystallinity and phase stability of CsPbI2Br films have severely hindered the development of carbon-based, all-inorganic perovskite solar cells (PSCs). Herein, we demonstrate the preparation of CsPbI2Br films by the top-seeded solution growth (TSSG) technique. It is performed through spin-coating of CH3NH3Br (MABr) atop CsPbI2Br precursor film prior to annealing, during which perovskite seeds are generated atop it. These perovskite seeds not only serve as nuclei to regulate the growth of CsPbI2Br grains but also provide additional Br- anions to generate a thin Br-rich layer atop the final CsPbI2Br film. The former contributes to the formation of CsPbI2Br film with full coverage, larger grains, higher crystallinity, and fewer electronic defects, while the latter gives rise to residual compressive strain along the film and thus markedly boosts its phase stability. Consequently, the optimized carbon-based, all-inorganic PSC exhibits a much better efficiency of 14.84% coupled with favored storage and operational stability. ©
Number of references: 59
Main heading: Bromine compounds
Controlled terms: Perovskite solar cells - Crystallinity - Efficiency - Carbon films - Film growth - Phase stability - Carbon - Film preparation - Lead compounds - Perovskite
Uncontrolled terms: Carbon-based - Compressive strain - Electronic defects - High-efficiency - Operational stability - Precursor films - Top seeded solution growth - Top-seeded growth
Classification code: 482.2 Minerals - 702.3 Solar Cells - 801.4 Physical Chemistry - 804 Chemical Products Generally - 813.2 Coating Materials - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids - 933.1 Crystalline Solids
Numerical data indexing: Percentage 1.48e+01%
DOI: 10.1021/acsenergylett.1c00325
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Compendex references: YES

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Data Provider: Engineering Village
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4. A High-Sensitivity Low-Temperature Sensor Based on Michelson Interferometer in Seven-Core Fiber

Accession number: 20213910957434
Authors: Shao, Min (1); Zhang, Rong (1); Gao, Hong (1); Liu, Yinggang (1); Qiao, Xueguang (2); Lin, Yinglong (3)
Author affiliation: (1) Key Laboratory on Photoelectric Oil-Gas Logging and Detecting, School of Science, Ministry of Education, Xi'An Shiyou University, Xi'an; 710065, China; (2) School of Physics, Northwest University, Xi'an; 710127, China; (3) II-VI Photonics Inc., Fuzhou; 350014, China
Corresponding author: Shao, Min(shaomin@xsyu.edu.cn)
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Issue date: December 1, 2021
Publication year: 2021
Pages: 1293-1296
Language: English
ISSN: 10411135
E-ISSN: 19410174
CODEN: IPTLEL
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: An in-fiber Michelson interferometer (MI) formed by seven-core fiber (SCF) for low-temperature sensing is proposed and experimentally demonstrated. The sensor head is constructed by a section of seven-core fiber splicing a single-mode fiber (SMF) with a taper. When the external temperature changes, the interference spectrum of the MI will shift due to thermal expansion and thermo-optic effects. By measuring the wavelength variations of the interference dip, the external temperature can be determined. Experimental results proves that the sensor exhibits a maximum linear temperature sensitivity of -0.0775 nm/°C in the temperature range of -60 °C to 15 °C, and the standard deviation is 5% in stability test. The sensor possesses high sensitivity and easy fabrication, which makes it could be a good candidate in low-temperature sensing application. © 1989-2012 IEEE.
Number of references: 14
Main heading: Michelson interferometers
Controlled terms: Single mode fibers - Thermal expansion - Temperature sensors - Temperature
Uncontrolled terms: Core fibre - External temperature - High sensitivity - Interference - Low temperature sensing - Lows-temperatures - Michelson's interferometer - Multi-mode interference - Sensitivity - Seven-core fiber
Classification code: 641.1 Thermodynamics - 741.1.2 Fiber Optics - 941.3 Optical Instruments - 944.5 Temperature Measuring Instruments - 951 Materials Science
Numerical data indexing: Percentage 5.00E+00%, Size -7.75E-11m
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5. Application of laser-induced breakdown spectroscopy (LIBS) in environmental monitoring

Accession number: 20212210419854
Authors: Zhang, Ying (1); Zhang, Tianlong (1); Li, Hua (1, 2)
Author affiliation: (1) Key Laboratory of Synthetic and Natural Functional Molecule of the Ministry of Education, College of Chemistry & Material Science, Northwest University, Xian; 710127, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xian; 710065, China
Corresponding authors: Li, Hua(huali@nwu.edu.cn); Zhang, Tianlong(tlzhang@nwu.edu.cn)
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Publication year: 2021
Article number: 106218
Language: English
ISSN: 05848547
CODEN: SAASBH
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In recent years, the situation of global environmental pollution becomes more challenging. Environmental monitoring is essential to timely and accurately reflect the current situations and the trends of environmental quality. Laser-induced breakdown spectroscopy (LIBS) as a prominent analytical technique demonstrates several advantages, such as rapid, real-time, in-situ, and simultaneous detection of multiple elements with simple sample preparation. It has great application potential in the field of environmental analysis. Therefore, it is necessary and important to review the progress of basic research and the application of LIBS technology in the environmental field. The present article reviews the research studies on LIBS analysis for environmental samples in the most recent ten years (2010–2019), and mainly includes basic research (LIBS introduction, signal enhancement, and chemometrics methods in LIBS analysis) and application progress (soil, water, and atmospheric monitoring). It will help readers to better understand the current research status of the LIBS technique in environmental monitoring. © 2021 Elsevier B.V.
Number of references: 152
Main heading: Spectrum analysis
Controlled terms: Environmental technology - Atomic emission spectroscopy - Laser induced breakdown spectroscopy
Uncontrolled terms: Atmospheric monitoring - Current research status - Environmental analysis - Environmental Monitoring - Environmental pollutions - Environmental quality - Laserinduced breakdown spectroscopy (LIBS) - Simultaneous detection
Classification code: 454 Environmental Engineering - 931.1 Mechanics
DOI: 10.1016/j.sab.2021.106218
Funding Details: Number: WSFRM20190503001, Acronym: -, Sponsor: -; Number: 21605123,21675123,21873076,22073074, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 20JS144, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2011YQ030113, Acronym: -, Sponsor: National Key Scientific Instrument and Equipment Development Projects of China;
Funding text: The authors are grateful for the financial support from the National Natural Science Foundation of China (No. 22073074 , 21873076 , 21675123 , and 21605123), National Major Scientific Instruments and Equipment Development Project of China (No. 2011YQ030113), Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 20JS144), and the key laboratory of well stability and fluid & rock mechanics in oil and gas reservoir of Shaanxi Province, Xi'an Shiyou University (No. WSFRM20190503001).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

6. Research on von bertalanffy model and its application for predicting recoverable reserves and production of oilfield (*Open Access*)

Accession number: 20211510207966
Authors: Liu, Feng (1, 2); Zhou, Ahuan (1); Yu, Linjun (3); Wang, Yue (3); Yang, Fei (1)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an, Shaanxi, China; (2) State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum, Beijing, China; (3) The Twelfth Oil Company, Chang Qing Oilfield, Cnpc, Heshui, Gansu, China
Corresponding author: Liu, Feng(swpuliufeng@xsyu.edu.cn)
Source title: IOP Conference Series: Earth and Environmental Science
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Issue title: 2020 4th International Conference on Energy Material, Chemical Engineering and Mining Engineering - 3. Geological Resources and Mining Engineering
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Conference name: 2020 4th International Conference on Energy Material, Chemical Engineering and Mining Engineering, EMCEME 2020
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Conference location: Qingdao, China
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Publisher: IOP Publishing Ltd
Abstract: Water drive type curves are simple, convenient and practical in reservoir engineering, which is widely used in reservoir production performance analysis. However, the commonly used water drive type curve can only draw one curve between water cut and recoverable reserves recovery degree, which greatly limits the application range of water drive curve. At the same time, the fitting of straight line section of water drive type curve is often affected by artificial selection, and the error is large. In order to better describe and reflect the rising law of water cut in different type reservoirs, the new water drive type curve is established, and the relationships between water cut and cumulative production, water cut and recovery degree of recoverable reserves are derived. Through MATLAB software programming and multi parameter fitting method, the parameters in the new water drive type curve can be easily calculated. The f w-R $_*$ curve shape of the new model includes convex curve, concave curve and S-shape curve. The new water drive type curve is applied to two actual reservoirs. The new curve fits well with the low water cut stage of the Baolang oilfield, and the error is small, which can be used to predict the future production performance of the oilfield. At the same time, the new water drive type curve is consistent with the change trend of the whole production stage of the Saertu oilfield, and the error is small, too. which can be used for the prediction of the whole production period and high water cut stage of the reservoir. The new model expands the application range of water drive type curve and provides reference for production performance prediction of other similar oilfields. © Published under licence by IOP Publishing Ltd.
Number of references: 19
Main heading: Errors
Controlled terms: Oil field development - Forecasting - MATLAB - Proven reserves - Curve fitting - Recovery
Uncontrolled terms: Application range - Artificial selection - Cumulative production - Multi-parameter fitting - Production performance - Production performance prediction - Recoverable reserves - Reservoir engineering
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 723.5 Computer Applications - 921 Mathematics - 921.6 Numerical Methods
DOI: 10.1088/1755-1315/692/4/042029
Funding Details: Number: PRP/open-1708, Acronym: -, Sponsor: -; Number: 51804253, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was financially supported by the National Natural Science Foundation of China (Grant No. 51804253), Open project of State Key Laboratory of oil and gas resources and exploration(PRP/open-1708).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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7. Strain Sensing Performance of Material Packaged Fiber Bragg Grating in Wide Temperature Range

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Title of translation:
Authors: Feng, Dequan (1, 2); Luo, Xiaodong (2); Fan, Wei (1, 2); Zhu, Baohui (3); Qiao, Xueguang (1)
Author affiliation: (1) School of Physics, Northwest University, Xi'an; 710127, China; (2) Key Laboratory of Photoelectricity Gas-Oil Logging and Detecting, Ministry of Education, Xi'an Shiyou University, Xi'an; 710065, China; (3) Ningxia-Horizontal Titanium Industry Co., Ltd., Shizuishan; 753000, China
Corresponding authors: Feng, Dequan(dqfeng@xsyu.edu.cn); Feng, Dequan(dqfeng@xsyu.edu.cn); Qiao, Xueguang(xgqiao@nwu.edu.cn)
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Volume: 41

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Publication year: 2021
Article number: 2106004
Language: Chinese
ISSN: 02532239
CODEN: GUXUDC
Document type: Journal article (JA)
Publisher: Chinese Optical Society
Abstract: Aiming at the issue of strain of elastic packaging materials for fiber Bragg grating (FBG) sensors used in high-temperature oil and gas wells in a wide temperature range, austenitic stainless steel and trial-produced niobium-based constant-elastic alloys are designed and manufactured into elastic strain elements, and the FBGs are pasted on them for packaging to make tension sensors respectively. The strain sensing performance of the two materials at 30250 is investigated and compared by applying tension to the sensors at different temperatures. The results show that linearity of the tensile response of the two alloy materials at different temperatures is better than 0.999; however, as temperature increases, the tensile response sensitivity decreases, repeatability decreases, and hysteresis increases. Temperature affects the strain sensing performance of the elastic material; in the temperature range of 30250 , the sensor packaged using the trial-produced niobium-based constant-elastic alloy is superior than the sensor packaged using the austenitic stainless steel material in terms of repeatability, hysteresis, linearity, and sensitivity stability. Thus, the trail-produced niobium-based constant-elastic alloy can be used as an elastic packaging material for FBG sensors in a wide temperature range. © 2021, Chinese Lasers Press. All right reserved.
Number of references: 23
Main heading: Fiber Bragg gratings
Controlled terms: Austenitic stainless steel - Hysteresis - Fiber optic sensors - Packaging materials - Elasticity - Niobium alloys - Strain
Uncontrolled terms: Constant elastic alloys - Elastic materials - Fiber Bragg Grating Sensors - Fiber-optics - Highest temperature - Niobium based alloy - Sensing performance - Strain sensing - Tensile response - Wide temperature ranges
Classification code: 545.3 Steel - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 694.2 Packaging Materials - 741.1.2 Fiber Optics - 951 Materials Science - 961 Systems Science
DOI: 10.3788/AOS202141.2106004
Compendex references: YES
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8. Synthesis of alkylbenzenesulfonate and its behavior as flow improver in crude oil

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Authors: Chen, Gang (1, 2); Zhou, Zhichao (1); Shi, Xiaodan (1); Zhang, Xiaolong (2); Dong, Sanbao (1); Zhang, Jie (1)
Author affiliation: (1) Shaanxi Province Key Laboratory of Environmental Pollution Control and Reservoir Protection Technology of Oilfields, Xi'an Shiyou University, Xi'an, China; (2) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing, China
Corresponding author: Chen, Gang(gangchen@xsyu.edu.cn)
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Publication year: 2021
Article number: 119644
Language: English
ISSN: 00162361
CODEN: FUELAC
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Publisher: Elsevier Ltd
Abstract: Small molecule flow improver for heavy oil recovery has attracted great attention in oilfield chemistry. In this study, 24 alkylbenzenesulfonates were synthesized and evaluated as crude oil flow improvers. The results show that all of the alkylbenzenesulfonates were effective, the chromium alkylbenzenesulfonate (CrDBS) and zinc alkylbenzenesulfonate (ZnDBS) were found to have the best performance with the viscosity reduction rate of higher than 90%. Besides, the CrDBS and ZnDBS can depress the pour point of the crude oil sample by 21.0 °C and 16.0

°C, respectively. The co-crystallization of alkylbenzenesulfonate with the saturated hydrocarbons in the crude oil could disorder the wax crystals and depress the pour point. In addition, DSC was used to reveal the mechanism of viscosity reduction and pour point depressing by alkylbenzenesulfonates. The flow improver can disturb the formation of hydrogen bonds and the π–π interaction bonds among the polycyclic aromatic hydrocarbons and the resin macromolecules. Besides, the field test using ZnDBS confirmed its good performance and promising application potential in enhancing the heavy oil recovery. © 2020 Elsevier Ltd
Number of references: 25
Main heading: Crude oil
Controlled terms: Viscosity - Heavy oil production - Hydrogen bonds - Efficiency - Polycyclic aromatic hydrocarbons
Uncontrolled terms: Alkylbenzenesulfonate - Co-crystallizations - Flow improvers - Heavy oil recovery - Pi interactions - Saturated hydrocarbons - Small molecules - Viscosity reduction
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 631.1 Fluid Flow, General - 801.4 Physical Chemistry - 804.1 Organic Compounds - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 9.00e+01%, Temperature 2.89e+02K, Temperature 2.94e+02K
DOI: 10.1016/j.fuel.2020.119644
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9. Hyperspectral Abnormal Target Detection Based on Extended Multi-attribute Profile and Fast Local RX Algorithm

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Title of translation: RX
Authors: A, Ruhan (1); Yuan, Xiaobin (2); Mu, Xiaodong (1); Wang, Jingyi (3)
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Corresponding author: Mu, Xiaodong(Mu_403@163.com)
Source title: Guangzi Xuebao/Acta Photonica Sinica
Abbreviated source title: Guangzi Xuebao
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Publication year: 2021
Pages: 289-299
Language: Chinese
ISSN: 10044213
CODEN: GUXUED
Document type: Journal article (JA)
Publisher: Chinese Optical Society
Abstract: In order to further improve the speed and accuracy of hyperspectral abnormal target detection, a fast anomaly target detection method based on extended multi-attribute profiles and improved Reed-Xiaoli is proposed. Extended multi-attribute Profiles are extracted from the original hyperspectral images by mathematical morphological transformations. Moreover, a novel fast local Reed-Xiao algorithm is also proposed. Iteratively update inverse matrix of covariance using matrix inverse lemma, thereby reducing the computational complexity of the Mahalanobis distance. The combination of extended multi-attribute profiles and fast local Reed-Xiaoli detector effectively utilizes the spectral information and spatial information of hyperspectral images, it greatly improves the detection accuracy and reduce the running time. Experimental results on three real data sets show the AUC value of the algorithm in this paper is 0.996 7, 0.985 6 and 0.981 6 respectively. The operation time is 21.218 1 s, 15.192 8 s and 32.337 9 s respectively. The

proposed method has obvious advantages in detection accuracy and speed, and has good practical value. © 2021, Science Press. All right reserved.
Number of references: 22
Main heading: Anomaly detection
Controlled terms: Inverse problems - Spectroscopy - Covariance matrix - Iterative methods - Mathematical transformations - Image enhancement - Mathematical morphology
Uncontrolled terms: Abnormal target detections - Anomaly detection - Detection accuracy - Extended multi-attribute profile - Fast local RX - HyperSpectral - Matrix inverse - Matrix inverse lemma - Multi-attributes - Reed-xiaoli
Classification code: 921 Mathematics - 921.3 Mathematical Transformations - 921.6 Numerical Methods
Numerical data indexing: Time 1.00E00s, Time 8.00E+00s, Time 9.00E+00s
DOI: 10.3788/gzxb20215009.0910002
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Funding text: itemNational Natural Science Foundation of ChinaNos.4130148062002286
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

10. Hydrodenitrogenation of Quinoline with high selectivity to aromatics over α–MoC1-x

Accession number: 20214711183924
Authors: Qiu, Zegang (1); Wang, Yuanzhe (1); Li, Zhiqin (1); Cao, Yueling (2, 3); Li, Qiao (1)
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Corresponding author: Li, Zhiqin(lizhiqin@xsyu.edu.cn)
Source title: Molecular Catalysis
Abbreviated source title: Mol. Cat.
Volume: 516
Issue date: November 2021
Publication year: 2021
Article number: 112002
Language: English
ISSN: 24688231
CODEN: MCOADH
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: The hydrodenitrogenation (HDN) with a low hydrogen consumption in the hydroprocessing of crude oils derived from carbon resources is still a challenge. Here, a molybdenum carbide (α–MoC1-x) catalyst with a high selectivity to aromatic compounds was reported, using the HDN of quinoline as a model reaction. This process was characterized by low hydrogen consumption. The prepared α–MoC1-x had a much larger specific surface area (107.6 m2•g-1) than β–Mo2C (6.8 m2•g-1). Under the catalysis of α–MoC1-x, the conversion and the denitrification rate of quinoline could both reach 99%, and the highest selectivity of the total aromatics reached 48.5% at 360 °C, which was 10.7% higher than that on β–Mo2C. The cleavage of C[sbnd]C bonds of side chain of Propylbenzene (PB) and Propylcyclohexane (PCH) occurred, producing several unexpected products with unusual high selectivity. A new possible reaction network of quinoline hydrodenitrogenation was drawn, and the reaction mechanism was discussed based on the experiments and DFT (density functional theory) calculations. © 2021 Elsevier B.V.
Number of references: 51
Main heading: Density functional theory
Controlled terms: Hydrogen - Carbides - Catalyst selectivity - Molybdenum compounds - Aromatization
Uncontrolled terms: Aromatic selectivity - Carbon resources - High selectivity - Hydrodenitrogenation - Hydrogen consumption - Hydroprocessing - Quinoline -]+ catalyst - $_{A}$–MoC1-x - $_{B}$–mo2C
Classification code: 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 812.1 Ceramics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
Numerical data indexing: Percentage 1.07E+01%, Percentage 4.85E+01%, Percentage 9.90E+01%, Size 1.076E+02m, Size 6.80E+00m, Temperature 6.33E+02K
DOI: 10.1016/j.mcat.2021.112002

Funding Details: Number: 2019A1515110507, Acronym: -, Sponsor: -; Number: YCS21111010, Acronym: -, Sponsor: -; Number: 21878243,21908176,22002120, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: Supported by the National Natural Science Foundation of China (No. 21878243 , No. 21908176 and No. 22002120) , the Innovation and practice ability training project for postgraduates of Xi'an Shiyou University (YCS21111010) and the Guangdong Basic and Applied Basic Research Foundation (No. 2019A1515110507).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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11. Sectional water fraction measurement for gas-water two-phase flow containing a conductive water phase utilizing capacitance sensor

Accession number: 20211510200323
Authors: Tang, Kaihao (1); Hu, Hongli (1); Li, Lin (1); Wang, Xiaoxin (2)
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Source title: Measurement Science and Technology
Abbreviated source title: Meas. Sci. Technol.
Volume: 32
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Publication year: 2021
Article number: 055104
Language: English
ISSN: 09570233
E-ISSN: 13616501
CODEN: MSTCEP
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: By applying an electrical capacitance sensor to sectional water fraction measurement for gas-water (salinity) two-phase flow, this paper investigates the effect of a medium's conductivity on the measurement of capacitance sensors and its elimination. Firstly, the mechanism of how a medium's conductivity influences the capacitance measurement of a capacitance sensor is analyzed by combining a physical model of the sensor with its conditioning circuit. The theoretical analysis indicates that the applied exciting frequency is a key factor influencing the conductivity effect; the effect can be restrained by increasing the excitation frequency. Then, an exciting frequency optimization rule is proposed accordingly. In addition, sensor configuration and geometry optimization (based on finite element method simulations) are discussed to achieve better performance. Dynamic and static calibration experiments are carried out for stratified gas-liquid (salinity) two-phase flow for the purpose of validating the proposed method. The experimental results confirm the effectiveness of the proposed method. This work is constructive to the design of capacitive sensing technologies applied to conductive objects, and offers insights into the structural design and optimization of capacitance sensors. © 2021 IOP Publishing Ltd.
Number of references: 26
Main heading: Two phase flow
Controlled terms: Capacitance measurement - Capacitive sensors - Structural optimization - Capacitance - Structural design
Uncontrolled terms: Capacitance sensors - Conditioning circuit - Design and optimization - Electrical capacitance sensor - Excitation frequency - Finite element method simulation - Geometry optimization - Sensor configurations
Classification code: 408.1 Structural Design, General - 631.1 Fluid Flow, General - 701.1 Electricity: Basic Concepts and Phenomena - 732 Control Devices - 921.5 Optimization Techniques - 942.2 Electric Variables Measurements
DOI: 10.1088/1361-6501/abea3e
Funding Details: Number: 51777151, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-822, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: xzy022019046, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work is supported by the National Natural Science Foundation of China (No. 51777151), the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2019JQ-822), and the Fundamental Research Funds for the Central Universities (No. xzy022019046).
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village
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12. Desulfurization optimization of reforming catalytic dry gas using radial basis artificial neural network based on PSO algorithm

Accession number: 20212610570639
Title of translation: PSO
Authors: Fan, Zheng (1); Tian, Runzhi (1); Lin, Liang (2); Han, Yanzhong (3); Guo, Yang (3); Dou, Longlong (3); Jing, Genhui (1); Tyoor, Agi Damian (1)
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Corresponding author: Fan, Zheng(fanzheng@xsyu.edu.cn)
Source title: Huagong Jinzhan/Chemical Industry and Engineering Progress
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Issue: 6
Issue date: June 5, 2021
Publication year: 2021
Pages: 3107-3118
Language: Chinese
ISSN: 10006613
Document type: Journal article (JA)
Publisher: Materials China
Abstract: To address the issues of excessive energy consumption caused by frequent feed fluctuation and retarded optimization response of desulfurization for reforming catalytic dry gas process, the flowsheet simulation was conducted through the Aspen HYSYS V11 package using Li-Mather physicochemical property calculation method. Screening the effective factors that had a significant influence on the target value was adopted according to Plackett-Burman design. The radial basis artificial neural network based on the PSO algorithm was utilized to train, validate, and test the prediction model. On the premise of satisfying the constraint of hydrogen sulfide content in purified dry gas, the deep optimization was carried out to minimize the energy consumption of the system. The results show that the flowrate and hydrogen sulfide content of reforming catalytic dry gas, the piperazine and N-methyl diethanolamine content in lean solution, circulation quantity of amine solution, the bottom temperature of T-3001, and the outlet temperature of a lean solution of E-3003 play a crucial role in energy consumption of the system. The prediction model of the 7-16-1 radial basis artificial neural network where the aforementioned factors were taken as the input signal and the system energy consumption as the network output evolves 4182 epochs. The mean square errors of training samples, verification samples, and test samples are 5.08×10-6, 7.78×10-6, and 9.56×10-6 respectively, which are less than the allowable convergence error limit of 10-5. A good correlation is presented as the determination coefficients reach 0.981, 0.975, and 0.969. When the radial basis artificial neural network with the PSO algorithm is used to optimize the energy consumption of the desulfurization system for reforming catalytic dry gas, the system energy consumption is reduced to be merely 0.0649kgoe/h after 3198particle evolution iterations, which is 8.98% lower than 0.0713kgoe/h before optimization, and the energy saving effect is significant. © 2021, Chemical Industry Press Co., Ltd. All right reserved.
Number of references: 43
Main heading: Desulfurization
Controlled terms: Neural networks - Sulfur determination - Gases - Hydrogen sulfide - Energy conservation - Physicochemical properties - Energy utilization - Particle swarm optimization (PSO) - Catalytic reforming - Mean square error - Air purification
Uncontrolled terms: Determination coefficients - Energy-saving effect - Evolution iteration - Flow sheet simulation - Methyldiethanolamine - Plackett-Burman designs - System energy consumption - Verification samples
Classification code: 451.2 Air Pollution Control - 525.2 Energy Conservation - 525.3 Energy Utilization - 643 Space Heating, Ventilation and Air Conditioning - 723 Computer Software, Data Handling and Applications - 801 Chemistry - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 921.5 Optimization Techniques - 922.2 Mathematical Statistics
Numerical data indexing: Percentage 8.98e+00%
DOI: 10.16085/j.issn.1000-6613.2020-1426
Compendex references: YES
Database: Compendex

Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

13. Development of Intelligent Planning & Integrated Office Management System for Drilling Operations in South Azadagan (*Open Access*)

Accession number: 20212110392499
Authors: Liu, Zhikun (1); Li, Aixi (2); Li, Jihui (3); Bai, Mingna (4)
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Corresponding author: Liu, Zhikun(lzk12431@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1894
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012037
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: Due to the distance limitation between the drilling department in Iran and the head office in China, it is necessary to improve the management level of the south Azadagan drilling department in the south of Iran. According to the drilling operation characteristics of Iran south Azadagan department, we design and develop an Intelligent Planning & Integrated Office Management System (IPIOMS) including design management, work report, planning and cost control, operation management, statistical query and logistics support. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Office buildings
Controlled terms: Infill drilling
Uncontrolled terms: Design management - Drilling operation - Intelligent planning - Logistics support - Management systems - Operation management - Planning and cost controls - Statistical queries
Classification code: 402.2 Public Buildings - 511.1 Oil Field Production Operations
DOI: 10.1088/1742-6596/1894/1/012037
Funding Details: Number: 51974248, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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Compilation and indexing terms, Copyright 2023 Elsevier Inc.

14. AgNPs decorated 3D bionic silicon nanograss arrays pattern with high-density hot-spots for SERS sensing via green galvanic displacement without additives (*Open Access*)

Accession number: 20213410813185
Authors: Wang, Li (1); Huang, Jian (1); Su, Mei-Juan (1); Wu, Jin-Di (1); Liu, Weisheng (2)

Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'An Shiyou University, Shaanxi, Xi'an; 710065, China; (2) Key Laboratory of Nonferrous Metals Chemistry and Resources Utilization of Gansu Province, College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou; 730000, China
Corresponding authors: Huang, Jian(jhuang@xsyu.edu.cn); Liu, Weisheng(liuws@lzu.edu.cn)
Source title: RSC Advances
Abbreviated source title: RSC Adv.
Volume: 11
Issue: 44
Issue date: July 29, 2021
Publication year: 2021
Pages: 27152-27159
Language: English
E-ISSN: 20462069
CODEN: RSCACL
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Surface-enhanced Raman scattering (SERS) sensing has always been considered as a kind of high-efficiency analysis technique in different areas. Herein, we report a AgNPs decorated 3D bionic silicon (Si) nanograss SERS substrate with higher sensitivity and specificity by green galvanic displacement. The Si nanograss arrays are directly grown on a Si substrate via catalyst-assisted vapor-liquid-solid (VLS) growth and subsequent plasma interaction. AgNPs were rapidly immobilized on Si nanograss arrays without any organic reagents, and avoiding the interference signal of additives. The AgNPs decorated 3D bionic silicon nanograss arrays not only possess a larger specific surface area (loading more reporter molecules), but also provide a potential distribution and arrangement for plentiful hot spots. Using Rhodamine 6G (R6G) as a probe molecule, the prepared SERS substrates exhibited great potential for high-sensitivity SERS sensing, and pushed the limit of detection (LOD) down to 0.1 pM. A higher Raman analytical enhancement factor (AEF, 3.3 × 107) was obtained, which was two magnitudes higher than our previous Ag micro-nano structures. Additionally, the practicality and reliability of our 3D bionic SERS substrates were confirmed by quantitative analysis of the spiked Sudan I in environmental water, with a wide linear range (from 10-10 M to 10-6 M) and low detection limit (0.1 nM). © 2021 The Royal Society of Chemistry.
Number of references: 40
Main heading: Surface scattering
Controlled terms: Nanostructures - Reliability analysis - Substrates - Additives - Silicon - Raman scattering - Molecules - Bionics
Uncontrolled terms: Environmental water - Galvanic displacement - Low detection limit - Micro-nano structures - Potential distributions - Sensitivity and specificity - Surface enhanced Raman Scattering (SERS) - Vapor-liquid-solid growth
Classification code: 461.1 Biomedical Engineering - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 741.1 Light/Optics - 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 931 Classical Physics; Quantum Theory; Relativity - 931.3 Atomic and Molecular Physics - 933 Solid State Physics
DOI: 10.1039/d1ra04874k
Funding Details: Number: YCS20211022, Acronym: -, Sponsor: -; Number: 21JK0835, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2019JQ-490, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This research was funded by the Natural Science Basic Research Program of Shaanxi (No. 2019JQ-490), Scientic Research Program Funded by Shaanxi Provincial Education Department (No. 21JK0835), and the Innovation and Practice Ability Training Project for Postgraduates of Xi'an Shiyou University (No. YCS20211022).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

15. Geochemical characteristics and sedimentary setting of chang 9 shale in the Upper Triassic Yanchang Formation of southeastern Ordos Basin (NW China)

Accession number: 20204709512965
Authors: Chen, Yuhang (1, 2, 3, 4); Liu, Shehu (5); Zhu, Zengwu (5); Wang, Zhe (5); Sun, Xiaoguang (6); Xu, Tong (6)
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of Oceanology, Chinese Academy of Sciences, Guangzhou; 510301, China; (4) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an Shiyou University, Shaanxi, Xi#an; 710065, China; (5) Shaanxi Institute of Geological Survey, Xi#an; 710054, China; (6) PetroChina Coalbed Methane Company Limited Xinzhou Company, Taiyuan; 030000, China
Corresponding author: Chen, Yuhang(cyh@xsyu.edu.cn)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 196
Issue date: January 2021
Publication year: 2021
Article number: 108081
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In addition to the organic-rich shale in the Chang 7 Member (Ch7 shale) of the Ordos Basin, the shale hosted in the Chang 9 Member (Ch9 shale) is another source rock and potential unconventional target. However, there is a general lack of consensus on the features and potential of the Ch9 shale. In order to determine the potential of the Ch9 shale, this study analyzes its paleoenvironment and sedimentary setting based on the integrated analysis of geochemistry and sedimentary facies. A comparison of geochemical features between the Ch9 shale and the organic-rich Ch7 shale is made to evaluate the factors controlling organic matter (OM) enrichment of the Ch9 shale. The results show that the Ch9 shale has good hydrocarbon potential, and terrestrial OM is important component of the OM in the Ch9 shale. The Ch9 shale was deposited in climatic transition period from cold and dry to warm and humid, when the water body was suboxic-anoxic and freshwater. The relatively cold and dry climate and suboxic-anoxic water condition in the Ch9 period could not provide the same excellent conditions for OM enrichment as that in the Ch7 period. The Ch9 shale is composed of sediments mixed with felsic rocks that originated from continental island arcs and active continental margins. The active tectonic setting resulted in event deposition (e.g. turbidity flows and hydrothermal fluid activity) during the deposition of Ch9 shale. The input of terrestrial OM carried by turbidity flows also promoted OM enrichment, however, the very high depositional rates caused by turbidity flows diluted the OM, which probably offset the effect of hydrothermal on OM enrichment. Our results are helpful to revealing the source potential of the Ch9 shale, providing a theoretical basis for the shale oil and gas exploration in the Ordos Basin. © 2020 Elsevier B.V.
Number of references: 103
Main heading: Deposition
Controlled terms: Biogeochemistry - Petroleum prospecting - Turbidity - Organic compounds - Sedimentology
Uncontrolled terms: Active tectonic settings - Geochemical characteristic - Geochemical features - Hydrocarbon potential - Hydrothermal fluids - Integrated analysis - Oil and gas exploration - Organic-rich shales
Classification code: 481.1 Geology - 481.2 Geochemistry - 512.1.2 Petroleum Deposits : Development Operations - 741.1 Light/Optics - 801.2 Biochemistry - 802.3 Chemical Operations - 804.1 Organic Compounds
DOI: 10.1016/j.petrol.2020.108081
Funding Details: Number: 2019QNKYCXTD05, Acronym: -, Sponsor: -; Number: OMG18-12, Acronym: -, Sponsor: -; Number: 20150301, Acronym: -, Sponsor: -; Number: 41802128, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-828, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: MGE2020KG10, Acronym: -, Sponsor: Key Laboratory of Marine Geology and Environment;
Funding text: The authors kindly and appreciatively thank the associate editor Prof. Barry Jay Katz for his constructive comments, which significantly improved the manuscript. This study was financially supported by the National Natural Science Foundation of China (Grant No. 41802128), Key Laboratory of Ocean and Marginal Sea Geology, Chinese Academy of Sciences (Grant No. OMG18-12), Open Fund of the Key Laboratory of Marine Geology and Environment, Chinese Academy of Sciences (Grant No. MGE2020KG10), the Natural Science Foundation of Shaanxi Province of China (Grant No. 2019JQ-828), Clastic Sedimentology and Reservoir Evaluation (Grant No. 2019QNKYCXTD05), and Public Geological Project in Shaanxi Province (Grant No. 20150301).The authors kindly and appreciatively thank the associate editor Prof. Barry Jay Katz for his constructive comments, which significantly improved the manuscript. This study was financially supported by the National Natural Science Foundation of China (Grant No. 41802128), Key Laboratory of Ocean and Marginal Sea Geology, Chinese Academy of Sciences (Grant No. OMG18-12), Open Fund of the Key Laboratory of Marine Geology and Environment, Chinese Academy of Sciences (Grant No. MGE2020KG10), the Natural Science Foundation of Shaanxi Province of China (Grant No. 2019JQ-828), Clastic Sedimentology and Reservoir Evaluation (Grant No. 2019QNKYCXTD05), and Public Geological Project in Shaanxi Province (Grant No. 20150301).
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16. Magnetism-mechanics Performance of Magnetically Controlled Shape Memory Alloy and Application for Active Control System

Accession number: 20220711634440
Authors: Weng, Guangyuan (1); DIng, Junfeng (1); Wu, Yajun (2); Liu, Yang (3)
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Source title: 2021 7th International Conference on Hydraulic and Civil Engineering and Smart Water Conservancy and Intelligent Disaster Reduction Forum, ICHCE and SWIDR 2021
Abbreviated source title: Int. Conf. Hydraul. Civ. Eng. Smart Water Conserv. Intell. Disaster Reduct. Forum, ICHCE SWIDR
Part number: 1 of 1
Issue title: 2021 7th International Conference on Hydraulic and Civil Engineering and Smart Water Conservancy and Intelligent Disaster Reduction Forum, ICHCE and SWIDR 2021
Issue date: 2021
Publication year: 2021
Pages: 478-486
Language: English
ISBN-13: 9781665408653
Document type: Conference article (CA)
Conference name: 7th International Conference on Hydraulic and Civil Engineering and Smart Water Conservancy and Intelligent Disaster Reduction Forum, ICHCE and SWIDR 2021
Conference date: November 6, 2021 - November 8, 2021
Conference location: Nanjing, China
Conference code: 176071
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: To control the dynamic stability of light steel structure, magnetism-mechanics performance of magnetically controlled shape memory alloy (MSMA) was studied, the MSMA actuator and MSMA active control system was developed. The material properties of MSMA related to magnetism and mechanics was studied, at the same time, the influence of the Ni-Mn-Ga contained in MSMA on the magnetism-mechanics properties was analysed, Ni53Mn25Ga22 was selected to build the design theoretical basis of MSMA actuator. Taking three MSMA rods with a size of 4x8x45mm as the core element, a new type of actuator was developed, and the corresponding magnetism-mechanics performance test was carried out. The key factors such as magnetic field, de-formation rate, preloading, active control force, etc. were determined, as well as the mathematical models with the changes of parameters were established. The controlled object (steel truss model structure), MSMA actuator, control algorithm, data acquisition system, etc. constitute the MSMA active control system. Two MSMA actuators are installed on the steel truss model structure, under the excitation of sine wave, the dynamic response of the steel truss model structure with the MSMA active control system was tested, and the results was compared with uncontrolled; The results show that the acceleration response of the steel truss model structure equipped with the MSMA active control system decreased by about 25%, and the displacement response decreased by about 20%. The active control system with MSMA actuator as the core component can better realize the dynamic stability control of steel structure. © 2021 IEEE.
Number of references: 28
Main heading: Manganese alloys
Controlled terms: Actuators - Control systems - Data acquisition - Dynamics - Magnetism - Shape-memory alloy - Steel structures - Ternary alloys
Uncontrolled terms: Active control systems - Active vibration controls - Component - Magnetically controled shape memory alloy actuator - Magnetically controlled shape memory alloy - Shape memory alloy actuators - Steel truss - Steel truss structures - Truss model
Classification code: 408.2 Structural Members and Shapes - 542.3 Titanium and Alloys - 543.2 Manganese and Alloys - 545.3 Steel - 701.2 Magnetism: Basic Concepts and Phenomena - 723.2 Data Processing and Image Processing - 731.1 Control Systems - 732.1 Control Equipment
Numerical data indexing: Percentage 2.00E+01%, Percentage 2.50E+01%
DOI: 10.1109/ICHCESWIDR54323.2021.9656187
Funding Details: Number: WSFRM20200102001, Acronym: -, Sponsor: -;
Funding text: the Key Laboratory of Well Stability and Fluid and Rock Mechanics in Oil and Gas Reservoir of Shaanxi Province, Xi'an Shiyou University (No. WSFRM20200102001).

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17. A review on slip boundary conditions at the nanoscale: recent development and applications (*Open Access*)

Accession number: 20215111353895
Authors: Wang, Ruifei (1); Chai, Jin (1); Luo, Bobo (2); Liu, Xiong (1); Zhang, Jianting (1); Wu, Min (1); Wei, Mingdan (1); Ma, Zhuanyue (1)
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Source title: Beilstein Journal of Nanotechnology
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Pages: 1237-1251
Language: English
E-ISSN: 21904286
Document type: Journal article (JA)
Publisher: Beilstein-Institut Zur Forderung der Chemischen Wissenschaften
Abstract: The slip boundary condition for nanoflows is a key component of nanohydrodynamics theory, and can play a significant role in the design and fabrication of nanofluidic devices. In this review, focused on the slip boundary conditions for nanoconfined liquid flows, we firstly summarize some basic concepts about slip length including its definition and categories. Then, the effects of different interfacial properties on slip length are analyzed. On strong hydrophilic surfaces, a negative slip length exists and varies with the external driving force. In addition, depending on whether there is a true slip length, the amplitude of surface roughness has different influences on the effective slip length. The composition of surface textures, including isotropic and anisotropic textures, can also affect the effective slip length. Finally, potential applications of nanofluidics with a tunable slip length are discussed and future directions related to slip boundary conditions for nanoscale flow systems are addressed. © 2021 Wang et al.; licensee Beilstein-Institut. License and terms: see end of document. All Rights Reserved.
Number of references: 127
Main heading: Boundary conditions
Controlled terms: Nanofluidics - Surface roughness - Textures
Uncontrolled terms: Development and applications - Effective slip lengths - Interfacial property - Liquid flow - Nano scale - Nanoflows - Nanofluidic device - Slip boundary conditions - Slip length - Unconventional reservoirs
Classification code: 632.5.2 Nanofluidics - 761 Nanotechnology - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.3762/bjnano.12.91
Funding Details: Number: 18JS084, Acronym: -, Sponsor: -; Number: 20180703, Acronym: -, Sponsor: -; Number: 51834005, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: JYCX_JG10_2018, Acronym: NEPU, Sponsor: Northeast Petroleum University;
Funding text: The authors are grateful for the financial support from the Key projects of Shaanxi Provincial Department of Education (Grant No.18JS084), Young Talent fund of the University Association for Science and Technology in Shanxi, China (Grant No.20180703), the Key project of National Natural Science Foundation of China (Grant No.51834005) and the Research project of graduate education and teaching reform of Northeast Petroleum University (Grant No. JYCX_JG10_2018).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

18. Electromagnetic Mutual Inductance Coupling Model of Wireless Power Transfer in Oil-gas downhole (*Open Access*)

Accession number: 20211010028709
Authors: Wang, Yuelong (1); Ding, Yingzhi (2); Bi, Lingzhi (1); Yang, JingYi (3); Li, Yizhen (4)
Author affiliation: (1) School of Electronic Engineering, Xi'An Petroleum University, Xi'an, Shanxi, China; (2) School of Electronic Engineering, Xi'An Petroleum University, Jinan, Shandong, China; (3) China Petrochemical Corporation, Xi'an, Shanxi, China; (4) School of Electronic Engineering, Xi'An Petroleum University, Baoji, Shanxi, China
Corresponding author: Ding, Yingzhi(dyz18709261907@163.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1738
Part number: 1 of 1
Issue: 1
Issue title: 2020 2nd International Conference on Electronics and Communication, Network and Computer Technology, ECNCT 2020
Issue date: January 15, 2021
Publication year: 2021
Article number: 012010
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 2nd International Conference on Electronics and Communication, Network and Computer Technology, ECNCT 2020
Conference date: October 23, 2020 - October 25, 2020
Conference location: Chengdu, China
Conference code: 167311
Publisher: IOP Publishing Ltd
Abstract: According to the wireless power transfer system (WPT) in oil-gas downhole, the structure of the WPT device suitable for the simultaneous existence of oil-water medium in high-temperature and high-pressure environment is put forward by using the principle of electromagnetic induction. Through the analysis of magnetic circuit, the electromagnetic mutual inductance coupling model is established, and the main factors affecting the transmission efficiency are obtained. Based on the model, the system is simulated and verified by experiments, in order to further improve the efficiency of power transfer system. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Energy transfer
Controlled terms: Efficiency - Inductance - Inductive power transmission
Uncontrolled terms: Downholes - High temperature and high pressure - Mutual inductance couplings - Oil gas - Oil water - Power transfer systems - Transmission efficiency - Wireless power
Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 706.1.1 Electric Power Transmission - 913.1 Production Engineering
DOI: 10.1088/1742-6596/1738/1/012010
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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19. A New Growth Curve for Predicting Production Performance of Water-Flooding Oilfields (*Open Access*)

Accession number: 20214311059251
Authors: Liu, Feng (1, 2); Liu, Yancheng (3); Guo, Xiao (2); Yang, Fei (1); Zhou, Ahuan (1); Li, Chuanliang (2)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China; (2) State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation, Southwest Petroleum University, Sichuan, Chengdu; 610500, China; (3) China United Coalbed Methane Corporation, Beijing; 100022, China
Corresponding author: Liu, Feng(swpuliufeng@xsyu.edu.cn)
Source title: Mathematical Problems in Engineering
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Volume: 2021
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Article number: 7787850
Language: English
ISSN: 1024123X
E-ISSN: 15635147
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Oil production and water cut prediction is one of the most important research contents of reservoir production performance analysis. The growth curve method has the advantages of the general water drive curve method and the combined solution model method with fewer parameters and simple and fast calculation process and so it has been widely used in well production prediction. Based on the analysis of 4W and 4Y4 model growth curves, a new generalized growth curve of the well production performance is proposed. The new model can forecast cumulative oil production, annual oil production, and water cut at different oilfield development periods. A MATLAB program was developed to derive the parameters in the new model. The built model was applied to the production data of the Samattalol oilfield and Daqing oilfield. The predicted cumulative oil production, annual oil production, and water cut are all close to the actual production data, and satisfactory results are obtained, which demonstrates the practicability and reliability of the new model. © 2021 Feng Liu et al.
Number of references: 24
Main heading: MATLAB
Controlled terms: Oil field development - Forecasting - Offshore oil well production - Digital storage
Uncontrolled terms: Cumulative oil production - Curve method - Floodings - Growth curves - Oil-production - Oil/water - Production data - Production performance - Water cuts - Well production
Classification code: 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 722.1 Data Storage, Equipment and Techniques - 723.5 Computer Applications - 921 Mathematics
Numerical data indexing: Power 4.00E+00W
DOI: 10.1155/2021/7787850
Funding Details: Number: 51804253,51874239,51974253, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: PLN201713, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation;
Funding text: The authors acknowledge financial assistance from the National Natural Science Foundation of China (Grant Nos. 51804253, 51974253, and 51874239) and Open Fund of State Key Laboratory of Oil & Gas Reservoir Geology and Exploitation (PLN201713). The authors are very grateful to Professor XL Ma for his valuable advice and assistance.
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

20. Enhanced Reliability of Ni-Fe Alloys Supported SOFCs with Ex-Situ Sintered La0.8Sr0.2MnO3-#Coated Ba0.5Sr0.5Co0.8Fe0.2O3-#Cathode

Accession number: 20211610234141
Authors: Li, Kai (1); Jin, Yafeng (1); Gao, Wenming (1); Xue, Shoucai (1, 2); Zhang, Ming (2)
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Source title: Journal of the Electrochemical Society
Abbreviated source title: J Electrochem Soc
Volume: 168
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Publication year: 2021
Article number: 034516
Language: English
ISSN: 00134651
E-ISSN: 19457111
CODEN: JESOAN
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd

Abstract: A critical issue for massive production of metal-supported solid oxide fuel cell is cathode processing due to the contradicting of the metal support and the cathode with regard to the sintering atmosphere. Herein, LSM-BSCF (La0.8Sr0.2MnO3-δ coated Ba0.5Sr0.5Co0.8Fe0.2O3-δ) cathodes on Ni-Fe alloys supported SOFCs (NF-SOFCs) are fabricated by an ex situ sintering approach and electrochemical evaluation in humidified H2 fuel. The ex situ sintering of cathodes on NF-SOFCs are performed at 1050 °C in air with metal oxide support consisted of NiO and 10 at% Fe2O3, and then the oxide support is reduced in situ into Ni-Fe alloys during testing. Cross-section microstructure analysis shows clear evidence that each layer is well adhered to each other after reduction and the suitable microstructure of ex situ sintered cathode is observed after sintering at 1050 °C. In the single-cell test, a higher peak power density is achieved for NF-SOFC with ex situ sintered LSM-BSCF in comparison with in situ sintered cells, revealing a beneficial effect of ex situ sintered cathode on cell performance. The durability measurement and post-test analysis confirm the sufficient adherence and mechanical stability between ex situ sintered LSM-BSCF cathode and GDC (Ce0.9Gd0.1O1.95) electrolyte. The successful electrochemical characterizations of NF-SOFCs with ex situ sintered LSM-BSCF cathode confirm the applicability of the novel sintering procedure. © 2021 The Electrochemical Society ("ECS"). Published on behalf of ECS by IOP Publishing Limited.
Number of references: 33
Main heading: Solid oxide fuel cells (SOFC)
Controlled terms: Binary alloys - Solid electrolytes - Durability - Lanthanum alloys - Metals - Hematite - Nickel oxide - Strontium compounds - Cathodes - Gadolinium compounds - Nickel alloys - Sintering - Iron alloys - Manganese alloys - Mechanical stability - Microstructure
Uncontrolled terms: Cross section microstructure - Electrochemical characterizations - Electrochemical evaluations - Metal oxide supports - Metal-supported solid oxide fuel cells - Peak power densities - Sintering atmospheres - Sintering procedures
Classification code: 482.2 Minerals - 543.2 Manganese and Alloys - 545.2 Iron Alloys - 547.2 Rare Earth Metals - 548.2 Nickel Alloys - 702.2 Fuel Cells - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 951 Materials Science
Numerical data indexing: Temperature 1.32e+03K
DOI: 10.1149/1945-7111/abef46
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

21. Ultra-deep Sandstone Rock Mechanics and Their Effects on Hydraulic Fracturing Treatment

Accession number: 20220411504163
Authors: Li, Qinghui (1); Li, Shaoxuan (2); Jiang, Hailong (3); Ren, Lingling (4); Liu, Jiankang (5)
Author affiliation: (1) YuhwaEssen Market Information Consulting Service Institute, Hebei, Shijiazhuang, China; (2) Xidian University, Shanxi, Xi'an, China; (3) College of Mechanical Engineering, Xi'an Shiyou University, Shanxi, Xi'an, China; (4) Petrochina Tarim Oilfield Company, Xinjiang, Korla, China; (5) School of Emergency Science, Xihua University, Sichuan, Chengdu, China
Source title: 55th U.S. Rock Mechanics / Geomechanics Symposium 2021
Abbreviated source title: U.S. Rock Mech. / Geomech. Symp.
Volume: 3
Part number: 3 of 5
Issue title: 55th U.S. Rock Mechanics / Geomechanics Symposium 2021
Issue date: 2021
Publication year: 2021
Report number: ARMA 21-1437
Pages: 161-173
Language: English
ISBN-13: 9781713839125
Document type: Conference article (CA)
Conference name: 55th U.S. Rock Mechanics / Geomechanics Symposium 2021
Conference date: June 18, 2021 - June 25, 2021
Conference location: Houston, Virtual, TX, United states
Conference code: 175961
Publisher: American Rock Mechanics Association (ARMA)
Abstract: Ultra-deep sandstones are significantly different from shallow sandstones. Laboratory rock mechanical experiments were conducted with sandstone samples from various depths. Through deformation and failure

mechanism research under in-situ conditions, influence rules of burial depth on mechanical parameters could be obtained, which would be vital references for ultra-deep sandstone reservoir development. Rock mechanical properties such as uniaxial compressive, triaxial compressive, Brazilian tensile, shear strength, and brittle index were acquired. Variation laws were studied by systematically comparing of uniaxial and triaxial compressive strength, tensile strength, shear strength, internal friction angle, cohesion strength, Young's modulus, Poisson's ratio, brittleness index, fracture amount, and failure modes versus depth. Sandstone strength and mechanical behavior were analyzed with temperature altered. The results showed significant differences between ultra-deep and shallow sandstones on mechanical strength, anti-deformation failure, failure modes, etc. Ultra-deep sandstones behaved with higher strength, lower brittleness, notable difficulty boosting of fracturing treatments. Confining pressure increasing tended to strengthen the majority of rock mechanical parameters. Sandstone strength and brittleness decreased when temperature increasing, ductile characteristics enhanced in this process. Confining pressure, temperature, physical properties, and cementation diagenesis are critical factors that affect ultra-deep sandstone mechanical properties. Alteration of rock mechanical properties had significant influences on initiation and re-orientation of hydraulic fractures, which would cause capacity loss of complex fractures. © 2021 ARMA, American Rock Mechanics Association
Number of references: 42
Main heading: Sandstone
Controlled terms: Compressive strength - Deformation - Fracture mechanics - Rock pressure - Fracture - Rock mechanics - Brittleness - Hydraulic fracturing - Elastic moduli - Plasticity - Tensile strength
Uncontrolled terms: Confining pressures - Deformation and failure mechanism - Hydraulic fracturing treatments - Influence rule - Mechanical - Mechanism research - Sandstone samples - Sandstone strength - Situ conditions - Ultra deeps
Classification code: 482.2 Minerals - 483.1 Soils and Soil Mechanics - 502.1 Mine and Quarry Operations - 512.1.2 Petroleum Deposits : Development Operations - 931.1 Mechanics - 951 Materials Science
Funding Details: Number: 2021JM-407, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 20JK0843, Acronym: -, Sponsor: Education Department of Shaanxi Province;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

22. Progress in Effect of Metal and Metallic Oxide Doping on Uranium Dioxide Fuel

Accession number: 20211310147726
Title of translation:
Authors: Liu, Shuai (1, 3); Guo, Zixuan (2); Xin, Yong (2); Wang, Haoyu (2); Liu, Shichao (2); Bao, Hongwei (3); Ma, Fei (3)
Author affiliation: (1) College of Sciences, Xi'an Shiyou University, Xi'an; 710065, China; (2) Science and Technology on Reactor System Design Technology Laboratory, Nuclear Power Institute of China, Chengdu; 610041, China; (3) School of Materials Science and Engineering, Xi'an Jiaotong University, Xi'an; 710049, China
Corresponding author: Ma, Fei(mafei@xjtu.edu.cn)
Source title: Xiyou Jinshu Cailiao Yu Gongcheng/Rare Metal Materials and Engineering
Abbreviated source title: Xiyou Jinshu Cailiao Yu Gongcheng
Volume: 50
Issue: 2
Issue date: February 2021
Publication year: 2021
Pages: 725-732
Language: Chinese
ISSN: 1002185X
CODEN: XJCGEA
Document type: Journal article (JA)
Publisher: Science Press
Abstract: With the increasing demand of long period and high fuel consumption in commercial reactors, fuel pellets has to face more severe service conditions. How to further improve the properties of uranium dioxide fuel is the key problem in the development of new nuclear fuel elements. Based on the progress in doped fuel pellets in recent years, this paper systematically discussed the types of doped elements and their influence on the performance of uranium dioxide fuel pellets, expounded the relationship between the microstructure and performance of doped fuel, and

pointed out the existing problems and development trend for doped uranium dioxide fuel. The results provide valuable references for promoting the safety performance of fuel pellets. © 2021, Science Press. All right reserved.
Number of references: 77
Main heading: Fission products
Controlled terms: Fuels - Metals - Uranium dioxide - Pelletizing
Uncontrolled terms: Commercial reactor - Development trends - Doped elements - Existing problems - Metallic oxides - Safety performance - Service conditions
Classification code: 622.1 Radioactive Materials, General - 804.2 Inorganic Compounds
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

23. Green synthesis of ester base oil with high viscosity — Part II: Reaction kinetics study (*Open Access*)

Accession number: 20204509465426
Authors: Hu, Shaojian (1); Zhu, Jianhua (1); Wu, Bencheng (1); Ma, Rui (2); Li, Xiaohui (3)
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Corresponding author: Zhu, Jianhua(rdcas@cup.edu.cn)
Source title: Chemical Engineering Research and Design
Abbreviated source title: Chem. Eng. Res. Des.
Volume: 165
Issue date: January 2021
Publication year: 2021
Pages: 51-60
Language: English
ISSN: 02638762
CODEN: CERDEE
Document type: Journal article (JA)
Publisher: Institution of Chemical Engineers
Abstract: As an eco-friendly lubricant base oil, ester base oil is receiving increasing attention. However, studies on synthetic reaction kinetics of high viscosity complex ester have been rarely reported. In this work, based on the principle of equal reactivity of all functional groups and simplified kinetics models, synthetic reaction kinetics for high viscosity complex ester was investigated in two steps. As for the esterification of trimethylolpropane with glutaric acid, the activation energies of the first and second stage were 55.3 and 73.5 kJ/mol, respectively. As for the esterification of the first step products with 2-ethylhexanoic acid, the activation energies of the first and second stage were 60.6 and 98.2 kJ/mol, respectively. As for the esterification of the first step products with n-heptanoic acid, its activation energy was 68.9 kJ/mol. A mutation phenomenon on reaction order from zero to second order was discovered, which could be explained by the strong adsorption of organic acid on catalyst surface. The conversion rate of carboxyl of synthetic reaction for mixed acid ester was estimated by simulation, and average relative error was less than 3.0%. The synthetic process of high viscosity complex ester was considered to consist of a series of parallel–consecutive reactions with addition–elimination mechanism. © 2020 Institution of Chemical Engineers
Number of references: 31
Main heading: Reaction kinetics
Controlled terms: Association reactions - Esterification - Activation energy - Kinetics - Viscosity - Esters
Uncontrolled terms: 2-ethylhexanoic acid - Average relative error - Catalyst surfaces - Consecutive reaction - Lubricant base oil - Synthetic process - Synthetic reactions - Trimethylolpropane
Classification code: 631.1 Fluid Flow, General - 802.2 Chemical Reactions - 804.1 Organic Compounds - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 3.00e+00%
DOI: 10.1016/j.cherd.2020.10.015
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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24. High-resolution Microwave Frequency Dissemination via 56 km Optical Fiber Based on Microwave Phase Compensation

Accession number: 20212010360115
Title of translation: 56 km
Authors: Quan, Honglei (1, 2); Zhao, Wenyu (1, 2); Xue, Wenxiang (1); Xing, Yan (1); Jiang, Haifeng (1, 2); Guo, Wenge (1, 3); Zhang, Shougang (1, 2)
Author affiliation: (1) National Time Service Center, Chinese Academy of Sciences, Key Laboratory of Time and Frequency Standards of CAS, Xi'an; 710600, China; (2) University of Chinese Academic of Sciences, Beijing; 100049, China; (3) School of Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Zhao, Wenyu(zhaowy@ntsc.ac.cn)
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Abbreviated source title: Guangzi Xuebao
Volume: 50
Issue: 4
Issue date: April 25, 2021
Publication year: 2021
Article number: 0406003
Language: Chinese
ISSN: 10044213
CODEN: GUXUED
Document type: Journal article (JA)
Publisher: Chinese Optical Society
Abstract: This paper reports a microwave frequency dissemination experiment over a 56 km-long-fiber link in the laboratory, exhibiting frequency instabilities of 1.8×10-15/s and 4×10-18/104s. The phase perturbation accumulated along the fiber link is detected by comparing the round-trip signal with the reference signal. By controlling the phase of the transmitted signal in real time, the phase perturbation along the fiber link is compensated. Different modulation frequencies are used to avoid stray reflection effect. To improve the phase noise of the detection signal, we also implemented dispersion compensation. © 2021, Science Press. All right reserved.
Number of references: 19
Main heading: Fibers
Controlled terms: Signal detection - Microwave frequencies - Phase noise
Uncontrolled terms: Frequency disseminations - Frequency instabilities - Modulation frequencies - Phase compensation - Phase perturbation - Reference signals - Stray reflections - Transmitted signal
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 716.1 Information Theory and Signal Processing
Numerical data indexing: Size 5.60e+04m
DOI: 10.3788/gzxb20215004.0406003
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Funding text: The National Science Fund for Distinguished Young Scholars(No.61825505).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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25. Development of Position Sensor of Inflow Control Valve for Intelligent Completion

Accession number: 20220411514887
Authors: Wang, Jinlong (1); Zhang, Shuo (1); Chen, Tian (1); Wang, Yingru (2); Liu, Jingchao (3); Wu, Yuchen (4)
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Corresponding author: Zhang, Shuo(zhangshuo8@cnpc.com.cn)
Source title: Proceedings of SPIE - The International Society for Optical Engineering
Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 12079
Part number: 1 of 1
Issue title: Second IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
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Article number: 120790C
Language: English
ISSN: 0277786X
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CODEN: PSISDG
ISBN-13: 9781510650329
Document type: Conference article (CA)
Conference name: 2nd IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
Conference date: October 8, 2021 - October 10, 2021
Conference location: Xi'an, China
Conference code: 176101
Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE
Abstract: The accurate regulation of the flow rate of the inflow control valve is the core technology of production fluid control in intelligent completion. The accurate monitoring of the inflow control valve opening is the key technology to realizing its intelligent closed-loop control. The existing hydraulic inflow control valve in China has no sliding sleeve position sensor and thus cannot accurately position the opening of the sliding sleeve and achieve the precise control of production. In this study, the position sensor of the inflow control valve was developed by adopting a concentric linear structure, which can accurately measure the position of the sliding sleeve of the inflow control valve, integrate a single-core cable power supply and signal transmission technology, and share single-core steel pipe cables with the downhole electronic monitoring systems of intelligent completion in China. In China, the position sensor of the inflow control valve can be simply and quickly connected with the hydraulic inflow control valve without the need to modify the structure of the hydraulic inflow control valve, which is convenient for quick use and has strong versatility. Field test results show that the position sensor of the inflow control valve realizes the accurate positioning of the hydraulic inflow control valve and achieves the purpose. The development of this tool bridges the gap in the opening measurement of the hydraulic inflow control valve in China and lays the foundation for realizing the closed-loop intelligent control of the inflow control valve of intelligent completion. © 2021 SPIE
Number of references: 9
Main heading: Cables
Controlled terms: Flow control - Closed loop control systems - Position control
Uncontrolled terms: Core technology - Data collection - Fluid control - Inflow control valve - Intelligent completion - Position sensors - Production fluids - Single-core cables - Sliding sleeves - Valve opening
Classification code: 631.1 Fluid Flow, General - 731.1 Control Systems - 731.3 Specific Variables Control - 961 Systems Science
DOI: 10.1117/12.2622884
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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26. Effect of O2/CH4 atmosphere on tar production during coal pyrolysis

Accession number: 20213610860239
Authors: Niu, Ben (1); Liu, Ruichun (1); Zhang, Juntao (1); Shi, Runkun (1); Zhong, Hanbin (1); Wang, Jiaofei (2)
Author affiliation: (1) Engineering Research Center of Low Carbon Energy & Chemical, College of Chemistry & Chemical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) State Key Laboratory of High-efficiency Utilization of Coal and Green Chemical Engineering, Ningxia University, Ningxia, Yinchuan; 750021, China
Corresponding author: Niu, Ben(wsniuben@163.com)
Source title: Journal of Analytical and Applied Pyrolysis
Abbreviated source title: J Anal Appl Pyrolysis
Volume: 159
Issue date: October 2021
Publication year: 2021
Article number: 105317
Language: English
ISSN: 01652370
CODEN: JAAPDD

Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In this paper, coal pyrolysis in O2/CH4 atmosphere was studied by an atmospheric fixed-bed reactor. The effect of reaction temperature on yield, fraction distribution and composition of tar was explored to understand formation of tar during coal pyrolysis. The results show that the addition of O2 to CH4 can enhance tar formation and tar yield reaches 18.15 wt.% at the O2/CH4 ratio of 15:85 and temperature of 650 °C, which is about 1.24 and 1.7 times as those in CH4 and N2 atmosphere, respectively. The fraction distributions of tar were obtained with simulated distillation, which indicates the addition of O2 to methane can improve the content of asphalt at 550 °C and the contents of anthracene oil and asphalt at 600 °C. The contents of naphthalene oil, wash oil, anthracene oil and asphalt from coal pyrolysis at 650 °C are improved by using O2/CH4 as pyrolysis atmosphere. The results of gas chromatography – mass spectrometry / flame ionization detector show that the addition of O2 to CH4 is conducive to formation of aliphatics, aromatics and alcohols, but unbeneficial to formation of phenols compared with that in pure CH4 atmosphere. Lower aromaticity and longer alkyl-substituents of tar from O2/CH4 atmosphere than that from N2 atmosphere indicate that [rad]CH3 from methane-oxygen reaction directly combine with coal radicals to increase tar yield and affect the fraction distribution and composition of tar. © 2021 Elsevier B.V.
Number of references: 30
Main heading: Oxygen
Controlled terms: Ionization of gases - Methane - Pyrolysis - Chemical reactors - Coal - Distillation - Anthracene - Asphalt - Tar - Mass spectrometry - Gas chromatography - Naphthalene
Uncontrolled terms: Alkyl substituent - Fixed bed reactor - Fraction distribution - Ionization detectors - N2 atmospheres - Oxygen reaction - Reaction temperature - Simulated distillation
Classification code: 411.1 Asphalt - 524 Solid Fuels - 801 Chemistry - 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Temperature 8.23e+02K, Temperature 8.73e+02K, Temperature 9.23e+02K
DOI: 10.1016/j.jaap.2021.105317
Funding Details: Number: 2020-KF-09, Acronym: -, Sponsor: State Key Laboratory of High-efficiency Utilization of Coal and Green Chemical Engineering, Ningxia University; Number: 21908175, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China; Number: 2021GY-134, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project; Number: 2019JLM-1, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work is supported by Youth Program of National Natural Science Foundation of China (No. 21908175), Key Research and Development Program of Shaanxi (No. 2021GY-134), Natural Science Basic Research Program of Shaanxi (No. 2019JLM-1) and Foundation of State Key Laboratory of High-efficiency Utilization of Coal and Green Chemical Engineering (Grant No. 2020-KF-09).
Compendex references: YES
Database: Compendex
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27. Impacts of mineral composition and pore structure on spontaneous imbibition in tight sandstone

Accession number: 20210609889804
Authors: Liu, Dengke (1, 2, 3); Ren, Dazhong (3, 4); Du, Kun (5); Qi, Yiru (6); Ye, Feng (7)
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Volume: 201
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Article number: 108397
Language: English
ISSN: 09204105

Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Spontaneous imbibition is a fundamental mechanism to figure out the rock-fluid interplay during waterflooding and hydraulic fracturing. Mineral composition and pore structure play significant roles in imbibition efficiency, but how these parameters influence the oil production efficiency still is a myth. This research conducted the spontaneous imbibition experiments combined with low-temperature adsorption and nuclear magnetic resonance to (1) study how minerals and pore structures impact fluid movement features for tight sandstones; (2) systematically investigate the contribution to oil recovery of different pores' types and the impact of pore connectivity on spontaneous imbibition. The results show that the brine is inclined to attach hydrophilic minerals because of the wettability, increasing the imbibition efficiency. Additionally, with the tiny pores' development, the oil is more easily replaced by the brine due to strong capillary pressure. Last, as the mainstream imbibition area grows, the oil is preferentially displaced by the brine. The research provides insights into how mineral compositions and pore structures can influence spontaneous imbibition efficiency and improves the understanding of the complicated interaction between fluid and minerals in tight sandstones. © 2021 Elsevier B.V.
Number of references: 28
Main heading: Temperature
Controlled terms: Minerals - Sandstone - Efficiency - Pore structure - Structure (composition)
Uncontrolled terms: Fundamental mechanisms - Hydrophilic minerals - Imbibition efficiencies - Low temperatures - Mineral composition - Pore connectivity - Spontaneous imbibition - Tight sandstones
Classification code: 482.2 Minerals - 641.1 Thermodynamics - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.petrol.2021.108397
Funding Details: Number: PAG-201901, Acronym: -, Sponsor: -; Number: 11872295,41702146, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: KF2019-1,KF2020-2, Acronym: CRECU, MLR, Sponsor: Key Laboratory of Coal Resources Exploration and Comprehensive Utilization, Ministry of Land and Resources; Number: 2016ZX05047-003-005, Acronym: -, Sponsor: National Science and Technology Major Project;
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Compendex references: YES
Database: Compendex
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28. Numerical study on flow field and pollutant dispersion in an ideal street canyon within a real tree model at different wind velocities

Accession number: 20200208027656
Authors: Wang, Le (1); Su, Junwei (2); Gu, Zhaolin (2); Tang, Liyu (3)
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Corresponding author: Wang, Le(180907@xsyu.edu.cn)
Source title: Computers and Mathematics with Applications
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Volume: 81
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Publication year: 2021
Pages: 679-692
Language: English
ISSN: 08981221
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Studying the effects of trees on airflow and pollutant dispersion in urban street canyons is of considerable significance to clarify the laws of urban micro-scale airflow and pollutant dispersion. To characterize the trees in street canyons, different from the traditional vegetation resistance source method, in this paper, a fine tree model is used for numerical simulations of the airflow and pollutant dispersion in street canyons at varying inflow wind velocities. It is found during the study that the presence of trees physically blocks the airflow in street canyons. The airflow is

sheared by the trunk, canopy, or branches, and then circumvents them, especially at a high inflow wind velocity. The low-velocity area in the street canyon distributes to the leeward side of the tree trunk as well as in the canopy area, and a discrete low-velocity distribution exists mainly in the canopy area. The average wind velocity in a street canyon with trees is approximately 39.5% lower at an inflow wind velocity of 1.7 m/s than that in a canyon without trees. In the presence of trees, the pollutant concentration in street canyons increases significantly, and the pollutants significantly accumulate between the tree trunk and the leeward side. With increasing inflow velocity, the pollutant concentration in a street canyon constantly changes but is much higher than that in the absence of trees. At a wind velocity of 5.7 m/s, the average pollutant concentration is 18.6% higher in street canyons with trees than in those without trees. © 2020 Elsevier Ltd
Number of references: 50
Main heading: Velocity
Controlled terms: Velocity distribution - Forestry - Numerical models - Wind speed - Numerical methods - Air
Uncontrolled terms: Inflow velocity - Pollutant concentration - Pollutant dispersions - Real trees - Street canyon - Urban street canyon - Vegetation resistance - Wind velocities
Classification code: 615.8 Wind Power (Before 1993, use code 611) - 804 Chemical Products Generally - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 921 Mathematics - 921.6 Numerical Methods - 922.2 Mathematical Statistics
Numerical data indexing: Percentage 1.86e+01%, Percentage 3.95e+01%, Velocity 1.70e+00m/s, Velocity 5.70e+00m/s
DOI: 10.1016/j.camwa.2019.12.026
Funding Details: Number: 2019-JQ335, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 41861144021,41971344,11872295,11572242, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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29. Forbidden subgraphs in enhanced power graphs of finite groups

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Authors: Ma, Xuanlong (1); Zahirovi, Samir (2); Lv, Yubo (3); She, Yanhong (1)
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Corresponding author: Zahirovi, Samir(samir.zahirovic@dmi.uns.ac.rs)
Source title: arXiv
Abbreviated source title: arXiv
Issue date: April 10, 2021
Publication year: 2021
Language: English
E-ISSN: 23318422
Document type: Preprint (PP)
Publisher: arXiv
Abstract: MSC Codes 05C25, 05C38The enhanced power graph of a group is the simple graph whose vertex set is consisted of all elements of the group, and whose any pair of vertices are adjacent if they generate a cyclic subgroup. In this paper, we classify all finite groups whose enhanced power graphs are split and threshold. We also classify all finite nilpotent groups whose enhanced power graphs are chordal graphs and cographs. Finally, we give some families of non-nilpotent groups whose enhanced power graphs are chordal graphs and cographs. These results partly answer a question posed by Peter J. Cameron. © 2021, CC BY.
Number of references: 36
Main heading: Graphic methods
Controlled terms: Graph theory
Uncontrolled terms: Chordal graphs - Cograph - Enhanced power graph - Finite groups - Forbidden subgraphs - Nilpotent groups - Power graphs - Simple++ - Splits graphs - Threshold graphs
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.48550/arXiv.2104.04754
Compendex references: YES

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30. A new method of land space planning based on resource and environment carrying capacity and SOM neural network

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Authors: Xie, Wanli (1, 2, 3); Jing, Xu (1); Du, Lei (1, 4); Zhang, Mao-Sheng (1, 2, 3); Sun, Ping-Ping (1, 2, 3)
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Conference name: 8th Academic Conference of Geology Resource Management and Sustainable Development
Conference date: December 19, 2020
Conference location: Beijing, Virtual, China
Conference code: 167413
Sponsor: Hubei Zhongke Geology and Environment Technology Institute
Publisher: Aussino Academic Publishing House
Abstract: How to reasonably coordinate the relationship between regional economic development, resource development and environmental protection is an important issue in the current concept of green development. This paper is oriented to the evaluation and calculation of resource and environmental carrying capacity and land and space planning, and proposes a set of evaluation systems, covering 15 factors such as cultivated land resource carrying potential, construction land development potential, water resources development and utilization intensity, geological disaster susceptibility index, and transportation advantage. The elements adopt TOPSIS evaluation method to calculate the carrying capacity of resources and environment. At the same time, the improved CRITIC weighting method is used to weight the evaluation indicators of the TOPSIS evaluation method to increase reliability. The calculation results show that the current resource and environmental carrying capacity index of Yanchang County is located in [0.1977, 0.8102], which can be divided into four levels: strong, strong, weak, and weak. The evaluation results are clustered using SOM neural network clustering method to cluster regions with the same characteristics. The clustering results divide Yanchang County into four regions. Comprehensively considering the influencing factors of the regional resource and environmental carrying capacity, the regions can be divided into priority development zones, key development zones, developable zones and ecological environment restoration zones according to their attributes to provide guidance for the later development of territorial and spatial planning. © Geology Resource Management and Sustainable Development.All right reserved.
Number of references: 26
Main heading: Environmental protection
Controlled terms: Clustering algorithms - Geology - Sustainable development - Regional planning - Economics - Water resources
Uncontrolled terms: Calculation results - Ecological environments - Environmental carrying capacities - Evaluation indicators - Regional economic development - Resource and environment - Resource development - Water resources development
Classification code: 403.2 Regional Planning and Development - 444 Water Resources - 454.2 Environmental Impact and Protection - 481.1 Geology - 903.1 Information Sources and Analysis - 971 Social Sciences

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Database: Compendex
Data Provider: Engineering Village
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31. A novel hybrid filter/wrapper method for feature selection in archaeological ceramics classification by laser-induced breakdown spectroscopy

Accession number: 20210709910529
Authors: Ruan, Fangqi (1); Hou, Lin (3); Zhang, Tianlong (1); Li, Hua (1, 2)
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Corresponding authors: Zhang, Tianlong(tlzhang@nwu.edu.cn); Li, Hua(huali@nwu.edu.cn)
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Pages: 1023-1031
Language: English
ISSN: 00032654
E-ISSN: 13645528
CODEN: ANALAO
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Laser-induced breakdown spectroscopy (LIBS) has been appreciated as a valuable analytical tool in the cultural heritage field owing to its unique technological superiority, particularly in combination with chemometric methods. Feature selection (FS) as an indispensable pre-processing step in data optimization, for eliminating the redundant or irrelevant features from high-dimensional data to enhance the predictive capacity and result comprehensibility of multivariate classification based on LIBS technology. In this paper, a novel hybrid filter/wrapper method based on the MI-DBS algorithm was proposed to enhance the qualitative analysis performance of the LIBS technique. The proposed method combines the advantages of the mutual information (MI) algorithm based filter method and bi-directional selection (DBS) algorithm based wrapper method. The MI algorithm is the first to remove the redundant or uncorrelated features so that a simplified input subset can be established. Then, the DBS algorithm is used to further select the retained features and hence to seek an optimal feature subset with good predictive performance. To benefit the above feature selection process, the wavelet transform denoising (WTD) method was used to reduce the noise from LIBS spectra. LIBS experiments were performed using 35 archaeological ceramic samples. Besides, the proposed hybrid filter/wrapper method was implemented through a random forest (RF) based nonlinear multivariate classification method. Through a comparison between several other feature selection methods and the proposed method, it has been seen that the proposed method is the best regarding the predictive performance and number of the selected features. Finally, the MI-DBS algorithm is used to seek the optimal features from the full spectrum (220-720 nm); the corresponding sensitivity, specificity and accuracy acquired through the RF classifier for the test set were 0.9722, 0.9956 and 0.9850. It is shown from the general results that the MI-DBS algorithm is more effective in terms of improving the model performance and decreasing the redundant or uncorrelated features and computational time and serves as a good alternative for FS in multivariate classification. This journal is © The Royal Society of Chemistry.
Number of references: 43
Main heading: Bandpass filters
Controlled terms: Classification (of information) - Feature Selection - Laser induced breakdown spectroscopy - Ceramic materials - Wavelet transforms - Decision trees - Atomic emission spectroscopy - Clustering algorithms

Uncontrolled terms: Archaeological ceramics - Cultural heritage field - Feature selection methods - High dimensional data - Laserinduced breakdown spectroscopy (LIBS) - Multivariate classification - Predictive performance - Uncorrelated features
Classification code: 703.2 Electric Filters - 716.1 Information Theory and Signal Processing - 812.1 Ceramics - 903.1 Information Sources and Analysis - 921.3 Mathematical Transformations - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 931.1 Mechanics - 961 Systems Science
Numerical data indexing: Size 2.20e-07m to 7.20e-07m
DOI: 10.1039/d0an02045a
Funding Details: Number: WSFRM20190503001, Acronym: -, Sponsor: -; Number: 21605123,21675123,21873076, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JQ2013, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 17JK0780, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 21873076, 21675123, and 21605123); the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2018JQ2013); the Scientific Research Plan Projects of Shaanxi Education Department (No. 17JK0780); the Project of the Key Laboratory of Well Stability and Fluid & Rock Mechanics in Oil and Gas Reservoir of Shaanxi Province, Xi'an Shiyou University (No. WSFRM20190503001).
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Data Provider: Engineering Village
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32. High-order streamline simulation and macro-scale visualization experimental studies on waterflooding under given pressure boundaries

Accession number: 20211210117807
Authors: Zhang, Nan (1, 2); Cao, Jie (1); James, Lesley A. (3); Johansen, Thormod E. (4)
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Corresponding author: Zhang, Nan(nanz@xsyu.edu.cn)
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Volume: 203
Issue date: August 2021
Publication year: 2021
Article number: 108617
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In this paper, a new high-order streamline simulation method with a known pressure boundary is proposed. It extends the Riemann approach along streamlines from constant flow rate boundaries to given pressure boundaries. This method computes the varied flow resistance of streamtube directly by using the velocity and time-of-flight of its central streamline, and improves the simulation accuracy by applying a high-order streamline tracing method. Simultaneously, a series of macro-model visualization experiments are performed to study waterflooding processes under given pressure boundaries. The new streamline method is independently validated by history matching and direct modelling of the experiments. Finally, the capillary effects at the water front are quantified as a function of time and space with the assists of streamline simulations. © 2021 Elsevier B.V.
Number of references: 29
Main heading: Visualization
Controlled terms: Flight simulators
Uncontrolled terms: Constant pressure boundary - High-order - High-order streamline simulation - Higher-order - Macro scale - New high - Pressure boundary - Riemann approach - Streamline simulation - Waterflooding visualization experiment
DOI: 10.1016/j.petrol.2021.108617
Funding Details: Number: -, Acronym: PRAC, Sponsor: Petroleum Research Newfoundland and Labrador; Number: -, Acronym: HMDC, Sponsor: Hibernia Management and Development Company; Number: -, Acronym: CFI, Sponsor: Canada Foundation for Innovation; Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number:

-, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: 20JK0835, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 52004214, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This research is funded by the Open Fund (PLC2020036) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology) ; the National Natural Science Foundation of China (Grant No. 52004214); Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 20JK0835); Hibernia Management and Development Company (HMDC) ; Chevron Canada; the Natural Sciences and Engineering Research Council of Canada (NSERC) ; the Canada Foundation for Innovation (CFI) ; the Government of Newfoundland and Labrador Department of Industry, Energy and Technology ; and Petroleum Research Newfoundland and Labrador (PRNL) . The authors would also like to thank the Hibernia EOR Lab staff for their support during the experimental work.
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33. A review of prediction methods for oilfield produced water scaling (*Open Access*)

Accession number: 20210910008790
Authors: Yan, Yan (1, 2); Yu, Tao (1, 2); Song, Jiayu (1); Wu, Baichun (1); Qu, Chengtun (1, 2)
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Corresponding author: Qu, Chengtun(xianquct@yeah.net)
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Issue: 3
Issue title: 3rd International Conference on Green Energy and Sustainable Development - Number 3
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Conference name: 3rd International Conference on Green Energy and Sustainable Development, GESD 2020
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Conference location: Shenyang City, Virtual, China
Conference code: 167246
Sponsor: CCCC Second Harbour Engineering Company Ltd.; Chishun Chemical; Wanxiang Group Technology Center
Publisher: IOP Publishing Ltd
Abstract: In oilfield development, pipeline corrosion and reservoir damage caused by produced water scaling are serious problems. Studying the scaling trend of produced water, and predicting the scaling position, scale amount, and scale type is of great significance to the production and development of oilfields, as well as scale prevention and cleaning. In this paper, the mechanism of scaling in produced water is studied from the perspective of five aspects: fluid incompatibility, thermodynamic condition change, crystal adsorption, kinetic factors and bacterial corrosion; moreover, other factors affecting the scaling are analyzed. Mathematical models of scaling prediction methods, scaling prediction methods, and simulation experiments of scaling prediction methods are introduced, and the characteristics of each scaling prediction method and simulation experiment are compared. Finally, the development of scaling prediction methods is prospected. © Published under licence by IOP Publishing Ltd.
Number of references: 27
Main heading: Produced Water
Controlled terms: Oil field development - Forecasting - Pipeline corrosion
Uncontrolled terms: Bacterial corrosion - Kinetic factors - Oilfield produced waters - Prediction methods - Reservoir damage - Scale prevention - Scaling prediction - Thermodynamic conditions
Classification code: 452.3 Industrial Wastes - 512.1.2 Petroleum Deposits : Development Operations - 539.1 Metals Corrosion
DOI: 10.1088/1755-1315/651/3/032052

Compendex references: YES
Open Access type(s): All Open Access, Gold
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Data Provider: Engineering Village
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34. Tight reservoirs classification using random forest: A case study of he 8 member in eastern yan'an gas field

Accession number: 20213510848137
Authors: Yan, Wang (1); Ruogu, Wang (2); Shengyi, Yang (3); Jianping, Liu (4)
Author affiliation: (1) College of Petroleum Engineering, Xi'An Shiyou University, Xi'an, China; (2) Research Institute, Yanchang Petroleum (Group) Co. Ltd., Xi'an, China; (3) Guizhou Minzu University, Key Laboratory of Pattern Recognition and Intelligent Systems of Guizhou Province, Guiyang, China; (4) Changqing Oilfield Company, Exploration Department of PetroChina, Xi'an, China
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Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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ISBN-13: 9781665437158
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Tight sandstone reservoir is very important in oil and gas exploration in China. Tight reservoirs classification and evaluation are a frontier research field. There are many indexes involved in reservoirs classification, and it is necessary to judge the reservoir type according to personal experience, which consumes lots of time and manpower. Therefore, a new classification method of tight reservoirs using random forest is proposed. Firstly, the high pressure mercury injection curves of tight sandstone reservoirs of He 8 member of Lower Shihezi Formation in eastern Yan'an Gas Field are selected as the research data. Four characteristics for classification are obtained by principal component analysis. Secondly, the random forest using CART is used to classify and obtain the results of reservoir classification. Finally, classification results are verified and parameters of the random forest are optimized. Experimental results show that the proposed reservoirs classification method has high accuracy and low calculation cost. It can effectively reduce time loss and save manpower, and has good generalization. © 2021 IEEE.
Number of references: 7
Main heading: Principal component analysis
Controlled terms: Gas industry - Sandstone - Petroleum prospecting - Decision trees - Random forests - Tight gas
Uncontrolled terms: Classification and evaluations - Classification methods - Classification results - High pressure mercury - Oil and gas exploration - Personal experience - Tigh treservoirs - Tight sandstone reservoirs
Classification code: 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 723.4.2 Machine Learning - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.2 Mathematical Statistics - 961 Systems Science
DOI: 10.1109/ICMSP53480.2021.9513413
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35. An energy-aware resource deployment algorithm for cloud data centers based on dynamic hybrid machine learning

Accession number: 20211710255516
Authors: Liang, Bin (1); Wu, Di (2); Wu, Pengfei (3); Su, Yuanqi (4)
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Corresponding author: Wu, Pengfei(howlaser@163.com)
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Article number: 107020
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Abstract: To meet the ever-increasing requirements of cloud users, cloud service providers have further increased the deployment of cloud data centers. Cloud users can freely choose the cloud data center that suits them according to their own business characteristics and budget expenditures. This requires cloud service providers to continuously improve service quality and reduce usage costs to expand their own user base. Mature cloud service providers will continuously optimize cloud tasks and virtual machine deployment methods to increase physical machine utilization and reduce cloud data center energy consumption. However, existing virtual machine deployment algorithms usually have low utilization of physical machines or high energy consumption of cloud data centers, thereby reducing the frequency of use by cloud users and the benefits of cloud service providers. This paper systematically analyzes virtual machine and physical machine models. At the same time, the K-means clustering algorithm for unsupervised learning and the KNN classification algorithm for supervised learning are expanded to establish a dynamic hybrid resource deployment rule. Then, an energy-aware resource deployment algorithm for cloud data centers based on dynamic hybrid machine learning (EHML) is proposed based on the theory of machine learning. This algorithm reduces energy consumption by increasing the average utilization of physical machines. Finally, the experimental test results show that the average utilization of physical machines and energy consumption of the algorithm are significantly better than those of the comparison algorithms. © 2021 Elsevier B.V.
Number of references: 34
Main heading: Energy utilization
Controlled terms: Budget control - Learning algorithms - Virtual machine - Dynamics - Supervised learning - K-means clustering - Network security - Power management - Unsupervised learning - Cloud computing
Uncontrolled terms: Center-based - Cloud data centers - Cloud service providers - Deployment algorithms - Energy aware - Energy consumption optimization - Hybrid machine learning - Machine-learning - ON dynamics - Resource deployments
Classification code: 525.3 Energy Utilization - 704.2 Electric Equipment - 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications - 723.4.2 Machine Learning - 723.5 Computer Applications - 903.1 Information Sources and Analysis
DOI: 10.1016/j.knosys.2021.107020
Funding Details: Number: 2019GY-033, Acronym: -, Sponsor: -; Number: 2017YFB1001700, Acronym: -, Sponsor: -; Number: 2020KJRC0101, Acronym: -, Sponsor: -; Number: 2020CGXNG-041, Acronym: -, Sponsor: -; Number: 20JC027, Acronym: -, Sponsor: -; Number: 2020KJRC0085, Acronym: -, Sponsor: -;
Funding text: This work was supported by National key R & D plan, China "cloud computing and big data" key special project (2017YFB1001700), the Key R & D Plan of Shaanxi Province, China (General Project) [No. 2019GY-033], Shaanxi Province Science and Technology Achievements Transfer and Promotion Plan Project, China [No. 2020CGXNG-041], Special Scientific Research Plan of Shaanxi Provincial Department of Education, China [No. 20JC027], Xi'an Science and Technology Plan Project, China [2020KJRC0085] and the Science and Technology

Program of Xi'an, China [No. 2020KJRC0101].This work was supported by National key R & D plan, China "cloud computing and big data" key special project (2017YFB1001700), the Key R & D Plan of Shaanxi Province, China (General Project) [No. 2019GY-033], Shaanxi Province Science and Technology Achievements Transfer and Promotion Plan Project, China [No. 2020CGXNG-041], Special Scientific Research Plan of Shaanxi Provincial Department of Education, China [No. 20JC027], Xi'an Science and Technology Plan Project, China [2020KJRC0085] and the Science and Technology Program of Xi'an, China [No. 2020KJRC0101].
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36. Anion-Dependent Structure and Luminescence Diversity in ZnII-LnIIIHeterometallic Architectures Supported by a Salicylamide-Imine Ligand

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Publisher: American Chemical Society
Abstract: To advance the structural development and fully explore the application potential, it is highly desirable but challenging to elucidate the relationship between the structures and properties of ZnII-LnIII heterometallic species. Herein, three types of ZnII-LnIII heterometallic compounds (LnIII = GdIII, TbIII) formulated as [Zn16Ln4L12(μ3-O)4(NO3)12]·8CH3CN (ZnLn-1), [Zn2Ln2L2(NO3)6(H2O)2]·3CH3CN (ZnLn-2), and [Zn4Ln2L8(OAc)12]·xCH3CN (ZnLn-3: for Ln = Gd, x = 5; for Ln = Tb, x = 4) were dictated by common inorganic anions, NO3- and OAc-, with the aid of the multidentate ligand H2L with propane as the central skeleton and 3-methoxysalicylamide and 3-methoxysalicylaldimine as terminal groups. ZnLn-1 features cubic cages with four {Zn4L3} tetrahedral subunits and four Ln3+ centers positioned at the eight vertices alternately when NO3- was introduced into the reaction system exclusively. An attempt to replace NO3- in ZnLn-1 with OAc- partially led to the formation of {Zn2Ln2L2} heterometallic wheels. Meanwhile, ZnLn-3 featuring double-hairpin-like {Zn4Ln2L4} hemicycles that are orthogonal to each other assisted by intermolecular hydrogen bonds was constructed when NO3- in ZnLn-1 was completely replaced by OAc-. Their structural integrity in solution were ascertained by both emission and 1H NMR spectroscopy. Ascribed to the different Zn2+-containing antenna, ZnTb-2 possesses a relatively strong emission characteristic of Tb3+ ZnTb-1 has moderate Tb3+ luminescence, yet an absence of Tb3+ emission is found in ZnTb-3. Such an emission difference could be mainly attributed to the antenna effect directed by distinct structural characteristics induced by anions. The anion-dictated self-Assembly strategy presented herein not only offers a facile approach to regulate the coordination mode of H2L to such an extent to obtain diverse structures of ZnII-LnIII heterometallic species but also provides an understanding of how common inorganic anions tune coordination-driven self-Assemblies as well as the subsequent luminescence properties. © 2021 American Chemical Society.
Number of references: 47
Main heading: Ligands
Controlled terms: Hydrogen bonds - Luminescence - Negative ions - Amides - Antennas - Nuclear magnetic resonance spectroscopy
Uncontrolled terms: Common inorganic anions - Hairpin-like - Heterometallic compounds - Heterometallics - Imine ligands - Multidentate ligands - Salicylamides - Structural development - Structures and properties - Terminal groups

Classification code: 741.1 Light/Optics - 801.4 Physical Chemistry - 804.1 Organic Compounds
Numerical data indexing: Inductance 1.00E00H
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37. Pore structure characteristics and their influencing factors: A case study from the middle jurassic mixed siliciclastic carbonate rocks, Turpan-Hami basin, Northwest China

Accession number: 20211010057223
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Corresponding author: Huang, Zhilong(huangzhilong1962@163.com)
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Abstract: The mixed siliciclastic-carbonate rocks of the second member of the Qiketai Formation (J2q2) in the Turpan-Hami Basin are lacustrine tight oil reservoir with vitrinite reflectance values (%, Ro) ranging from 0.64% to 0.81%. X-ray diffraction (XRD), thin sections, field emission scanning electron microscopy (FE-SEM) of argon-milled thin sections, low-temperature N2 adsorption (LNTA), and nuclear magnetic resonance (NMR) analyses were performed to investigate the pore structure characteristics and their influencing factors of the mixed siliciclastic-carbonate reservoirs. The results show that the tight reservoir has a medium-high total organic carbon (TOC) content, and the sedimentary textures include laminated, massive, and intraclasts-rich types. Nanometer scale interparticle pores and microfractures are dominant in the tight reservoirs. The small pores (2–100 nm) make a dominant contribution to the nanoscale storage space according to the comprehensive analysis of the T2 spectra of NMR. Reversed S-shaped isotherms obtained from N2 adsorption are type IV, and hysteresis loops indicate that the shape of pores include slit-or plate-like, ink-bottle-shaped and mixtures of the two. BET surface areas and BJH total pore volume vary from 1.707 m2/g to 8.556 m2/g and 1.13 cm3/100 g to 3.0 cm3/100 g, with an average of 4.31 m2/g and 1.848 cm3/100 g, respectively. The massive and intraclasts-rich rocks have higher NMR porosities, pore sizes and pore volumes than the laminated rocks. Based on the Frenkel-Halsey-Hill model of low-temperature N2 adsorption, the fractal dimensions D1 and D2 are 2.4305–2.7081 and 2.2667–2.6070, respectively. The correlations between the pore structure parameters and the mineralogical composition, TOC content, and fractal dimension reveal that dolomite makes greater contribution to the pore volume and movable fluid saturation than the siliciclastic gains and organic matter, resulting in higher fractal dimensions and more complicated pore structure. In addition, the clay minerals increase pore specific surface area and its complexity in the tight reservoirs. The samples with high silicate mineral and TOC contents tend to contain lower specific surface areas and pore volumes, resulting in lower fractal dimensions and more simplistic pore structure than clay rich samples. Therefore, the complex mineralogical composition, various sedimentary textures and organic matter content all play important roles in the development of pore network. © 2021 Elsevier B.V.
Number of references: 69
Main heading: Pore structure
Controlled terms: Enamels - Organic carbon - Scanning electron microscopy - Sedimentary rocks - Adsorption - Magnetism - Field emission microscopes - Petroleum reservoirs - Pore size - Textures - Carbonation -

Fourier transform infrared spectroscopy - Nuclear magnetic resonance - Fractal dimension - Petroleum reservoir engineering - Temperature - Bottles
Uncontrolled terms: Lacustrine mixed siliciclastic-carbonate sediment - N-2/ adsorption - Pore volume - Pores structure - Siliciclastic carbonates - Structure characteristic - Tight oil reservoir - Tight reservoir - Total organic carbon content - Turpan-Hami basin
Classification code: 482.2 Minerals - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 641.1 Thermodynamics - 694.2 Packaging Materials - 701.2 Magnetism: Basic Concepts and Phenomena - 741.3 Optical Devices and Systems - 801 Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.1 Organic Compounds - 813.2 Coating Materials - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Mass 1.00E-01kg, Percentage 6.40E-01% to 8.10E-01%, Size 1.00E-07m, Size 1.13E-02m, Size 1.707E+00m, Size 1.848E-02m, Size 3.00E-02m, Size 4.31E+00m, Size 8.556E+00m
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38. Tuning the coordination behavior of an unexplored asymmetric multidentate ligand for developing diverse heterometallic architectures with luminescent and magnetic properties

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Authors: Song, Xue-Qin (1); Xia, Xue-Li (1); Song, Fu-Qiang (1); Liu, Guo-Hua (1); Wang, Li (2, 3)
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Corresponding author: Song, Xue-Qin(songxq@mail.lzjtu.cn)
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Publisher: Royal Society of Chemistry
Abstract: Recently, by tuning the coordination behavior of a new asymmetric multidentate ligand,H3L, containing two nitrogen and six oxygen donors by both metal centres and anions,H3L= 1-(2-hydroxy-3-methoxy-benzamido)-2-(2-hydroxy-3-methoxy-benzylideneamino)-2-hydroxy propane, three types of heterometallic compounds with the chemical composition of [Zn8Ln2L2(OH)4(OAc)12]·xCH3OH·yCH3CN·zH2O (Zn8Ln2, where Ln = Nd, Tb, Dy and Er), [Ni3Tb2(HL)2(OH)4(OAc)6]·3CH3CN·H2O (Ni3Tb2), and [Ni2Tb2(HL)2(OAc)4(NO3)2(H2O)2]·4CH3CN·3H2O (Ni2Tb2) were developed. Structural analysis revealed that four ellipsoidal decanuclear ZnII-LnIIIclusters resulted from the assembly ofH3Lwith Zn(OAc)2·2H2O and Ln(OAc)3·6H2O. Replacement of Zn(OAc)2·2H2O with Ni(OAc)2·4H2O rendered a butterfly pentanuclear NiII-LnIIIcluster, and upon further using Tb(NO3)3·6H2O to replace Tb(OAc)3·6H2O, a tetranuclear NiII-LnIIImetallocycle was obtained. The luminescence studies on these compounds indicated that the ZnII-containing chromophore is a good antenna for sensitizing the characteristic emission of Ln3+effectively

from the visible to near-infrared region as a result of its energy match, perfect shielding and less concentration quenching compared to its NiIIanalogues, where the d → d transitions characteristic of Ni2+were observed in the excitation spectra when irradiated. Notably, weak emission bands characteristic of Tb3+were observed in the spectrum ofNi2Tb2but not in that ofNi3Tb2when excited by the d#d transition, which may be attributed to the difference in crystal field. Furthermore, the magnetic susceptibility studies indicate that the magnetic exchange for the TbIIIions inZn8Tb2,Ni3Tb2andNi2Tb2is ferromagnetic, whereas that for the DyIIIions inZn8Dy2is antiferromagnetic. Our results are of great significance for the rational design and synthesis of novel heterometallic supramolecular structures with interesting luminescence and magnetic properties. © The Royal Society of Chemistry 2020.
Number of references: 40
Main heading: Ligands
Controlled terms: Luminescence - Magnetic properties - Antennas - Chromophores - Infrared devices
Uncontrolled terms: Characteristic emission - Chemical compositions - Concentration quenching - Coordination behavior - Heterometallic compounds - Luminescence studies - Multidentate ligands - Supramolecular structure
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 741.1 Light/Optics - 801.4 Physical Chemistry - 804.1 Organic Compounds
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39. Pore structure characteristics and evaluation of lacustrine mixed fine-grained sedimentary rocks: A case study of the Lucaogou Formation in the Malang Sag, Santanghu Basin, Western China

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Authors: Pan, Yongshuai (1, 2); Huang, Zhilong (1, 2); Li, Tianjun (1, 2); Xu, Xiongfei (3); Chen, Xuan (3); Guo, Xiaobo (4)
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Corresponding author: Huang, Zhilong(huangzhilong1962@163.com)
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Abstract: The lithology of the mixed fine-grained sedimentary rock reservoirs in the Permian Lucaogou Formation of the Santanghu Basin is very complex, and the reservoirs are dominated by light- and dark-colored laminated structures with extremely heterogeneous pore structure. In this study, the mineral compositions and pore types of the reservoirs were analyzed using thin sections, whole rock X-ray diffraction (XRD), scanning electron microscopy (SEM), and Quantitative Evaluation of Minerals by Scanning Electron Microscopy (QEMSCAN). This analysis was then combined with high-pressure mercury injection (HPMI), water-saturated nuclear magnetic resonance (NMR), and nano-CT scanning to quantitatively characterize the pore structure. In addition, the fractal dimensions obtained by NMR experimentation were used to comprehensively evaluate the pore structure and analyze the effect of volcanic ash on that structure. The results revealed that the reservoirs are characterized by fine-grained (2 spectra of the dolomite reservoir are mainly characterized by the right unimodal type (1–100 ms), which was mainly caused by the dolomite intercrystal pores and intercrystal dissolution pores, with the larger T2 components (>100 ms) mostly representing microfractures or vugs. In addition, the HPMI curves display a relatively low entry pressure (3–5 MPa), with medium sorting. The NMR T2 spectra of the tuff and transitional lithology reservoirs are diverse, however, with the low T2 components (0.01–1 ms) representing the intracrystal pores, intergranular pores that are mostly blocked

by organic matter (OM), and some remaining intergranular pores during compaction, while the right peaks (1–100 ms) are similar to the dolomite reservoir. Also, the HPMI curves exhibit a higher entry pressure (>6 MPa) with poor sorting. Based on the T2cutoff values, the fractal dimensions obtained by the NMR experiment could be divided into two distinct segments, representing different pore structure characteristics. The fractal dimension of the movable fluid pores (D2) ranged from 2.493 to 2.973 (average 2.765); nevertheless, the fractal dimension of bound fluid pores (D1) was determined to be unsuitable for fractal theory. Due to the influence of volcanic ash, there is a positive correlation among D2, felsic mineral content, and TOC, while the D2 displays a negative correlation with the movable fluid porosity, permeability, and dolomite content. Hence, D2 increases with increasing felsic mineral content and decreasing dolomite content, indicating that the tuffaceous material can make the pore structure more complex. The relationship between the calcite content and D2 is not obvious, however, and the clay mineral contents are so low that their effects on the pore structure are negligible. The results of this study indicate that the fractal dimension can comprehensively reflect the pore structure complexity of a mixed fine-grained sedimentary rock reservoir that affected by volcanic ash. © 2021 Elsevier B.V.
Number of references: 81
Main heading: Nuclear magnetic resonance
Controlled terms: Textures - Volcanoes - Computerized tomography - Lithology - Volcanic rocks - Fractal dimension - Scanning electron microscopy - Minerals - Petrophysics - Pore structure - Reservoirs (water) - Sedimentary rocks - Sedimentology
Uncontrolled terms: High pressure mercury - Intercrystalline pores - Movable fluid porosity - Nuclear magnetic resonance(NMR) - Petrophysical properties - Positive correlations - Quantitative evaluation - Structure characteristic
Classification code: 441.2 Reservoirs - 481.1 Geology - 481.1.2 Petrology (Before 1993, use code 482) - 482.2 Minerals - 484 Seismology - 723.5 Computer Applications - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 2.00e+00% to 8.00e+00%
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40. Genesis and accumulation patterns of unconventional oil reservoir in Member 8 of Triassic Yanchang Formation:a case study of the western Ganquan area, southeastern Ordos Basin

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Authors: Chen, Yiguo (1); He, Yonghong (1); Wang, Chao (1); Ge, Xinmin (2, 3); Ma, Fangxia (1); Meng, Wangcai (1); Ge, Yunjin (1); Li, Xiaolu (1); Fan, Xiaowei (1)
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Abstract: The remaining oil resources in the Member 8 of Yangchang Formation (Chang 8) in Ordos Basin account for 21.5×108t. There are less studies of the accumulation controlling factors and distribution rules of shale oil and tight oil, which restricts the exploration and discovery of unconventional reservoirs in the basin. Based on the data of core, logging, source rock evaluation, and experimental simulation in the study area, deep studies have been conducted on source-reservoir-caprock assemblages, pathway systems, and hydrocarbon accumulation mechanisms. The total amount of hydrocarbon expulsion in the west area of Ganquan is 1.41×108t, and the tectonic evolution dominates the interactive distribution of multiple sets of source rocks and multiple types of sandstone reservoirs. Four favorable source-reservoir-caprock assemblages are developed, including the thin intra-source sandstone interlayers of Chang 8 and of both Member 8 and Member 7 of Yanchang Formation, and the neighboring source and reservoir of the single layers Chang 82 and Chang 81. The shale reservoirs and tight reservoirs are dominated by type and source-reservoir integrated assemblages and type and neighboring source and reservoir assemblages, respectively. The geologic and recoverable reserves are controlled by reservoir quality and crude oil filling degree, which are the keys to form the geological sweet spots of unconventional oil reservoirs. A multi-sources and multi-reservoirs orderly composite accumulation model is established, and characterized with multi-source hydrocarbon-generating pressurization, driven multi-directional hydrocarbon supply, combined transportation via fracture networks, and differential charging among multi-reservoirs. Shale oil is mainly stored in a free state in thin interlayers of beach bar sandstones with excellent reservoir properties in the source rocks, formed by primary migration and accumulation in the hydrocarbon source rocks. In addition, a small quantity of shale oil is adsorbed in the intra-source silty laminae, or occurred in lamellation fractures and pores in a free state, indicating in-situ accumulation. Tight oil is stored in a free state in sand bodies with excellent reservoir-caprock assemblages outside the source rocks, indicating near-source short-distance secondary migration and accumulation. Moreover, shale oil and tight oil are characterized by spatiotemporally orderly migration and accumulation, continuous composite accumulation, locally enriched sweet spots, vertically superimposed development and regional cluster distribution. Under the guide of the orderly composite accumulation model, a hundred-million-ton large oilfield has been discovered in the western Ganquan area, indicating that Chang 8 in Ordos Basin has huge unconventional petroleum resources. Delta front underwater distributary channel sandstones around the continental depression-type lake basin subsidence center and the alternate deposition areas of lacustrine mud shale and beach bar sandstones are the favorable development areas of shale oil and tight oil. © 2021, Editorial Office of ACTA PETROLEI SINICA. All right reserved.
Number of references: 42
Main heading: Sandstone
Controlled terms: Hydrocarbons - Petroleum reservoir evaluation - Quality control - Metamorphic rocks - Low permeability reservoirs - Proven reserves
Uncontrolled terms: Accumulation modes - Free state - Geological sweet spot - Migration and accumulation - Ordos Basin - Reservoir genesis - Reservoir-caprock assemblage - Source rocks - Sweet spot - Unconventional oil
Classification code: 482.2 Minerals - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 804.1 Organic Compounds - 913.3 Quality Assurance and Control
Numerical data indexing: Size 2.032E-01m
DOI: 10.7623/syxb202110002
Compendex references: YES
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41. Evaluation and application of poly(ethylene glycol) as lubricant in water-based drilling fluid for horizontal well in Sulige Gas Field

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Authors: Liu, Xiongxiong (1); Gao, Long (1, 2); Wang, Qingchen (3); Gu, Xuefan (1); Du, Weichao (1); Zhang, Jie (1, 2); Gang, Chen (1, 2)
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Publisher: John Wiley and Sons Ltd
Abstract: With the increasing amount of drilling of directional wells and large-displacement wells, high torque and high resistance have become critical problems. Therefore, high-performance and environment-friendly lubricants for water-based drilling fluid are urgently needed. In this paper, poly(ethylene glycol) 2000 (PEG) was used as a lubricant, and the lubricity, inhibition, compatibility and temperature resistance of the PEG lubricant were investigated. The results show that 0.1% (mass ratio) PEG in water-based drilling fluid can reduce the friction coefficient of mud cake by 44.5%. This PEG also has certain inhibition and temperature resistance. As PEG is used with other drilling fluid additives, the compatibility was good and the lubricity of drilling fluid can be improved effectively. The lubricating mechanism of PEG was explored and the results showed that the hydrophobic alkane chains in the PEG molecules were adsorbed on the surface of bentonite, forming a hydrophobic film on the friction surface, thereby forming a lubricating layer. Field application in Sulige Gas Field showed that the PEG lubricant has good lubricity and can meet the technical requirements of corresponding horizontal wells. © 2020 Society of Industrial Chemistry. © 2020 Society of Industrial Chemistry
Number of references: 48
Main heading: Polyethylene glycols
Controlled terms: Infill drilling - Additives - Ethylene glycol - Gas industry - Temperature control - Drilling fluids - Friction - Lubricants - Polyols - Horizontal wells - Hydrophobicity
Uncontrolled terms: Drilling fluid additives - Environment friendly - Friction coefficients - Industrial chemistry - Lubricating mechanism - Technical requirement - Temperature resistances - Water based drilling fluids
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 522 Gas Fuels - 607.1 Lubricants - 731.3 Specific Variables Control - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 1.00e-01%, Percentage 4.45e+01%
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Funding Details: Number: 18JS089, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: YCS19111011, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2017ZX05069004, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: 2019ZDLGY06#03, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project; Number: -, Acronym: -, Sponsor: National Science and Technology Major Project;
Funding text: This work was supported financially by National Science and Technology Major Project of China (no. 2017ZX05069004), Shaanxi Provincial Key Research and Development Program (no. 2019ZDLGY0603), Scientific Research Program Funded by Shaanxi Provincial Education Department (no. 18JS089) and Postgraduate Innovation Fund Project of Xi'an Shiyou University (YCS19111011). We are grateful for the work of Modern Analysis and Testing Center of Xi'an Shiyou University.This work was supported financially by National Science and Technology Major Project of China (no. 2017ZX05069004), Shaanxi Provincial Key Research and Development Program (no. 2019ZDLGY06-03), Scientific Research Program Funded by Shaanxi Provincial Education Department (no. 18JS089) and Postgraduate Innovation Fund Project of Xi'an Shiyou University (YCS19111011). We are grateful for the work of Modern Analysis and Testing Center of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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42. Improvement of displacement efficiency in heavy oil reservoirs with enzyme

Accession number: 20212510517248
Authors: Shi, Yu (1, 2); Ding, Yanan (2); Feng, Qianghan (3); Yang, Daoyong (1, 2)

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Corresponding author: Yang, Daoyong(tony.yang@uregina.ca)
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Language: English
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CODEN: JERTD2
Document type: Journal article (JA)
Publisher: American Society of Mechanical Engineers (ASME)
Abstract: In this study, a systematical technique has been developed to experimentally and numerically evaluate the displacement efficiency in heavy oil reservoirs with enzyme under different conditions. First, dynamic interfacial tensions (IFTs) between enzyme solution and heavy oil are measured with a pendant-drop tensiometer, while effects of pressure, temperature, enzyme concentration, and contact time of enzyme and heavy oil on equilibrium IFT were systematically examined and analyzed. After waterflooding, enzyme flooding was carried out in sandpacks to evaluate its potential to enhance heavy oil recovery at high water-cut stage. Numerical simulation was then performed to identify the underlying mechanisms accounting for the enzyme flooding performance. Subsequently, a total of 18 scenarios were designed to simulate and examine effects of the injection modes and temperature on oil recovery. Except for pressure, temperature, enzyme concentration, and contact time are found to impose a great impact on the equilibrium IFTs, i.e., a high temperature, a high enzyme concentration, and a long contact time reduce the equilibrium IFTs. All three enzyme flooding tests with different enzyme concentrations show the superior recovery performance in comparison to that of pure waterflooding. In addition to the IFT reduction, modification of relative permeability curves is found to be the main reason responsible for further mobilizing the residual heavy oil. A large slug size of enzyme solution usually leads to a high recovery factor, although its incremental oil production is gradually decreased. In addition, temperature is found to have a great effect on the recovery factor of enzyme flooding likely owing to reduction of both oil viscosity and IFT. Copyright © 2021 by ASME.
Number of references: 37
Main heading: Crude oil
Controlled terms: Floods - Petroleum reservoirs - Enzymes - Heavy oil production - Petroleum reservoir engineering - Reservoirs (water) - Efficiency - Oil well flooding
Uncontrolled terms: Displacement efficiency - Dynamic interfacial tension - Enzyme concentrations - Heavy oil recovery - Heavy oil reservoirs - High temperature - Recovery performance - Relative permeability curves
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 913.1 Production Engineering
DOI: 10.1115/1.4050341
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Funding text: The authors acknowledge the fund from National Natural Science Foundation of China (Grant No. 52074222) to Y. Shi as well as a Discovery Development Grant, a Discovery Grant, and A Collaborative Research and Development (CRD) Grant from the Natural Sciences and Engineering Research Council (NSERC) of Canada to D. Yang and financial support from EHR Enhanced Hydrocarbon Recovery Inc. and Thermal Recovery Technologies Inc. The authors also highly appreciate the Biotech Processing Supply, LLC for providing the GreenZyme® sample and Y. Gu for providing the IFT measurement apparatus.The authors acknowledge the fund from National Natural Science Foundation of China (Grant No. 52074222) to Y. Shi as well as a Discovery Development Grant, a Discovery Grant, and A Collaborative Research and Development (CRD) Grant from the Natural Sciences and Engineering Research Council (NSERC) of Canada to D. Yang and financial support from EHR Enhanced Hydrocarbon Recovery Inc. and Thermal Recovery Technologies Inc. The authors also highly appreciate the Biotech Processing Supply, LLC for providing the GreenZyme? sample and Y. Gu for providing the IFT measurement apparatus.
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Database: Compendex
Data Provider: Engineering Village
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43. Insights on factors causing differential enrichment of Chang 6 Member in Jiyuan area, Ordos Basin

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Title of translation: 6
Authors: Shi, Baohong (1, 2); Qin, Xinyu (1); Zhang, Caili (3); Liu, Wen (4); Liu, Gang (3); Shi, Chanyuan (3); Zhang, Lei (3); Yong, Zishu (1)
Author affiliation: (1) College of Earth Sciences & Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Provincial Key Lab of Hydrocarbon Accumulation Geology, Xi'an; 710065, China; (3) Exploration and Development Research Institute of Changqing Oilfield Branch Company Ltd., PetroChina, Xi'an; 710018, China; (4) Exploration Department of Changqing Oilfield Co., PetroChina, Xi'an; 710018, China
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Publisher: Editorial Department of Oil and Gas Geology
Abstract: The 6th Member of Yanchang Formation (Chang 6 Member) is a key target layer for petroleum exploration in Jiyuan area, Ordos Basin.The reservoirs of Chang 6 Member are characterized by large burial depth and complex oil-water contact, resulting in markedly differential distribution both vertically and laterally.In order to find out the factors causing the differential enrichment of reservoirs in the study area, we make a comparative analysis of the geological conditions based on core and casting thin section observation, formation testing, and geochemical analysis of inclusions and crude oil biomarker compounds.The results show that the key factors of differential enrichment are the source rock quality, type of sand bodies and physical properties of reservoirs.As a result, high-quality source rocks, favorable sand bodies and relatively high permeability, work in unison to generate the enriched zone of Chang 6 reservoirs.In the particular sedimentary environment, vertically speaking, the Chang 61 submember with the thickest sand bodies dominated by Type I and in steady lateral distribution, features larger radius of throats, better physical properties, high hydrocarbon abundance in the reservoirs; in planar view, sand bodies developed in the east and west of the study area, feature large thickness, favorable type, less argillaceous interlayers, and better physical properties.In addition, source rocks have large thickness and strong hydrocarbon generation capacity, so they are favorable play fairways with favorable source-reservoir configuration.While the sand bodies of large thickness in central Jiyuan area are characterized by multiple beds thin for each single, multiple argillaceous interlayers, strong reservoir heterogeneity, and the source rocks are thin, so although the reservoirs therein are of better physical properties, their oil-bearing properties are poor, with most wells producing water. © 2021, OIL & GAS GEOLOGY Editorial Board. All right reserved.
Number of references: 34
Main heading: Metamorphic rocks
Controlled terms: Crude oil - Oil bearing formations - Analytical geochemistry - Petroleum reservoir engineering - Physical properties - Clay minerals - Hydrocarbons - Sand - Petroleum prospecting
Uncontrolled terms: Chang 6 member - Differential enrichment - Enrichment factors - Jiyuan area - Ordos Basin - Reservoir distribution - Sand body - Source rocks - Study areas - Yanchang Formation
Classification code: 481.2 Geochemistry - 482.2 Minerals - 483.1 Soils and Soil Mechanics - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 801 Chemistry - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.11743/ogg20210509
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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44. Research on microstructure and hardness of AISI1050 disk based on FDM and FEM methods during quenching process (*Open Access*)

Accession number: 20212110381361
Authors: Zhang, Yishuai (1); Fu, Jia (2); Sun, Hongxing (1, 3); Liu, Hua (1)

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Source title: Journal of Physics: Conference Series
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Issue: 2
Issue title: 2021 7th International Conference on Manufacturing Technology and Applied Materials, ICAMMT 2021 - 1. Research on Advanced Manufacturing Technology and Process Performance
Issue date: April 28, 2021
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Conference name: 2021 7th International Conference on Manufacturing Technology and Applied Materials, ICAMMT 2021
Conference date: March 26, 2021 - March 28, 2021
Conference location: Sanya, China
Conference code: 168830
Publisher: IOP Publishing Ltd
Abstract: Microstructures of AISI1050 disk during quenching were simulated by DEFORM-HT, and corresponding parameters of mechanical properties were investigated by applying the algorithm of finite difference method (FDM). Above all, thermo-physical parameters and diagrams of CCT curve were calculated by JMATPRO. Besides, the simulation of multi-phase microstructure considering initial thermo-physical parameters was realized by DEFORM-HT. The volume fraction of single phase were obtained by the FDM method, and then a weight function considering carbon equivalent of phases was introduced to predict the final hardness of multi-phase and according to the quenched microstructure and independent single phase hardness simulated. Temperature field, stress field and microstructure change of an AISI1050 disk under different quenching processes were studied by using the DEFORM-HT software numerical simulation calculation, combined with the continuous cooling transition curve (CCT curve) of AISI1050 steel. The martensite transformation of the disk tread during the quenching process can increase the wear resistance. According to the actual working conditions combined with the CCT curve of AISI1050 steel, the hardness of the disk rim surface is 54.8 HRC, which can meet the requirements of 51-56 HRC. It is concluded that the maximum equivalent stress of the disk(the equivalent stress after unloading is the residual stress) is distributed near the disk inner layer in the inside of the plate to hand over the location. The microstructure of the specimen is observed and compared with the simulation results, which prove that the simulation results are reliable. The simulated hardness by using both JMATPRO and DEFORM-HT can provide some basis to predict the hardness on certain degree. © Published under licence by IOP Publishing Ltd.
Number of references: 31
Main heading: Microstructure
Controlled terms: Wear resistance - Unloading - Computer software - Finite difference method - Finite element method - Quenching - Hardness - Manufacture
Uncontrolled terms: Carbon equivalent - Continuous cooling - Finitedifference methods (FDM) - Martensite transformations - Microstructure changes - Multiphase microstructure - Numerical simulation calculation - Thermo-physical parameters
Classification code: 537.1 Heat Treatment Processes - 691.2 Materials Handling Methods - 723 Computer Software, Data Handling and Applications - 913.4 Manufacturing - 921.6 Numerical Methods - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1088/1742-6596/1885/2/022030
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45. Compact cascaded meta-surface system for controlling the spin and orbital angular momentum of electromagnetic fields simultaneously (*Open Access*)

Accession number: 20212510516474
Authors: YANG, PEI (1, 2); YANG, RUI (1); LI, YACHAO (3)
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Publication year: 2021
Pages: 20229-20239
Language: English
E-ISSN: 10944087
Document type: Journal article (JA)
Publisher: The Optical Society
Abstract: We propose a compact cascaded meta-surface system (CCMS) to produce well converged orbital angular momentum (OAM) vortex waves with tailored spin angular momentum (SAM) by integrating a meta-surface lens (ML) with an assistant meta-mirror (AM). Specifically, the co-linearly polarized (LP) waves from the feed would be reflected by the ML firstly and then twisted into the cross-LP counterparts by the AM to penetrate the ML for the perfect synthesis of the OAM vortex beams while performing the linear-to-circular polarization conversion. Especially, the CCMS can pack the ML and the AM closely together with a quarter of the ML focal length when we apply proper phase distributions on the AM. In addition, the proposed CCMS can readily be extended to the generation of multiple circularly polarized OAM vortex waves with different modes. Our design should thus pave the way for building up more efficient wireless communication systems with expanded channel capacity. © 2021 Optical Society of America.
Number of references: 35
Main heading: Vortex flow
Controlled terms: Angular momentum - Electromagnetic fields - Circular polarization
Uncontrolled terms: Circularly polarized - Linearly polarized - Orbital angular momentum - Phase distribution - Polarization conversion - Spin angular momentum - Surface systems - Wireless communication system
Classification code: 631.1 Fluid Flow, General - 701 Electricity and Magnetism - 701.1 Electricity: Basic Concepts and Phenomena - 711 Electromagnetic Waves
DOI: 10.1364/OE.428494
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Open Access type(s): All Open Access, Gold
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Data Provider: Engineering Village
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46. Prediction of solid holdup in a gassolid circulating fluidized bed riser by artificial neural networks

Accession number: 20211010054981
Authors: Zhong, Hanbin (1); Sun, Zeneng (2); Zhu, Jesse (1); Zhang, Chao (3)
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Source title: Industrial and Engineering Chemistry Research

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CODEN: IECRED
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: The artificial neural network (ANN) method was applied to predict the solid holdup in a gassolid circulating fluidized bed (CFB) riser. All the possible ANNs were first developed by looping the hidden neurons from the minimum (3) to the maximum (number of training data) and performing 500 independent runs for the same ANN structure. Then, an improved rule for finding the best ANN was proposed with the help of the expected range of the predicted solid holdup based on the existing data under training conditions. The accuracy of the prediction for test conditions was significantly enhanced by using the improved rule. The reproducibility and applicability of the proposed ANN development process were fully examined by repeating several times on the same sample and applying to different samples, respectively. © 2021 American Chemical Society. All rights reserved.
Number of references: 21
Main heading: Neural networks
Controlled terms: Fluidized beds - Forecasting - Fluidized bed process
Uncontrolled terms: Circulating fluidized bed riser - Development process - Hidden neurons - Reproducibilities - Solid holdup - Test condition - Training conditions - Training data
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Compendex references: YES
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47. Discussion on the applicability of Th/U ratio for evaluating the paleoredox conditions of lacustrine basins

Accession number: 20214411091427
Authors: Cao, Lei (1, 2, 3, 4); Zhang, Zhihuan (3, 4); Zhao, Jingzhou (1, 2); Jin, Xiao (3, 4, 7); Li, Hui (5); Li, Jiayang (3, 4); Wei, Xiaodi (1, 2, 6)
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Publication year: 2021
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Language: English
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Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In recent 30 years, Th/U ratio has been using widely in evaluating the paleoredox conditions during the depositions of source rocks. However, there are few studies on the preconditions of the use of Th/U ratio for evaluating the paleoredox conditions. In many areas, the evaluation results of redox conditions in paleoenvironment obtained by Th/U ratio is different from that reflected by other parameters. The accuracy of judgment of paleoredox conditions by

Th/U ratio is questioned. In this paper, the weathering degree of source rocks during the deposition are determined by chemical index of alteration (CIA) and Al2O3-CaO, NaO-K2O (A-CN-K) ternary diagram, whereas the lithologies of parent rocks during source rocks depositions are determined by A-CN-K ternary diagram, Al2O3/TiO2 ratio and REEs. Furthermore, the effects of the weathering degree, the properties of parent rocks and sedimentation rate on Th/U ratio to evaluate the accuracy of paleoredox conditions are analyzed. The results show that in lacustrine basins, although the content of uranium (U) gradually increased with the decrease of oxygen content in the water column, the obvious enrichment of thorium (Th) in sediments because of parent rock undergoing strong weathering and relative fast sedimentation rate influences the accuracy of Th/U ratio for evaluating the paleoredox conditions. Additionally, the different initial content of U, Th and Th/U ratio in different lithologies also influence the accuracy of Th/U ratio for evaluating the paleoredox conditions. The distribution characteristics of Th/U ratio are the result of the comprehensive influence of various conditions, not just paleoredox condition. When evaluating the redox condition of paleolake water by the enrichment factors of redox sensitive elements (RSEs) and bimetal ratio, the effect of weathering, lithologies of parent rocks and sedimentation rate should be taken into consideration on distributions of parameters. © 2021 Elsevier B.V.
Number of references: 89
Main heading: Rocks
Controlled terms: Weathering - Sodium compounds - Alumina - Sedimentation - Aluminum oxide
Uncontrolled terms: Condition - Lacustrine basins - Lithology of parent rock, sedimentation rate - Paleoredox condition - Redox condition - Sedimentation rates - Source rocks - Thorium/U ratio - Weathering conditions - Weathering degree
Classification code: 802.3 Chemical Operations - 804.2 Inorganic Compounds
Numerical data indexing: Age 3.00E+01yr
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Database: Compendex
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48. The corrosion resistance of engineered cementitious composite (ECC) containing high-volume fly ash and low-volume bentonite against the combined action of sulfate attack and dry-wet cycles

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Authors: Quan, Xiaoyi (1); Wang, Sheliang (1); Liu, Kangning (1); Zhao, Nan (2); Xu, Jin (3); Xu, Fan (1); Zhou, Jie (4)
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Corresponding author: Zhao, Nan(yn_11221188@126.com)
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Language: English
ISSN: 09500618
CODEN: CBUMEZ
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: This study aims to investigate the corrosion resistance of engineered cementitious composite (ECC) containing high-volume fly ash and low-volume bentonite against the combined action of sulfate attack and dry-wet cycles. The fly ash/cement ratios (FA/C) were 1.2, 1.8, and 2.4. The amounts of bentonite blended in the ECCs of each FA/C were 0%, 3%, and 6% by mass. The specimens were immersed in 10% sodium sulfate solutions (S), 10% magnesium sulfate solutions (M), and water (W) for 150 dry-wet cycles. The pore fluid distribution and three-dimensional pore distribution of the specimens were observed with nuclear magnetic resonance (NMR) and industrial

computed tomography (CT); the compressive strength and relative dynamic modulus of elasticity (RDME) of the specimens were measured every 25 dry-wet cycles; The microstructures of the ECC were observed with a scanning electron microscope (SEM) after 150 dry-wet cycles. The results showed that the corrosion resistance of the ECC decreased with the increase of FA/C. In contrast, adding bentonite improved the pore structure and the performance of the ECC. Analysis of the interactions between fly ash and bentonite revealed that the ECC with a FA/C of 1.8 and a bentonite content of 3% is highly corrosion resistant. Moreover, the corrosion resistance of ECC is related to the coupling effects of sulfate corrosion and dry-wet cycles. Sulfate exerted has negative and positive effects on the ECC before and after the 75th dry-wet cycle. After 150 dry-wet cycles, the corrosion resistance of ECC from highest to lowest is the ones immersed in W>in M>in S. © 2021 Elsevier Ltd
Number of references: 57
Main heading: Corrosion resistance
Controlled terms: Magnesium compounds - Pore structure - Sulfur compounds - Fly ash - Nuclear magnetic resonance - Sodium sulfate - Compressive strength - Computerized tomography - Bentonite - Scanning electron microscopy
Uncontrolled terms: Combined actions - Dry-wet cycle - Engineered cementitious composites - Fly ash cements - High volume fly ash - Magnesium sulfate solution - Pore fluid distribution - Sulfate attack - Sulfate solutions - Three-dimensional pores
Classification code: 482.2 Minerals - 539.1 Metals Corrosion - 723.5 Computer Applications - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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49. Influence of differential structural deformation on shale reservoirs: A case study of the lower Silurian Longmaxi Shale in north Guizhou, Southern China

Accession number: 20211910335746
Authors: Gu, Yang (1, 2); He, Jianhua (3); Xu, Sheng (1, 2); Tian, Qianning (1, 2); Zhang, Wei (1, 2); Yin, Shuai (4)
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Abbreviated source title: Geol. Mag.
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Publication year: 2021
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Language: English
ISSN: 00167568
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Document type: Journal article (JA)
Publisher: Cambridge University Press
Abstract: Southern China is affected by multi-stage tectonic activities, with strong fold deformation, complex fault systems and poor shale gas preservation conditions. Here, we used shale samples from the lower Silurian Longmaxi shale in the complex tectonic area of Southern China, to study the relationship between differential structural deformation, and pore structure and adsorption capacity. According to the deformation mechanism of the shale, it is

further divided into brittle-slip rheological deformation (BD) and ductile-slip rheological deformation (DD). The results show that all micro-fractures can be observed under scanning electron microscopy in deformed shale samples, but in shale samples with different types of rheological deformation, the micro-fractures have large differences in scale, fracture length and lateral connectivity. The micro-fractures developed in DD shales are small in scale and short in fracture length, but have strong local connectivity. In contrast, brittle minerals are more developed in BD shales, and interlayer shearing has formed micro-fractures with large fracture length and good lateral connectivity, which is beneficial for later fracturing. In these two types of deformed shales, pores in organic matter are rare, and sporadic organic pores have small pore size and poor connectivity. The total pore volume (1.8-2.4 × 10-2 cm3 g-1) of BD shale samples is higher than that of DD shale samples (0.8-1.6 × 10-2 cm3 g-1). There is a positive correlation between total pore volume and quartz content. In addition, the specific surface area (12-18 m2 g-1) of DD shale samples is larger than that of BD shale samples (6-12 m2 g-1). © The Author(s), 2020
Number of references: 43
Main heading: Scanning electron microscopy
Controlled terms: Pore size - Fracture - Deformation - Pore structure - Tectonics
Uncontrolled terms: Adsorption capacities - Complex fault system - Deformation mechanism - Local connectivity - Positive correlations - Preservation condition - Rheological deformation - Structural deformation
Classification code: 481.1 Geology - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Specific_Surface_Area 1.20e+04m2/kg to 1.80e+04m2/kg, Specific_Surface_Area 6.00e +03m2/kg to 1.20e+04m2/kg, Specific_Volume 1.00e-02m3/kg to 2.00e-03m3/kg
DOI: 10.1017/S0016756820000771
Funding Details: Number: 41072098,41372139, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: DD20190414, Acronym: CGS, Sponsor: China Geological Survey; Number: 2016ZX05034-004-003,2016ZX05046-003, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This research was supported by the National Natural Science Foundation of China (project nos 41072098 and 41372139), the National Major Science and Technology Specific Projects of China (nos 2016ZX05034-004-003 and 2016ZX05046-003) and the China Geological Survey Project (grant no. DD20190414).
Compendex references: YES
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50. Evaluation of Factors Influencing Energy Consumption in Water Injection System Based on Entropy Weight-Grey Correlation Method (*Open Access*)

Accession number: 20214711203677
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Pages: 269-280
Language: English
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Document type: Journal article (JA)
Publisher: Sciendo
Abstract: In order to determine the importance of influencing factors of energy consumption in oilfield water injection systems, the distribution of energy loss in the water injection system was analyzed, the factors affecting the energy consumption of the water injection system were determined, and an evaluation index system for the energy consumption of the water injection system was established. This indicator system covers all links and all energy loss nodes of the energy loss of the water injection system, thereby an evaluation model for influencing factors of energy consumption in water injection system based on entropy weight - grey correlation method was built. Use the entropy weight method to get the ranking of the importance of energy consumption indicators; use the gray correlation

method to determine the correlation between each water injection system and energy consumption factors. The application results show that the entropy weight-grey correlation method proposed in this paper can effectively obtain the importance of the energy consumption factors of the oilfield water injection system, and provide scientific guidance for the daily management and targeted optimization of the water injection system. © 2021 Ruan Yan et al., published by Sciendo.
Number of references: 26
Main heading: Energy utilization
Controlled terms: Energy dissipation - Entropy - Oil fields - Correlation methods
Uncontrolled terms: Energy-consumption - Entropy weight method - Entropy weights - Evaluation index - Grey correlation methods - Main controling factor of energy consumption - Main controlling factors - Oilfield water injection system - Oilfield waters - Water injection systems
Classification code: 512.1.1 Oil Fields - 525.3 Energy Utilization - 525.4 Energy Losses (industrial and residential) - 641.1 Thermodynamics - 922.2 Mathematical Statistics
DOI: 10.2478/amns.2021.2.00044
Funding Details: Number: YCS19213101, Acronym: -, Sponsor: -; Number: 2017CGZH-HJ-08, Acronym: -, Sponsor: -; Number: 52002315, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: Fund project: Supported by National Natural Science Foundation of China(52002315), Shaanxi Provincial Special Fund for Technological Innovation Guide(2017CGZH-HJ-08), Postgraduate innovation and practice ability training programme of Xi'an Shiyou University(YCS19213101).
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51. Hybrid variable selection strategy coupled with random forest (RF) for quantitative analysis of methanol in methanol-gasoline via Raman spectroscopy

Accession number: 20210409812150
Authors: Li, Maogang (1); Xu, Yanyan (1); Men, Jing (3); Yan, Chunhua (2); Tang, Hongsheng (1); Zhang, Tianlong (1); Li, Hua (1, 2)
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Corresponding author: Tang, Hongsheng(tanghongsheng@nwu.edu.cn)
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Language: English
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Abstract: With the trend of portable and miniaturization, Raman spectrometer requires more advanced analytical methods providing more rapid and accurate analysis performance for in-situ analysis. In this work, a hybrid variable selection method based on V-WSP and variable importance measurement (VIM) coupled with random forest (RF) was used to improve the quantitative analysis performance of portable laser Raman instruments for quantitative analysis of methanol content in methanol gasoline. First, five preprocessing methods were applied to reduce the infection information in the raw spectra, respectively. Based on the spectra data processed by multivariate scattering correction (MSC), V-WSP was employed to filter the infection or redundant information in Raman spectroscopy, and 579 variables were obtained when the correlation threshold is 0.9600. Then, the variables were further eliminated by VIM. Finally, 43 variables were obtained by the V-WSP-VIM method. In data processing, out of bag (OOB) error estimation and 10-flod cross validation (CV) were applied to optimize the parameters of preprocessing methods, V-WSP, VIM and RF model. The results fully demonstrated that compared with the RF model based on raw spectra, the RF model based on V-WSP-VIM method can achieve a better prediction performance for the quantitative analysis of methanol content in methanol-gasoline, with the coefficients of determination of cross-validation (R2CV) improving from 0.9100

to 0.9662, the root mean square error of cross-validation (RMSECV) reducing from 0.0572 to 0.0365%, the coefficients of determination of prediction set (R2P) improving from 0.9214 to 0.9407, the root mean square error of prediction set (RMSEP) reducing from 0.0420 to 0.0382%, the variables reducing from 1044 to 43 and the modeling time reducing from 72.94 to 6.41 s. The results indicates that V-WSP-VIM coupled with RF is an effective method to improve the performance of portable laser Raman spectrometer for quantitative analysis of methanol content in methanol gasoline. © 2021 Elsevier B.V.
Number of references: 32
Main heading: Raman spectroscopy
Controlled terms: Errors - Methanol - Forecasting - Spectrum analysis - Decision trees - Gasoline - Random forests - Data handling - Mean square error
Uncontrolled terms: Correlation threshold - Laser raman spectrometers - Pre-processing method - Prediction performance - Root mean square errors - Root-mean-square error of predictions - Scattering corrections - Variable importances
Classification code: 523 Liquid Fuels - 723.2 Data Processing and Image Processing - 723.4.2 Machine Learning - 804.1 Organic Compounds - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.2 Mathematical Statistics - 961 Systems Science
Numerical data indexing: Percentage 4.20e-02% to 3.82e-02%, Percentage 5.72e-02% to 3.65e-02%, Time 7.29e+01s to 6.41e+00s
DOI: 10.1016/j.saa.2021.119430
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52. A multi-sensor weighted least squares weighted fusion method for attitude measurement of near-bit drilling tool

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Title of translation:
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CODEN: SYHPD9
Document type: Journal article (JA)
Publisher: Science Press
Abstract: The high-speed rotation and strong vibration during drilling cause the centrifugal acceleration and vibration acceleration to be superimposed on signals of the triaxial inertial accelerometer used for measuring the attitude of the drilling tool, which leads to serious distortions in the attitude measurement results of tools. Aiming at the attitude measurement system constituted by the triaxial inertial accelerometer, triaxial fluxgate and angular rate gyroscope, this paper proposes an attitude measurement method based on multi-sensor weighted fusion.Two sets of reference values of the accelerometer signals are obtained by inverse solution using such characteristics as insensitivity of the latter two sets of sensors to vibration and slow variations of hole deviation angle during drilling. Then the weight coefficients of each set of signals participating in the fusion are determined according to the weighted least squares, so

that the variance of fusion results is minimized. The effectiveness of the method is verified by simulation experiment. The combined experiment of vibration and speed fluctuation at 1.5°hole deviation shows that all indicators of the calculation accuracy of hole deviation angle are significantly improved, and the tool face angle presents an obvious periodical change with the tool rotation. It indicates that the weighted fusion method can effectively improve the measurement accuracy of the dynamic attitude of drilling tools. © 2021, Editorial Office of ACTA PETROLEI SINICA. All right reserved.
Number of references: 25
Main heading: Gyroscopes
Controlled terms: Inverse problems - Accelerometers - Infill drilling - Rotation
Uncontrolled terms: Accelerometer signals - Attitude measurement - Calculation accuracy - Centrifugal acceleration - Inertial accelerometers - Measurement accuracy - Vibration acceleration - Weighted least squares
Classification code: 511.1 Oil Field Production Operations - 931.1 Mechanics - 943.1 Mechanical Instruments
DOI: 10.7623/syxb202104007
Compendex references: YES
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Data Provider: Engineering Village
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53. Interstitial matter and its impact on reservoir development in Chang 6 deepwater tight sandstone in Huaqing area, Ordos Basin

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Title of translation: 6
Authors: Chen, Zhaobing (1, 2); Zhao, Zhenyu (3); Fu, Ling (3); Gao, Jianrong (3); Song, Wei (3); Chen, Xinjing (4)
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Language: Chinese
ISSN: 02539985
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Publisher: Editorial Department of Oil and Gas Geology
Abstract: Unconventional tight sandstone reservoir resulting from deepwater gravity flow, as a new hotspot for hydrocarbon exploration and development, has attracted much attention.The deepwater depositional environment is characterized by complex hydrodynamics, resulting in large variation in type and content of interstitials, and strong heterogeneity of reservoirs under microscopic observation, thus challenging petroleum E&P. In this study, an integration of casting thin section and SEM observation, Quantitative Evaluation of Materials by Scanning Electron Microscopy (QEMSCAN), electron microprobe and nano CT analysis, is applied to finely characterize the microscopic features of various interstitial matter in the deepwater tight sandstone of the 6th member of Yanchang Formation (Chang 6 Member) in Huaqing area, Ordos Basin, and discuss the effects of interstitials on reservoir pore structure and physical properties.The results show that the matrix is not completely tight, which could, under diagenetic modification, generate a complex secondary pore network consisting of intercrystalline and dissolved pores with a pore size ranging between 20 nm and 1 000 nm.With a matrix content of less than or equal to 7%, the matrix contains well-developed secondary pores, which has a positive impact on reservoir quality; with a matrix content of greater than 7%, the secondary pore development is undermined, exacerbating reservoir compaction. The intercrystalline pores in clay mineral cements, however, could alleviate the reduction of porosity to some extent; on the other hand, the morphology, occurrence of different clay minerals, and their effect on reservoir sensitivity, function to increase the complexity of clay mineral-permeability relationship. In areas with high content of illite, I/S mixed layer and thick chlorite, the reservoirs are commonly poor in physical properties; while high-quality reservoirs are most seen in areas of well-developed kaolinite. Carbonate and siliceous cements are key in undermining the physical properties of deepwater tight sandstone reservoirs. In all, the area with a matrix content of 7% or less and relatively well-developed kaolinite

cement is a focus for the exploration and development of tight sandstone reservoirs of deepwater facies. © 2021, OIL & GAS GEOLOGY Editorial Board. All right reserved.
Number of references: 40
Main heading: Scanning electron microscopy
Controlled terms: Computerized tomography - Pore structure - Tight gas - Gravitation - Kaolinite - Petroleum reservoir engineering - Sandstone - Complex networks - Quality control - Petroleum prospecting - Metamorphic rocks - Pore size
Uncontrolled terms: Deep-water facies - Deepwater - Deepwater gravity flow - Gravity flows - High quality reservoir - Huaqing area - Interstitial matter - Interstitials - matrix - Ordos Basin - Tight sandstone of deep water facies - Tight sandstones
Classification code: 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 722 Computer Systems and Equipment - 723.5 Computer Applications - 913.3 Quality Assurance and Control - 931.2 Physical Properties of Gases, Liquids and Solids - 931.5 Gravitation, Relativity and String Theory - 951 Materials Science
Numerical data indexing: Percentage 7.00E+00%, Size 0.00E00m, Size 2.00E-08m
DOI: 10.11743/ogg20210508
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54. Research on microstructure evolution and mechanical properties of steering shaft teeth after pre-heat treatment and carburizing-quenching processes (*Open Access*)

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Authors: Zhang, Yishuai (1); Wang, Tao (1); Fu, Jia (2); Sun, Hongxing (1, 3); Li, Jiqiang (1); Liu, Hua (1)
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Corresponding author: Fu, Jia(fujia@xsyu.edu.cn)
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Article number: 012051
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Document type: Conference article (CA)
Conference name: 2021 7th International Forum on Manufacturing Technology and Engineering Materials, IFEMMT 2021
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Conference code: 170474
Publisher: IOP Publishing Ltd
Abstract: The influence of pre-heat treatment and carburizing quenching on microstructure and properties in steering gear is studied. The CCT curve and TTT curve of 20CrMnTiH are calculated by JMatPro software. According to the phase transformation theory of undercooled austenite, the pre-heat treatment process is designed and the carburizing and quenching experiments are carried out in a gas carburizing furnace. Results show that the undercooled austenite begins to transform at 814.1 °C and shows unstable at 650 °C, at which the phase transformation speed is the fastest; By controlling the cooling rate of our designed air cooling system, transformation temperature and transformation time during the undercooled austenite transformation, the metallographic structure of axle teeth after pre-heat treatment can reach grade 1, with the brinell hardness distribution is 159HB-166HB and the hardness difference less than 7HB. After carburizing and quenching the carbide grade in the gear surface can reach to grade 1. The acicular martensite and retained austenite can also reach to grade 3. In the surface of the gear the hardness is 704HV. With the request

of the engineering technical standard of 0.7mm-0.9mm, the effective hardened layer depth is about 0.85 mm. This research provides a technical basis for the fatherly research on distortion characteristics. © Published under licence by IOP Publishing Ltd.
Number of references: 21
Main heading: Quenching
Controlled terms: Austenite - Microstructure - Carbides - Carburizing - Phase transitions
Uncontrolled terms: Hardened layer depth - Metallographic structure - Micro-structure evolutions - Microstructure and properties - Technical standards - Transformation temperatures - Undercooled austenite - Undercooled austenite transformations
Classification code: 531.2 Metallography - 537.1 Heat Treatment Processes - 801.4 Physical Chemistry - 804.2 Inorganic Compounds - 812.1 Ceramics - 951 Materials Science
Numerical data indexing: Size 7.00e-04m to 9.00e-04m, Size 8.50e-04m, Temperature 1.09e+03K, Temperature 9.23e+02K
DOI: 10.1088/1742-6596/1965/1/012051
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Open Access type(s): All Open Access, Bronze
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55. The spectral fusion of laser-induced breakdown spectroscopy (LIBS) and mid-infrared spectroscopy (MIR) coupled with random forest (RF) for the quantitative analysis of soil pH

Accession number: 20212010362509
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Corresponding authors: Zhang, Tianlong(tlzhang@nwu.edu.cn); Li, Hua(huali@nwu.edu.cn)
Source title: Journal of Analytical Atomic Spectrometry
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ISSN: 02679477
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CODEN: JASPE2
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Soil pH is one of the important properties of soil. The quick and accurate determination of soil pH is key to realizing precision agriculture and understanding soil characteristics and fertility. Previous research established a soil pH measurement method based on laser-induced breakdown spectroscopy (LIBS) technology combined with random forest (RF) (the determination coefficient of cross validation (Rc2) was 0.9995, the root mean square error of cross validation (RMSEC) was 0.0201; the determination coefficient of prediction (Rp2) was 0.9687, and the root mean square error of prediction (RMSEP) was 0.1285). This study explored the impact of three different spectral preprocessing methods (first derivative (D1st), multivariate scattering correction (MSC), and standard normal variation (SNV)) on the prediction performance of the RF correction model using 21 soil samples, as in the previous study. The input variables were optimized through variable importance thresholds. Then, a method was established based on mid-infrared (MIR) technology combined with RF for the qualitative analysis of soil pH (Rc2 = 0.9887, RMSEC = 0.0875, Rp2 = 0.9208, RMSEP = 0.1476, and the mean relative error (MRE) was 0.0168). Meanwhile, a soil pH measurement

method based on a LIBS-MIR spectral data fusion strategy combined with RF was further established. The results showed that the RF calibration model based on intermediate spectral data fusion showed better prediction abilities (Rc2 = 0.9997, RMSEC = 0.0163, Rp2 = 0.9809, RMSEP = 0.0645, and MRE = 0.0065). Compared with a spectral analysis method based on LIBS or MIR alone, this study provides new ideas and new methods for the rapid, accurate, and quantitative analysis of soil pH. © 2021 The Royal Society of Chemistry.
Number of references: 38
Main heading: Decision trees
Controlled terms: Near infrared spectroscopy - Soils - Spectrum analysis - Errors - Forecasting - Laser induced breakdown spectroscopy - Mean square error - Data fusion - Infrared devices - Atomic emission spectroscopy - Soil surveys - Infrared spectroscopy - Random forests
Uncontrolled terms: Determination coefficients - Laserinduced breakdown spectroscopy (LIBS) - Mid-infrared spectroscopy - Root mean square errors - Root-mean-square error of predictions - Scattering corrections - Spectral analysis method - Spectral preprocessing
Classification code: 483.1 Soils and Soil Mechanics - 723.2 Data Processing and Image Processing - 723.4.2 Machine Learning - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.2 Mathematical Statistics - 931.1 Mechanics - 961 Systems Science
DOI: 10.1039/d0ja00524j
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Compendex references: YES
Database: Compendex
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56. Shale Gas Exploration and Development in China: Current Status, Geological Challenges, and Future Directions

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Authors: Sun, Chuanxiang (1, 2); Nie, Haikuan (1, 2); Dang, Wei (3); Chen, Qian (2); Zhang, Guangrong (4); Li, Wangpeng (2); Lu, Zhiyuan (4)
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CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: The big success in marine shale gas exploration and production made China the third country worldwide to commercialize shale gas development. However, the Upper Ordovician Wufeng Formation and the Lower Silurian Longmaxi Formation in and around the Sichuan Basin are currently the only targets that have realized shale gas industrial development. Great challenges are emerging since tremendous shale gas resources of marine facies, continental facies, and transitional facies that are trapped in new areas and multiple other formations are yet to be successfully developed. Thus, we find it a great necessity to provide suggestions on shale gas exploration and

development in China, which hopefully can be helpful for global shale gas exploitation. To meet this goal, this work provides a critical review on the history and current status of China's shale gas exploration and development and summarizes key practical experiences. In the light of characteristic analysis of typical industrial gas fields and wells, research status, problems and challenges, along with suggestions on pivotal scientific issues are addressed including the development of organic-rich shales, reservoir types and characteristics, shale gas content, and the main controlling factors on shale gas enrichment. Further, future directions of shale gas exploration and development are nailed down, incorporating three levels: areas to improve development technology, areas to seek exploration breakthrough, and areas to conduct preliminary studies. The normal-pressure and deep shale gas retained in the Wufeng and Longmaxi Formations in and around the Sichuan Basin are the first level, which are the most realistic resources that can be commercially developed. For the normal-pressure shale gas, detailed research on the sweet spot selection, drilling-encounter ratio enhancement, and cost minimization by advanced technologies are most imperative; for the deep shale gas, state-of-the-art technology to maximize the stimulated reservoir volume of lateral wells is the key. Gas resources in other shale formations in the Sichuan Basin and its periphery such as the Cambrian marine shales, Permian transitional shales, and Jurassic continental shales are the second level, which have the greatest prospective to claim exploration breakthroughs, while shale gas resources in other basins or regions still demand grand scientific and technological tasks for exploration and development preparation. All in all, as a country with diverse shale gas types and such intricate geological and surface conditions, the summary of China's shale gas exploration and development practices is of vital significance that will not only shed light on China's shale gas development directions but also provide references for the shale gas industry in other countries and regions. © 2021 American Chemical Society.
Number of references: 204
Main heading: Shale gas
Controlled terms: Energy resources - Geological surveys - Geology - Petroleum prospecting - Industrial research - Gases - Gas industry
Uncontrolled terms: Characteristic analysis - Development technology - Exploration and development - Industrial development - Main controlling factors - Problems and challenges - State-of-the-art technology - Stimulated reservoir volumes
Classification code: 481.1 Geology - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 525.1 Energy Resources and Renewable Energy Issues - 901.3 Engineering Research - 912.1 Industrial Engineering
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Funding text: This study is jointly supported by the National Natural Science Foundation of China "Study on the evolution characteristics shale reservoir in the Longmaxi Formation, Sichuan Basin" (Grant No. 41872124), "Neoproterozoic glacial events and ancient source rock development in the periphery of the Tarim Basin" (Grant No. 41902149), and "The large-scale enrichment effect of hydrocarbons in the one-way diverging-converging process in the Tethys region" (Grant No. 91755211). We express our profound gratitude to the Sinopec Petroleum Exploration and Production Research Institute, Jianghan Oilfield Branch, Oil and Gas Exploration Branch, and East China Oil and Gas Branch for providing necessary materials. Our great thanks also go to academician Xu Chen from the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, for providing important guidance on the knowledge of graptolite zone and the identification methods.
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57. Enhanced mechanical and tribological properties of graphene nanoplates reinforced TC21 composites using spark plasma sintering

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Abstract: Graphene nanoplates (GNPs) reinforced TC21(Ti-6Al-2Sn-2Zr-3Mo-1Cr-2Nb-Si) (GNPs/TC21) composites were prepared by using spark plasma sintering (SPS). Microstructure, mechanical and tribological properties of the sintered GNPs/TC21 composites were systematically investigated. Microstructural observations demonstrated the formation of a special sandwich interface product is in-situ TiC coated GNPs (TiC@GNPs) bands and TiC particles/plates in the microstructure of the sintered GNPs/TC21 composites. Results of mechanical testing indicated the excellent combination of strength and ductility of GNPs/TC21 composites owing to the dispersion strengthening effects of TiC particles/plates as well as the load transfer between TiC@GNPs bands and TC21 matrix. GNPs/TC21 composite with 0.05 wt% GNPs addition exhibits the relatively excellent mechanical properties, i.e., yield strength of 1017.2 MPa, ultimate tensile strength of 1161.99 MPa and an elongation about 13.2%. Among them, the dispersion strengthening effect of TiC particles/plate was the dominant factor in 0.05 wt% GNPs /TC21 composites. When the GNPs content exceeds 0.1 wt%, TiC particles/plates and TiC@GNPs bands formed at grain boundaries. The excellent combination of strength and ductility of GNPs/TC21 composites owing to the dispersion strengthening effects of TiC particles/plates as well as the load transfer between TiC@GNPs bands and TC21 matrix. Furthermore, additions of GNPs have significantly improved the tribological properties of the sintered GNPs/TC21 composites. The wear loss of 0.05 wt% GNPs/TC21 composite decreased by 21% compared to that of the sintered TC21 alloy. The superior mechanical and tribological performances of GNPs/TC21 composites can be attributed to the unique strengthening effect and the lubricating efficiency of GNPs. This demonstrates that GNPs is an ideal filler for TC21 matrix composites, as the effective lubricant and favorable reinforcement. © 2021 Elsevier B.V.
Number of references: 38
Main heading: Graphene
Controlled terms: Ductility - Reinforcement - Silicon - Aluminum compounds - Dispersions - Microstructure - Spark plasma sintering - Well testing - Grain refinement - Niobium compounds - Tensile strength - Titanium carbide - Tribology - Nanostructures - Grain boundaries - Silicon compounds
Uncontrolled terms: Dispersion strengthening - Graphene nanoplate - Mechanical - Mechanical and tribological properties - Nano-Plate - Property - Spark-plasma-sintering - Strengthening effect - TiC particles - Tribological properties
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 761 Nanotechnology - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 931 Classical Physics; Quantum Theory; Relativity - 933 Solid State Physics - 951 Materials Science
Numerical data indexing: Percentage 1.32E+01%, Percentage 2.10E+01%, Pressure 1.0172E+09Pa, Pressure 1.16199E+09Pa
DOI: 10.1016/j.jallcom.2021.159764
Funding Details: Number: 2020KJXX-061, Acronym: -, Sponsor: -; Number: U1737108, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was performed under the support of the Nation Natural Science Foundation of China (No. U1737108), Shaanxi Youth Star Program of Science and Technology (No. 2020KJXX-061).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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58. A two-dimensional cantilever beam vibration sensor based on fiber Bragg Grating

Accession number: 20210309776251
Authors: Jia, Zhen'an (1, 2, 3, 4); Zhao, Xianfeng (1, 2, 3, 4); Fan, Wei (1, 2, 3, 4); Gao, Hong (1, 2, 3, 4); Liu, Qinpeng (1, 2, 3, 4); Yong, Zhen (1, 2, 3, 4); Liu, Yinggang (1, 2, 3, 4); Yang, Kaiqing (1, 2, 3, 4)
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Source title: Optical Fiber Technology
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Article number: 102447
Language: English
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CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: A two-dimensional cantilever vibration sensor based on Fiber Bragg Grating (FBG) is proposed. The proposed sensor consists of a section of optical fiber with double FBGs and three different beams. After theoretical analysis and experimental verification, the proposed sensor has a high sensitivity response. The experimental result shows that the natural frequency of the sensor in the x/y direction of vibrations is respectively 505/177 Hz. The flat frequency of the sensor is 60–150 Hz and 30–150 Hz, respectively. And the sensor's sensitivity is respectively 125.85/82.32 pm/g in the x/y direction of vibration. Compared with the traditional cantilever beam FBG sensor, the proposed sensor has the advantages of multi-directional detection, avoiding chirp and so on. Therefore, it has great application prospects in two-dimensional vibration signal detection of bridges, roads and buildings. © 2020 Elsevier Inc.
Number of references: 15
Main heading: Fiber Bragg gratings
Controlled terms: Nanocantilevers - Cantilever beams - Ventilation exhausts
Uncontrolled terms: Application prospect - Beam vibration - Cantilever vibrations - Directional detections - Experimental verification - FBG sensor - High sensitivity - Vibration signal
Classification code: 408.2 Structural Members and Shapes - 619.1 Pipe, Piping and Pipelines - 643.5 Ventilation - 761 Nanotechnology - 933 Solid State Physics
DOI: 10.1016/j.yofte.2020.102447
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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59. Evaluation of pore structure characteristics of four types of continental shales with the aid of low-pressure nitrogen adsorption and an improved FE-SEM technique in Ordos Basin, China

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Authors: Xie, Xinhui (1); Deng, Hucheng (1, 3); Fu, Meiyan (1, 3); Hu, Lanxiao (1, 2, 3); He, Jianhua (1, 3)
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Corresponding author: Deng, Hucheng(denghucheng@cdut.edu.cn)
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Article number: 108018
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: The upper Triassic continental shale of Yan-Chang #7 Formation, in Ordos Basin, China, exhibits complex geological conditions that lead to a complicated pore structure of the targeted formation. To reveal the pore structure and understand its influential factors, we first classify the shale samples into four categories according to the organic

and clay contents (type #1: clay contentÂ >Â 52.0% and TOCÂ >Â 3.0%, type #2: clay content >52% and TOCÂ Â 3.0%, type #4: clay contentÂ © 2020 Elsevier B.V.
Number of references: 44
Main heading: Pore structure
Controlled terms: Clay minerals - Size distribution - Nitrogen - Pore size - Quartz - Shale - Enamels - Field emission microscopes - Metamorphic rocks - Specific surface area - Feldspar - Gas adsorption - Scanning electron microscopy
Uncontrolled terms: Complex geological condition - Field emission scanning electron microscopy - Influential factors - Nitrogen adsorption - Ordos basin , China - Structure characteristic - Surface porosity - Total pore volume
Classification code: 482.2 Minerals - 741.3 Optical Devices and Systems - 802.3 Chemical Operations - 804 Chemical Products Generally - 813.2 Coating Materials - 922.2 Mathematical Statistics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 3.00e+00%, Percentage 5.20e+01%
DOI: 10.1016/j.petrol.2020.108018
Funding Details: Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: PLC2020041,KFJJ-TZ-2019-4, Acronym: -, Sponsor: -; Number: 14TD0008, Acronym: -, Sponsor: -;
Funding text: Project Grants support this research to Scientific Research Innovation Team of Universities Affiliated to Sichuan Province [No: 14TD0008] to the second author (H. Deng), Open Fund of Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs [No: KFJJ-TZ-2019-4] and Open Fund (PLC2020041) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation to the fourth author (L. Hu). We gratefully acknowledge these supports.
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60. High sensitivity fiber-optic temperature sensor based on PDMS glue-filled capillary

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Authors: Liu, Yinggang (1, 2); Huang, Liang (1); Dong, Jingfei (1); Li, Bowen (1); Song, Xiaoya (1)
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Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: A high sensitivity fiber-optic sensor based on temperature-sensitive material is proposed and demonstrated experimentally. The sensor consists of single-mode fiber (SMF), silicon capillary tube (SCT) and polydimethylsiloxane (PDMS) film, where the PDMS glue is filled into the SCT and s a temperature-sensitive medium sensing cavity is formed at the end of the SMF. Due to its high thermal expansion and thermo-optic effects, the sensor structure is more sensitive response to the change of ambient temperature. The experiment results demonstrate that the maximum temperature sensitivity of our proposed sensor is 3.449 nm/°C in temperature range of 34–48 °C, and the linearity of fitting curve is 99.9%. Compared with the same structure but filled with ultraviolet (UV) glue, the PDMS-based sensor not only has much higher temperature sensitivity, but also has better stability and repeatability. For the new type of sensor composed of optical fiber microstructure and sensitive material, the proposed sensor structure can increase the measurement temperature range. The sensor structure is simple to fabricate, stable in structure, and possessing good repeatability, which has great potential applications in the temperature sensing fields. © 2021 Elsevier Inc.
Number of references: 18
Main heading: Polydimethylsiloxane

Controlled terms: Curve fitting - Silicones - Glues - Silicon - Fiber optic sensors - Single mode fibers - Gluing - Thermal expansion - Capillarity - Fabry-Perot interferometers - Fiber optics - Microchannels - Temperature sensors
Uncontrolled terms: Fiber optic temperature sensor - Fibre-optic sensor - High sensitivity - Polydimethylsiloxane - Sensor structures - Silicon capillary tube - Single-mode fibers - Temperature range - Temperature sensitive - Temperature-sensitive materials
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 631.1 Fluid Flow, General - 641.1 Thermodynamics - 741.1.2 Fiber Optics - 815.1.1 Organic Polymers - 921.6 Numerical Methods - 941.3 Optical Instruments - 944.5 Temperature Measuring Instruments - 951 Materials Science
Numerical data indexing: Percentage 9.99E+01%, Size 3.449E-09m, Temperature 3.21E+02K
DOI: 10.1016/j.yofte.2021.102699
Funding Details: Number: YCS20211074, Acronym: -, Sponsor: -; Number: 61805197, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2013JM8032, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 20JS122, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work was supported by the National Natural Science Foundation of China (Grant No. 61805197), Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2013JM8032), Scientific Research Program Funded by Shaanxi Provincial Education Department of China (Grant No. 20JS122) and Graduate Student Innovation Fund of Xi'an Shiyou University (Grant No. YCS20211074).This work was supported by the National Natural Science Foundation of China (Grant No. 61805197), Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2013JM8032), Scientific Research Program Funded by Shaanxi Provincial Education Department of China (Grant No. 20JS122) and Graduate Student Innovation Fund of Xi'an Shiyou University (Grant No. YCS20211074).
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61. Advancement and trends of shale gas reservoir characterization and evaluation

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Title of translation:
Authors: Wang, Ruyue (1); Hu, Zongquan (1); Dong, Li (1); Gao, Bo (1); Sun, Chuanxiang (1); Yang, Tao (2); Wang, Guanping (3); Yin, Shuai (4)
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Language: Chinese
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Document type: Journal article (JA)
Publisher: Editorial Department of Oil and Gas Geology
Abstract: Breakthroughs in shale gas exploration and development are inseparable from advancement in exploration theories and technologies.The complex micro-nano scale pore systems prevalent in shale and the unique occurrence of shale gas that distinguishes itself from conventional gases require the characterization of shale gas reservoirs to be more pertinent, accurate and applicable in terms of evaluation objects, methods and techniques.On the basis of a thorough investigation on shale gas reservoir characterization and evaluation status quo around the world, this paper focuses on the advancement of such technologies as lithofacies division and prediction, mineral composition and pore structure analyses, fracability evaluation and multi-scale/technique integration.It proposes that future shale gas reservoir characterization and evaluation pivots around (1) accuracy and pertinence enhancement; (2) further integration of multiple-scale techniques; (3) in-situ condition; (4) dynamic monitoring and assessment; and (5) application of big data.In view of geological conditions, exploration and development practices of shale gas in China, the paper again proposes four aspects as the focuses of future shale gas reservoir characterization and evaluation: (1) fine-grained sedimentary characteristics; (2) temporal and spatial evolution traits; (3) fracability evaluation of reservoirs;

as well as (4) integration of different technologies, introduction of foreign technologies, and most of all, innovation. © 2021, OIL & GAS GEOLOGY Editorial Board. All right reserved.
Number of references: 68
Main heading: Pore structure
Controlled terms: Integration - Petroleum prospecting - Gases - Petroleum reservoirs - Nanotechnology - Shale gas
Uncontrolled terms: Evaluation objects - Exploration and development - Geological conditions - Mineral composition - Sedimentary characteristics - Shale gas reservoirs - Structure analysis - Temporal and spatial evolutions
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 761 Nanotechnology - 921.2 Calculus - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.11743/ogg20210105
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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62. Influence of Water-Cement Ratio and Type of Mixing Water on the Early Hydration Performance of Calcium Sulphoaluminate (CSA) Cement (*Open Access*)

Accession number: 20212310461044
Authors: Wang, Chuanlin (1, 2, 3); Song, Meimei (4)
Author affiliation: (1) Department of Civil and Environmental Engineering, Shantou University, Shantou; 515063, China; (2) Key Laboratory of Structure and Wind Tunnel of Guangdong Higher Education Institutes, Shantou; 515063, China; (3) Guangdong Engineering Center for Structure Safety and Health Monitoring, Shantou University, Shantou; 515063, China; (4) Department of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Song, Meimei(mmsong@xsyu.edu.cn)
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Issue date: 2021
Publication year: 2021
Article number: 5557763
Language: English
ISSN: 16878434
E-ISSN: 16878442
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: The present work studies the influence of water-cement ratio and types of mixing water on the hydration process and microstructure of calcium sulphoaluminate (CSA) cement. Experimental tests on the setting time, physical properties, compressive strength, chemical shrinkage, X-ray diffraction (XRD), and scanning electron microscopy (SEM) of CSA cement paste were carried out. The XRD analysis confirmed that the main hydration product is ettringite in both freshwater and seawater mixed CSA cement with different w/c ratios. The SEM analysis and physical properties test show that both low w/c ratio and seawater can improve the microstructure of CSA cement. The test results also find out that the high w/c ratio can accelerate the hydration process, extend the setting time, lower the compressive strength, and increase the chemical shrinkage of CSA cement, and the seawater presents a similar influence except for the mechanical property. The seawater increases the compressive strength of CSA cement in the early stage of hydration but will increase the microcracks at the later hydration stage of CSA cement and reduce its mechanical properties. © 2021 Chuanlin Wang and Meimei Song.
Number of references: 41
Main heading: Compressive strength
Controlled terms: Calcium compounds - Scanning electron microscopy - Mixing - Setting - X ray diffraction - Hydration - Cements - Microcracks - Shrinkage - Microstructure
Uncontrolled terms: Calcium sulphoaluminate - Chemical shrinkage - Experimental test - Hydration process - Hydration products - Influence of water - SEM analysis - Setting time
Classification code: 412.1 Cement - 802.3 Chemical Operations - 951 Materials Science
DOI: 10.1155/2021/5557763
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Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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63. Sequence stratigraphy, sedimentary characteristics of barrier coastal sedimentary system of the Benxi Formation (Gaoqiao area, Ordos basin) and favorable reservoir distribution (*Open Access*)

Accession number: 20220311476272
Authors: Xu, Xin (1, 2); Liu, Linyu (1, 2); Li, Xijun (3); Yang, Wenjing (3); Cao, Yangang (3); Ma, Hao (3); He, Anan (3); Wang, Ruyang (3); Leng, Hanbing (3); Zhu, Yushuang (1, 2); Chen, Zhaobing (4)
Author affiliation: (1) State Key Laboratory of Continental Dynamics of Ministry of Geology, Northwest University, Xi'an; 710069, China; (2) Department of Geology, Northwest University, Xi'an; 710069, China; (3) No.6 Gas Production Plant, PetroChina Changqing Oilfiled Company, Xi'an; 710018, China; (4) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Zhu, Yushuang(yshzhu@nwu.edu.cn)
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Volume: 7
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Pages: 5316-5329
Language: English
E-ISSN: 23524847
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Benxi Formation is an abundant natural gas reservoir in Gaoqiao area. Therefore, it is essential to analyze the sequence and sedimentary characteristics of the Benxi Formation to predict the distribution of favorable gas reservoirs. After the comprehensive use of the core, thin section, drilling, and logging data, the sequence framework, sedimentary microfacies, planar distribution and vertical microfacies associations of the Benxi formation were studied. The Benxi Formation in the Gaoqiao area is barrier coastal sedimentary system, which is divided into eight sedimentary microfacies, namely, tidal delta, tidal channel, sand flat, mixed flat, mud flat, peat flat, barrier bar, and lagoon mud microfacies. In addition, we concluded that i) From west to east, peat flat, mud flat, mixed flat, sand flat, lagoon mud, and barrier bar have been developed in the study area. ii) Four typical vertical sequences were identified: MA1, MA2, MA1, and MA4. The first three sequences developed extensively and completely in the study area, whereas the last one generally has one or more microfacies missing. iii) The sedimentary system of the Benxi Formation in the Gaoqiao area was primarily vulnerable to tectonism, sequence, and sea-level changes. The Second Member was the target gas-producing stratum of the Formation. Both barrier bar and sand flat microfacies exhibited an excellent gas display. However, the barrier bar microfacies were the most favorable natural gas distribution zones with giant and premium gas reserves. © 2021 The Authors
Number of references: 62
Main heading: Tight gas
Controlled terms: Gases - Peat - Proven reserves - Metamorphic rocks - Sedimentology - Petroleum reservoirs - Sea level - Natural gas - Stratigraphy
Uncontrolled terms: Barrier coastal sedimentary system - High frequency HF - High-frequency sequence - Micro-facies - Ordos Basin - Sedimentary characteristics - Sedimentary micro-facies - Sedimentary systems - The benxi formation - Tight gas exploration
Classification code: 471.1 Oceanography, General - 481.1 Geology - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 524 Solid Fuels
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Open Access type(s): All Open Access, Gold
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64. An intelligent dynamic analysis system for oil and gas reservoirs based on custom components (*Open Access*)

Accession number: 20212110392502
Authors: Haoyu, Zhang (1); Zhigao, Mao (2); Ying, Ning (2)
Author affiliation: (1) Xi'An Shiyou University Shaanxi, Key Laboratory of Well Stability and Fluid and Rock Mechanics in Oil and Gas• Reservoirs, Xi an, China; (2) China National Petroleum Corporation Digitalization and Technology, Information Center of the Third Oil Production Plant of Changqing, Oilfield Branch, Yin chuan, China
Corresponding author: Haoyu, Zhang(zhyflyl987@qq.com)
Source title: Journal of Physics: Conference Series
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: This paper introduces an intelligent dynamic analysis system of reservoir with components. The system has 6 modules: production early warning, report analysis, single well dynamic analysis, injection-production well group dynamic analysis, reservoir dynamic analysis, and intelligent knowledge base. The system data comes from the production data lake, monitors the production status of the reservoir in real time, and USES the conventional production warning and big data analysis warning to report the warning to users. Researchers can use the system's three-stage dynamic analysis module to process and resolve the corresponding warning information to maintain the normal production of the field. The system adopts component development, divides the commonly used algorithms and drawings for reservoir dynamic analysis into three categories of components. Each component can be independently applied to a specific scenario by connecting to the database. Through the configuration of free page XML, each component can quickly form different analysis scenarios in an adaptive way, so as to meet the complex and changeable requirements of reservoir geology and production, and better help oil field enterprises to reduce cost and increase efficiency. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Knowledge based systems
Controlled terms: Oil field development - Petroleum reservoir engineering - Petroleum reservoirs
Uncontrolled terms: Knowledge base - Oil and gas reservoir - Production data - Production wells - Reservoir dynamics - Reservoir geology - Three categories - Warning informations
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 723.4.1 Expert Systems
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Open Access type(s): All Open Access, Bronze
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65. Molecular dynamics study of coupled layer thickness and strain rate effect on tensile behaviors of Ti/Ni multilayered nanowires

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Authors: Su, Meng-Jia (1, 2); Deng, Qiong (1, 2); Liu, Lan-Ting (1, 2); Chen, Lian-Yang (1, 2); Su, Meng-Long (3); An, Min-Rong (4)
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Corresponding authors: Deng, Qiong(dengqiong24@nwpu.edu.cn); An, Min-Rong(amrlr@163.com)
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Article number: 096201
Language: English
ISSN: 16741056
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Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: Novel properties and applications of multilayered nanowires (MNWs) urge researchers to understand their mechanical behaviors comprehensively. Using the molecular dynamic simulation, tensile behaviors of Ti/Ni MNWs are investigated under a series of layer thickness values (1.31, 2.34, and 7.17 nm) and strain rates (1.0×108 s-1 #e ≤5.0×1010 s-1). The results demonstrate that deformation mechanisms of isopachous Ti/Ni MNWs are determined by the layer thickness and strain rate. Four distinct strain rate regions in the tensile process can be discovered, which are small, intermediate, critical, and large strain rate regions. As the strain rate increases, the initial plastic behaviors transform from interface shear (the shortest sample) and grain reorientation (the longest sample) in small strain rate region to amorphization of crystalline structures (all samples) in large strain rate region. Microstructure evolutions reveal that the disparate tensile behaviors are ascribed to the atomic fractions of different structures in small strain rate region, and only related to collapse of crystalline atoms in high strain rate region. A layer thickness-strain rate-dependent mechanism diagram is given to illustrate the couple effect on the plastic deformation mechanisms of the isopachous nanowires. The results also indicate that the modulation ratio significantly affects the tensile properties of unequal Ti/Ni MNWs, but barely affect the plastic deformation mechanisms of the materials. The observations from this work will promote theoretical researches and practical applications of Ti/Ni MNWs. © 2021 Chinese Physical Society.
Number of references: 47
Main heading: Molecular dynamics
Controlled terms: Nanowires - Plastic deformation - Strain rate
Uncontrolled terms: Coupled layer thickness-strain rate effect - Layer thickness - Multilayered nanowires - Plastic deformation mechanisms - Rate regions - Strain rate effect - Strain-rates - Tensile behaviors - Thickness strain - Ti/ni multilayered nanowire
Classification code: 761 Nanotechnology - 801.4 Physical Chemistry - 933 Solid State Physics
Numerical data indexing: Size 7.17E-09m, Time 1.01E+03s, Time 1.08E+02s
DOI: 10.1088/1674-1056/ac1e22
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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66. Research progress of heterogeneous Fenton catalyst for organic wastewater treatment (*Open Access*)

Accession number: 20210910008117
Authors: Zhang, Xin (3); Zhang, Qiaosheng (1, 2); Yang, Tao (1, 2); Li, Yanfang (1, 2); Li, Jinling (3); Yu, Tao (3); Qu, Chengtun (3)
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Corresponding author: Qu, Chengtun(Wangshuangct@yeah.net)
Source title: IOP Conference Series: Earth and Environmental Science
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Issue: 4
Issue title: 3rd International Conference on Green Energy and Sustainable Development - Number 4
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Language: English
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Conference code: 167246
Sponsor: CCCC Second Harbour Engineering Company Ltd.; Chishun Chemical; Wanxiang Group Technology Center
Publisher: IOP Publishing Ltd
Abstract: The catalytic degradation of organic wastewater by heterogeneous Fenton has attracted much attention in recent years. Compared with homogeneous Fenton, heterogeneous Fenton reaction has the advantages of wide pH range, low dissolved iron content after reaction, easy magnetic separation and good reusability. This paper mainly introduces the research progress of heterogeneous supported Fenton catalyst in the treatment of organic wastewater in recent years. In this paper, the degradation performance and recyclability of organic wastewater by catalysts are discussed, and the development direction of catalysts in the future is prospected. © Published under licence by IOP Publishing Ltd.
Number of references: 29
Main heading: Magnetic separation
Controlled terms: Catalysts - Oxidation - Reusability - Wastewater treatment
Uncontrolled terms: Catalytic degradation - Development directions - Dissolved iron - Heterogeneous fenton - Organic wastewater - Organic wastewater treatment - Recyclability - Wide pH range
Classification code: 452.4 Industrial Wastes Treatment and Disposal - 701.2 Magnetism: Basic Concepts and Phenomena - 708.4 Magnetic Materials - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
DOI: 10.1088/1755-1315/651/4/042025
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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67. Composite removal of iron and calcium technology for gas field produced water

Accession number: 20212610570702
Title of translation: ,
Authors: Zhang, Ao (1); Fang, Jianyu (2); Liu, Bo (1); Zhao, Xuangang (3); Huang, Li (1); Huang, He (1); Ran, Liangtao (1); Su, Biyun (1)
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Corresponding author: Su, Biyun(subiyun@xsyu.edu.cn)
Source title: Huagong Jinzhan/Chemical Industry and Engineering Progress

Abbreviated source title: Huagong Jinzhan/Chem. Ind. Eng. Prog.
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Issue: 6
Issue date: June 5, 2021
Publication year: 2021
Pages: 3091-3098
Language: Chinese
ISSN: 10006613
Document type: Journal article (JA)
Publisher: Materials China
Abstract: According to the analysis of water quality and scale deposits of distillation tower in the pretreatment process, the iron and calcium content exceed the standard, which leads to the accumulation of scale in water conveyance equipment and pipeline and the corrosion under the scale at the same time, which affects the normal operation of the produced water treatment equipment in the gas field. Considering that the majority of treatment plants only consider removing iron ions, but do not consider removing Ca2+, this paper combines the removal technology of iron and Ca2+ in the produced water pretreatment for the first time, and optimized addition sequence, reaction time, standing time by selecting suitable iron and calcium removal agents. The composite iron and calcium removal technology suitable for gas field produced water treatment has been developed. The results showed that the on-site dosage was H2O2 500mg/L, NaOH 500mg/L, PAC 50mg/L, PAM 4mg/L, the molar ratio of calcium removal to Ca2+ was 1:1. The order of the agents was Na2CO3#H2O2#NaOH#PAC#PAM. The reaction time was more than 7min. The standing time was more than 5h. The total iron ion content in the produced water of the gas field can be reduced from 153.24mg/L to 0.3338mg/L, Ca2+ from 5495mg/L to 520mg/L, of which iron ion decreases by 99.8%, Ca2+ decreases by 90.54%. Salinity substantial reduction can avoid blockage, thereby ensure the efficient operation of the gas field produced water treatment system. © 2021, Chemical Industry Press Co., Ltd. All right reserved.
Number of references: 14
Main heading: Produced Water
Controlled terms: Molar ratio - Chemicals removal (water treatment) - Pipeline corrosion - Water quality - Iron - Sodium Carbonate - Metal ions - Sodium hydroxide - Gas industry - Distillation - Gases
Uncontrolled terms: Calcium content - Distillation towers - Normal operations - Pretreatment process - Substantial reduction - Treatment plants - Water conveyance - Water pretreatment
Classification code: 445.2 Water Analysis - 452.3 Industrial Wastes - 522 Gas Fuels - 531.1 Metallurgy - 539.1 Metals Corrosion - 545.1 Iron - 801.4 Physical Chemistry - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Mass_Density 1.53e-01kg/m3 to 3.34e-04kg/m3, Mass_Density 4.00e-03kg/m3, Mass_Density 5.00e-01kg/m3, Mass_Density 5.00e-02kg/m3, Mass_Density 5.50e+00kg/m3 to 5.20e-01kg/m3, Percentage 9.05e+01%, Percentage 9.98e+01%, Time 1.80e+04s, Time 4.20e+02s
DOI: 10.16085/j.issn.1000-6613.2020-1296
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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68. Research of a Surfactant Gel with Potential Application in Oilfield

Accession number: 20214211039531
Title of translation: Erforschung eines Tensidgels mit potentieller Anwendung auf dem Ölfeld
Authors: Gao, Minlan (1); Tian, Wen (1); Ma, Zhihui (1); Dong, Sanbao (1, 2); Ke, Congyu (1); Zhang, Jie (1); Chen, Gang (1, 2)
Author affiliation: (1) Shaanxi Prov. Key Lab. of Environ. Poll. Control and Reservoir Protection Technology of Oilfields, College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) State Key Laboratory of Petroleum Pollution Control, Cnpc Research Institute of Safety and Environmental Technology, Beijing; 102206, China
Corresponding author: Chen, Gang(gangchen@xsyu.edu.cn)
Source title: Tenside, Surfactants, Detergents
Abbreviated source title: Tenside Surfactants Deterg
Volume: 58
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Issue date: 2021
Publication year: 2021
Pages: 360-370
Language: English

ISSN: 09323414
CODEN: TSDEES
Document type: Journal article (JA)
Publisher: Walter de Gruyter GmbH
Abstract: In this study, a viscoelastic surfactant gel was composed using erucoylamine propyl betaine and other additives. The formulation of this viscoelastic surfactant gel solution was determined as: erucamide propyl betaine:oleic acid amide propyl betaine:octadecyl hydroxyl sulfonate betaine = 1.7%:1.36%:0.01%. Then the performance of viscoelastic surfactant gel fluid was evaluated. The results showed that the viscoelastic surfactant gel has good temperature resistance and salt resistance. At 50°C, the apparent viscosity reaches the maximum value, 37 mPa · s, and it displays high shear resistance under the shear rate of 170 s-1, with the viscosity retention of 83.3%. Kerosene (1%) can completely break the gel within 2 h, which can convert the gel into a surfactant solution soon. Also the gel shows high emulsion ability, which can benefit the oil displacement in oilfield. Finally this gel can enhance the oil displacement rate as high as 28%. © 2021 Walter de Gruyter GmbH, Berlin/Boston, Germany.
Number of references: 29
Main heading: Emulsification
Controlled terms: Betaines - Viscosity - Amides - Additives - Viscoelasticity
Uncontrolled terms: Erucamide - Gel solutions - Octadecyl - Oil displacement - Performance - Salt resistance - Sulphonates - Temperature resistances - Viscoelastic gels - Viscoelastic surfactants
Classification code: 631.1 Fluid Flow, General - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 1.00E-02%, Percentage 1.00E00%, Percentage 1.36E+00%, Percentage 1.70E+00%, Percentage 2.80E+01%, Percentage 8.33E+01%, Pressure 3.70E-05Pa, Temperature 3.23E+02K, Time 1.70E+02s, Time 7.20E+03s
DOI: 10.1515/tsd-2020-2315
Funding Details: Number: 201805038YD16CG22, Acronym: -, Sponsor: -; Number: 50874092, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: The work was supported financially by Xi'an Science and Technology Planning Project (201805038YD16CG22(3)), National Science Foundation of China (50874092) and The Youth Innovation Team of Shaanxi Universities. And we thank the work of Modern Analysis and Testing Center of Xi'an Shiyou University.The work was supported financially by Xi'an Science and Technology Planning Project (201805038YD16CG22(3)), National Science Foundation of China (50874092) and The Youth Innovation Team of Shaanxi Universities. And we thank the work of Modern Analysis and Testing Center of Xi`an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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69. Effects of modulation ratio on the microstructure, mechanical and tribological properties of WB2/Cr multilayer films deposited by magnetron sputtering

Accession number: 20211510193459
Authors: Shi, W.B. (1, 2); Liu, Y.M. (3); Li, W.H. (1, 2); Liu, J.H. (1, 2); Lei, H. (1); Gong, J. (1); Sun, C. (1)
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Corresponding author: Sun, C.(csun@imr.ac.cn)
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Language: English
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Publisher: Elsevier Ltd

Abstract: WB2/Cr multilayer films with different modulation ratios (λ = 1, 3, 5, 7, 12, and 20) were deposited by a combination of direct-current and pulse direct-current magnetron sputtering, and the number of bilayers was fixed at ten. The effect of the modulation ratio on the microstructure, mechanical and tribological properties of the multilayer films was investigated in detail. X-ray diffraction demonstrates that a preferred orientation of WB2 (101) and Cr (110) exists, and WB2 (101) dominates the film's growth with increasing of modulation ratio. The TEM results show that the multilayer films consist of nanograins dispersed in an amorphous matrix in WB2 layers and polycrystalline grains in Cr layers. The hardness increases with the increasing modulation ratio, and the maximum hardness (31.1 GPa) is obtained at λ = 20. The indentation toughness presents an opposite changing trend, and the maximum indentation toughness (1.264 MPa m1/2) is obtained in S1 at λ = 1 which conforms to the rule of mixture due to the relatively thick bilayer thickness (Λ = 160–192 nm). The wear mechanism is investigated, and the results suggest that the multilayer film with λ = 7 possesses the best wear resistance (2.06 × 10-7 mm3/Nm), benefiting from the balance of hardness and indentation toughness. © 2021 Elsevier Ltd and Techna Group S.r.l.
Number of references: 44
Main heading: Multilayers
Controlled terms: Microstructure - Tribology - Wear resistance - Hardness - Modulation - Wear of materials - Indentation - Magnetron sputtering - Multilayer films
Uncontrolled terms: Direct current magnetron sputtering - Direct-current - Indentation toughness - Magnetron-sputtering - Mechanical and tribological properties - Microstructure mechanical properties - Modulation ratio - Multilayers films - Tribological behaviour - WB2/cr multilayer
Classification code: 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Pressure 1.264E+06Pa, Pressure 3.11E+10Pa, Size 1.92E-07m, Size 7.00E-03m
DOI: 10.1016/j.ceramint.2021.03.305
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70. Heterogeneous degradation of oil field additives by Cu(II) complex-activated persulfate oxidation

Accession number: 20204809562538
Authors: Tang, Ying (1); Zhou, Ling (1); Xu, Zhongying (1); Zhang, Jie (1, 2); Qu, Chengtuan (1, 2); Zhang, Zhifang (3)
Author affiliation: (1) Shaanxi Province Key Laboratory of Environmental Pollution Control and Reservoir Protection Technology of Oilfields, Xi'an Shiyou University, Xi'an, China; (2) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing, China; (3) School of Chemistry and Chemical Engineering, Yulin University, Yulin, China
Corresponding author: Tang, Ying(tangying78@xsyu.edu.cn)
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Publication year: 2021
Article number: e13562
Language: English
ISSN: 19447442
E-ISSN: 19447450
CODEN: ENVPDI
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: In this work, bentonite-supported Cu(II) complex (B@Cu(II)L) was prepared by a one-pot method and used as a heterogeneous catalyst for evaluating its catalytic activity in oxidation degradation of hydroxypropyl guar gum (HPGG) in oilfield wastewater. All of the reaction parameters effected degradation efficiency, such as Na2S2O8 concentration, catalyst amount, reaction temperature, and pH value, were investigated in detail. The results showed that the absolute viscosity of HPGG solution can be decreased from 15 to 1.48 mm2/s in presence of 15% Na2S2O8 (mass ratio to HPGG) and 1.5 g/L B@Cu(II)L at 45°C and pH = 10. It was also found that the chemical oxygen demand of HPGG solution catalyzed by B@Cu(II)L decreased from 4,080 to 584 mg/L after 240 min under the optimum

experimental conditions. The catalytic activity of supported bivalent copper complexes over bentonite was gradually decreased due to the loss of the active copper. © 2020 American Institute of Chemical Engineers
Number of references: 35
Main heading: Catalysis
Controlled terms: Sodium compounds - Copper compounds - Oil fields - Catalyst activity - Chemical oxygen demand - Catalytic oxidation - Additives - Degradation - Bentonite
Uncontrolled terms: Activated persulfate - Degradation efficiency - Experimental conditions - Heterogeneous catalyst - Hydroxypropyl guars - Oilfield wastewaters - Oxidation degradation - Reaction temperature
Classification code: 451.2 Air Pollution Control - 482.2 Minerals - 512.1.1 Oil Fields - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
Numerical data indexing: Mass_Density 4.08e+00kg/m3 to 5.84e-01kg/m3, Temperature 3.18e+02K, Time 1.44e +04s
DOI: 10.1002/ep.13562
Funding Details: Number: 2017ZX05069004, Acronym: -, Sponsor: National Science and Technology Major Project; Number: 2019ZDLGY06#03, Acronym: -, Sponsor: -; Number: 18JS089, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 201805038YD16CG22, Acronym: -, Sponsor: -; Number: 2019GY#136, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department; Number: 2017ZX05069004, Acronym: -, Sponsor: National Science and Technology Major Project; Number: 2019ZDLGY06#03, Acronym: -, Sponsor: -; Number: 201805038YD16CG22, Acronym: -, Sponsor: -; Number: 2019GY#136, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department; Number: 18JS089, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: National Science and Technology Major Project, Grant/Award Number: 2017ZX05069004; Shaanxi Provincial Key Research and Development Program, Grant/Award Number: 2019ZDLGY0603; Scientific Research Plan Projects of Shaanxi Science and Technology Department, Grant/Award Number: 2019GY136; Scientific Research Program Funded by Shaanxi Provincial Education Department, Grant/Award Number: 18JS089; Xi'an Science and Technology Project, Grant/Award Number: 201805038YD16CG22(3) Funding informationThe work was supported financially by National Science and Technology Major Project (No. 2017ZX05069004), Shaanxi Provincial Key Research and Development Program (No. 2019ZDLGY0603), Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 18JS089), Scientific Research Plan Projects of Shaanxi Science and Technology Department (2019GY136), Xi'an Science and Technology Project (201805038YD16CG22(3)).
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Database: Compendex
Data Provider: Engineering Village
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71. Pitting corrosion behavior of metal materials and research methods (*Open Access*)

Accession number: 20210910008877
Authors: Wang, Fan (3); Shan, Qiaoli (1, 2); Zhang, Fan (1, 2); Lu, Feng (1, 2); Li, Jinling (3); Yu, Tao (3); Qu, Chengtun (3)
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Corresponding author: Qu, Chengtun(xianquct@yeah.net)
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Issue title: 3rd International Conference on Green Energy and Sustainable Development - Number 3
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Article number: 032039
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Conference name: 3rd International Conference on Green Energy and Sustainable Development, GESD 2020
Conference date: November 14, 2020 - November 15, 2020
Conference location: Shenyang City, Virtual, China

Conference code: 167246
Sponsor: CCCC Second Harbour Engineering Company Ltd.; Chishun Chemical; Wanxiang Group Technology Center
Publisher: IOP Publishing Ltd
Abstract: Pitting corrosion occurs easily in metal pipelines containing corrosive media, which leads to premature failure of pipelines, oil, gas and water leakage, and increases the risk of environmental pollution. In this paper, the conditions of metal pitting, several nucleation mechanisms, growth and repassivation processes of metal metastable pitting are summarized. Corrosion electrochemical measurement technology can reflect the behavior characteristics of metal materials in the process of corrosion. The application of pitting of metal materials in the medium is introduced by using such electrochemical measurement techniques as polarization curve, electrochemical impedance spectrum, electrochemical noise and scanning electrochemical microscope. © Published under licence by IOP Publishing Ltd.
Number of references: 19
Main heading: Pitting
Controlled terms: Metals - Corrosive effects - Electrochemical corrosion - Leakage (fluid) - Pipelines - Water pollution - Pipeline corrosion
Uncontrolled terms: Behavior characteristic - Electrochemical impedance spectra - Electrochemical measurements - Electrochemical noise - Environmental pollutions - Nucleation mechanism - Polarization curves - Scanning electrochemical microscopes
Classification code: 453 Water Pollution - 539.1 Metals Corrosion - 619.1 Pipe, Piping and Pipelines - 801.4.1 Electrochemistry - 802.2 Chemical Reactions
DOI: 10.1088/1755-1315/651/3/032039
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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72. Performance improvement of FBG sensors based on the pre-stressed package technique

Accession number: 20212710578463
Authors: Feng, Dequan (1, 2); Luo, Xiaodong (2, 3); Liu, Yinggang (2); Ma, Chengju (2); Qiao, Xueguang (1)
Author affiliation: (1) School of Physics, Northwest University, No. 229, Taibai Road, Xi'an; 710069, China; (2) School of Science, Xi'an Shiyou University, No. 18, DianZiEr Road, Yan-Ta Zone, Xi'an; 710065, China; (3) Shaanxi Normal University, School of Physics and Information Technology, No. 620, XiChangAn Street, Chang-An Zone, Xi'an; 710119, China
Corresponding author: Qiao, Xueguang(xgqiao@nwu.edu.cn)
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Volume: 65
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Publication year: 2021
Article number: 102623
Language: English
ISSN: 10685200
CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: Packaging technology is a key factor in fiber Bragg grating (FBG) sensing, which can greatly affect the sensing performance of FBG sensors. In this paper, a pre-stressed packaging method for FBG sensors is proposed. The method enables the pre-stress applied on the FBG to be continuously and accurately adjusted when the FBG sensor is packaged, thereby ensuring the stability of the pre-stress. In order to implement the method, an instrument is designed and fabricated as well. The proposed method is demonstrated through some experiments, experimental researches indicate that using the proposed method, the spectrums of the fourteen packaged FBG sensors have no chirping nor broadening the spectral 3 dB bandwidth. The average temperature-dependent sensitivity coefficient of fourteen sensors is 2.03 × 10-5/, the relative error is 1.7%, and the average linearity is better than 0.999. So, the proposed pre-stressed packaging method has advantages of great stability, good repeatability, easy operation and low cost. © 2021 Elsevier Inc.
Number of references: 20
Main heading: Fiber Bragg gratings
Controlled terms: Packaging - Electric sensing devices

Uncontrolled terms: Experimental research - In-fiber Bragg gratings - Packaged FBG sensors - Packaging methods - Packaging technologies - Sensing performance - Sensitivity coefficient - Temperature dependent
Classification code: 694.1 Packaging, General - 732 Control Devices
Numerical data indexing: Decibel 3.00e+00dB, Percentage 1.70e+00%
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Compendex references: YES
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73. Recent advances in polysaccharides from Lentinus edodes (Berk.): Isolation, structures and bioactivities

Accession number: 20211810300169
Authors: Sheng, Kangjia (1, 2); Wang, Cuiling (2); Chen, Bitao (1); Kang, Meijuan (3); Wang, Minchang (4); Liu, Ke (4); Wang, Ming (1)
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Corresponding author: Wang, Ming(wangming@nwu.edu.cn)
Source title: Food Chemistry
Abbreviated source title: Food Chem.
Volume: 358
Issue date: October 1, 2021
Publication year: 2021
Article number: 129883
Language: English
ISSN: 03088146
E-ISSN: 18737072
CODEN: FOCHDJ
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Lentinus edodes, an important edible mushroom cultivated in East Asia for thousands of years, has been widely used as food and medicinal ingredient worldwide. Modern phytochemistry studies have demonstrated that L. edodes is very rich in bioactive polysaccharides, especially the β–glucans. Over the past two decades, the isolation, chemical properties, and bioactivities of polysaccharides from fruiting bodies, mycelium and fermentation broth of L. edodes have been drawing much attention from scholars around the world. It has been demonstrated that L. edodes polysaccharides possess various remarkable biological activities, including anti-oxidant, anti-tumor, anti-aging, anti-inflammation, immunomodulatory, antiviral, and hepatoprotection effects. This review summarizes the recent development of polysaccharides from L. edodes including the isolation methods, structural features, bioactivities and mechanisms, and their structure–activity relationship, which can provide useful research underpinnings and update information for their further application as therapeutic agents and functional foods. © 2021 Elsevier Ltd
Number of references: 113
Main heading: Polysaccharides
Controlled terms: Bioactivity - Mycelium
Uncontrolled terms: Antitumor mechanisms - Bioactive polysaccharides - East Asia - Edible mushroom - Glucans - Isolation structures - Lentinus edodes - Polysaccharides from Lentinus edodes - Structure-activity relationships - B–glucan
Classification code: 461.6 Medicine and Pharmacology - 461.8 Biotechnology - 804.1 Organic Compounds - 811.2 Wood and Wood Products - 815.1.1 Organic Polymers
DOI: 10.1016/j.foodchem.2021.129883
Funding Details: Number: 2018SF-077,2021JQ-460, Acronym: -, Sponsor: -;

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Compendex references: YES
Database: Compendex
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74. Simulation Estimation of BOD Content in Water Based on Hyperspectra

Accession number: 20211210125630
Title of translation: BOD
Authors: Wang, Hong-Wei (1); Wang, Bo (2); Ji, Tong (3); Xu, Jun (4); Ju, Feng (5); Wang, Cai-Ling (6)
Author affiliation: (1) Engineering University of CAPF, Xi'an; 710086, China; (2) Grassland Experiment Station of Yanchi, Yanchi; 751506, China; (3) College of Grass Industry, Gansu Agricultural University, Lanzhou; 730070, China; (4) Xi'an Aeronautical University, Xi'an; 710077, China; (5) Yinchuan Customs District P. R. China, Yinchuan; 750000, China; (6) Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Cai-Ling(azering@163.com)
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Document type: Journal article (JA)
Publisher: Science Press
Abstract: Due to the requirement of continuity and spectral separability, hyperspectral technology has the ability to distinguish different types of the same ground object, and the spectral data acquisition speed is fast, and the operation is simple. Spectral analysis has made outstanding achievements in monitoring water distribution and water indicators. Biochemical oxygen demandis one of the important indicators to evaluate water pollution, the current conventional measuring method for 5 culture method, and this method consumes reagent, complicated operation, more interference factors, determination of time is long, can not reflect the water quality changes in time, can't early warning of emergent water pollution events in a timely and effective manner, in view of the traditional methods of faults, explore the content of water, BOD estimation based on the technology of hyperspectral and inversion for water quality assessment is of great significance. This test three surface water in xi 'an area as the research area, a total of 60 sites, each site repeat 10 times spectra and the BOD value, average as an original spectrum and the BOD value, Person correlation coefficient method is used to filter the spectrum and the BOD value of sensitive wavebands, and principal component analysis and least square method are used to eliminate spectral index of multicollinearity, BOD water quality index of the multivariate linear regression model and partial least squares regression model. The results were as follows: (1) the BOD sensitive bands were generally distributed at 600~900 nm, and a total of 35 original spectral indicators with significant correlation were screened out, of which the absolute value of the correlation coefficient of 758 nm was the highest (0.418). (2) the accuracy of multiple linear regression model of Z1, Z2 and BOD indexes obtained by principal component analysis (R2=0.565, RMSE=0.007) is good, and the BOD concentration of 0~0.2 and 0.4~0.6 mol•L-1 can be clearly distinguished in the principal component analysis. (3) partial least-squares regression between spectral index and BOD index shows that the model accuracy R2 of the partial least-squares regression model is up to 0.896, RMSEP=0.746 9 (root mean square error with one crossing method). By jack test, it is found that 628 nm has a very significant influence on the BOD content of inversion water body, and the bands of 889 and 893 nm have a significant influence on it. (4) according to the model fitting accuracy, the selected optimal BOD inversion model is the partial least squares regression model, and the accuracy of the partial least squares model is verified to be good (R2=0.81). Based on the above test results, an inversion method based on partial least squares hyperspectral BOD parameters of water quality is proposed, which provides a new method for dynamic detection of water quality BOD parameters. © 2021, Peking University Press. All right reserved.
Number of references: 14
Main heading: Biochemical oxygen demand
Controlled terms: Oxygen - Spectrum analysis - Principal component analysis - Quality control - Water quality - Data acquisition - Linear regression - Water supply systems - Least squares approximations - Mean square error - Surface waters

Uncontrolled terms: Correlation coefficient method - Multiple linear regression models - Multivariate linear regression model - Partial least square (PLS) - Partial least squares models - Partial least squares regression - Partial least squares regression models - Water quality assessments
Classification code: 444.1 Surface Water - 445.2 Water Analysis - 446.1 Water Supply Systems - 723.2 Data Processing and Image Processing - 804 Chemical Products Generally - 913.3 Quality Assurance and Control - 921.6 Numerical Methods - 922.2 Mathematical Statistics
Numerical data indexing: Molar_Concentration 4.00e+02mol/m3 to 6.00e+02mol/m3, Size 6.00e-07m to 9.00e-07m, Size 6.28e-07m, Size 7.58e-07m, Size 8.89e-07m, Size 8.93e-07m
DOI: 10.3964/j.issn.1000-0593(2021)03-0978-06
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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75. Effects of TiO2/Bentonite on the Pyrolysis Process of Oily Sludge (*Open Access*)

Accession number: 20211310152001
Authors: Wang, Feifei (1, 2); Zhang, Huan (3); Du, Mingming (1); Li, Jinling (1); Yang, Penghui (1); Yu, Tao (1); Wang, Yijun (4); Qu, Chengtun (1, 2)
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Corresponding author: Qu, Chengtun(xianquct@163.comm)
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Abbreviated source title: Nat. Environ. Pollut. Technol.
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Language: English
ISSN: 09726268
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Document type: Journal article (JA)
Publisher: Technoscience Publications
Abstract: Oil sludge is one of the major industrial solid wastes from petroleum production and refining. Implementing the harmless and resource treatment of oily sludge is an urgent problem to be solved. In this paper, TiO2/bentonite was prepared by sol-gel method, which was characterized by scanning electron microscope (SEM), transmission electron microscope (TEM), X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS) and infrared spectroscopy (FT-IR), and then used in the pyrolysis process of oily sludge. The addition of TiO2/bentonite give the best quality of pyrolysis oil; maximum oil recovery was achieved when setting the pyrolysis condition at 420°C for final pyrolysis temperature, 3 h for reaction time, 10°C/min for heating rate, 100 mL/min for nitrogen flow rate and 1% for catalyst dosage. Compared with the non-catalyst, oil recovery rate can be increased from 76.06% to 84.16%, the oil content of the residue decreased from 2.23% to 1.36%. The pyrolysis recovery oil was analysed by GC-MC, and the fractions of pyrolysis oil C6-C15 were increased by 27.84%. This shows that the addition of TiO2/bentonite decreased the carbon residue, increased oil recovery and improved product quality. © 2021 Technoscience Publications. All rights reserved.
Number of references: 47
Main heading: Catalysts
Controlled terms: Titanium dioxide - Infrared spectroscopy - Sol-gels - Petroleum refining - Pyrolysis - Sol-gel process - X ray photoelectron spectroscopy - Transmission electron microscopy - Scanning electron microscopy
Uncontrolled terms: Carbon residue - Industrial solid wastes - Nitrogen flow rates - Oil recoveries - Petroleum production - Pyrolysis process - Pyrolysis temperature - Urgent problems
Classification code: 513.1 Petroleum Refining, General - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 812.3 Glass
Numerical data indexing: Percentage 1.00e+00%, Percentage 2.23e+00% to 1.36e+00%, Percentage 2.78e+01%, Percentage 7.61e+01% to 8.42e+01%, Temperature 6.93e+02K, Time 1.08e+04s
DOI: 10.46488/NEPT.2021.V20I01.001

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Funding text: This work was supported by the Open Project Program of State Key Laboratory of Petroleum Pollution Control; and Shaanxi Youth Science and technology new star project (2017KJXX-49); and Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No.18JS088); and Natural Science Basic Research Plan in Shaanxi Province of China (Program 2019JM-506)
Compendex references: YES
Open Access type(s): All Open Access, Gold
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76. Polyelectrolyte complex induced Stimuli-responsive Self-association and reinforcement of interpenetrated Poly(acrylamide-co-vinyl acetate)/alginate particles for fossil energy recovery

Accession number: 20214010970871
Authors: Pu, Jingyang (1, 2); Gu, Xiaoyu (3); Luo, Mingliang (1, 2); Bai, Yun (1)
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Corresponding author: Luo, Mingliang(mlluo@upc.edu.cn)
Source title: Journal of Molecular Liquids
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Issue date: December 1, 2021
Publication year: 2021
Article number: 117596
Language: English
ISSN: 01677322
CODEN: JMLIDT
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Stimuli-responsive poly(acrylamide-co-vinyl acetate)/alginate-based hydrogel particle (AIPNG particle) are obtained by free-radical polymerization of acrylamide monomer and vinyl acetate monomer which interpenetrates with branched polyethyleneimine (B-PEI)/alginate-based polyelectrolyte complex (PEC). The AIPNG particle is developed for reservoir conformance control in Ca-rich reservoirs. The AIPNG particle can swell 13 to 25 times its initial volume, and the equilibrium swelling ratio is dependent on brine type and concentration. The swelling and elastic modulus of the AIPNG particles are strongly influenced by salt in the aqueous solution. The release rate of B-PEI from B-PEI/alginate PEC structure, combining with the swelling ratio, the environmental temperature, and Ca2+ concentration, determines the self-association time and rheological strength of the AIPNG gel. Preparation pH influences the protonation degree of B-PEI and subsequently affects the self-association behavior by delaying the intermolecular transamidation reaction between poly(AM-co-VA) acrylamide pendant groups and PEI nitrogens. With the component adjustments, the self-association starting time can be controlled between 2 and 16 h depending on temperature and swelling ratio. Ca2+, supported from environmental brine, can influence the self-association time and help reinforce the re-formed bulk gel by forming Ca-alginate bonds and creating a hard Ca-shell on the gel surface. Field trial results in Zhidan oilfield demonstrated the potential of AIPNG particle products in high-salinity/middle-temperature reservoirs which provided a new way for maintaining the oil production and reducing water-cut in the mature oilfields. © 2021
Number of references: 49
Main heading: Free radicals
Controlled terms: Amides - Association reactions - Acrylic monomers - Oil fields - Polyvinyl acetates - Free radical polymerization - Hydrogels - Polyelectrolytes
Uncontrolled terms: Branched polyethyleneimine - Interpenetration - Poly(ethyleneimine) - Polyelectrolyte complexes - Responsive behaviour - Self-associations - Stimuli-responsive - Stimulus-responsive behavior - Swelling ratio - Transamidation reaction
Classification code: 512.1.1 Oil Fields - 801.3 Colloid Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 815.2 Polymerization - 817.1 Polymer Products

Numerical data indexing: Time 7.20E+03s to 5.76E+04s
DOI: 10.1016/j.molliq.2021.117596
Funding Details: Number: 20JK0829, Acronym: -, Sponsor: -; Number: 05TB2102004,27RA2102011, Acronym: -, Sponsor: -; Number: 2020JQ-787, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This work was supported by the Independent Innovation Research Project of China University of Petroleum (East China) Funding (grant number 27RA2102011), the Qingdao Postdoc. Application Funding (grant number 05TB2102004), the Natural Science Basic Research Plan in Shaanxi Province of China (grant number 2020JQ-787), and the Scientific research projects in Education Department of Shaanxi Provincial Government (grant number 20JK0829).This work was supported by the Independent Innovation Research Project of China University of Petroleum (East China) Funding (grant number 27RA2102011), the Qingdao Postdoc. Application Funding (grant number 05TB2102004), the Natural Science Basic Research Plan in Shaanxi Province of China (grant number 2020JQ-787), and the Scientific research projects in Education Department of Shaanxi Provincial Government (grant number 20JK0829). The authors would like to thank Yan'an Zhongshida Oil and Gas Engineering Technology Service Co. Ltd. for the scale-up production and the participation in the field trial. This paper only reflects the views of the authors and does not necessarily reflect the views of the company.
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Database: Compendex
Data Provider: Engineering Village
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77. Microstructure of directionally solidified Al2O3/EAG eutectic ceramics prepared with high-temperature gradient

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Authors: Zhong, Y.J. (1, 2); Liu, Y.R. (1); Gao, Q. (1); Wang, S.J. (1); Wang, X. (3)
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Corresponding author: Wang, X.(xwang@alum.imr.ac.cn)
Source title: Ceramics International
Abbreviated source title: Ceram Int
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Issue date: February 15, 2021
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Language: English
ISSN: 02728842
CODEN: CINNDH
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Directionally solidified Al2O3/Er3Al5O12 (EAG) eutectic ceramics are characterized by high melting point, improved high-temperature flexural strength, and high fracture toughness. Therefore, they have recently attracted considerable attention as candidates for high-temperature (>1500 °C) structural materials. In this work, directionally solidified Al2O3/EAG eutectic ceramics were prepared by the optical floating zone technique. 2D and 3D microstructures were observed by scanning electron microscopy and X-ray computerized tomography. The effect of thermal gradient and the solidification rate on Al2O3/EAG eutectic microstructure was investigated. The microstructure was completely irregular, exhibiting 3D interconnected microstructure. The size of eutectic microstructure decreased with increasing growth rate. Stable coupled-growth can be obtained when the solidification rate is less than 60 mm/h. Fracture toughness of Al2O3/EAG eutectic ceramics prepared with a withdrawal rate of 40 mm/h, measured by indentation tests, was KIC = 5.7 ± 0.3 MPa m1/2 and the hardness was HV = 14.5 ± 0.4 GPa. Interfaces between Al2O3 and the EAG phases play important role in improving fracture toughness. The characterization of microstructure and mechanical properties of Al2O3/EAG eutectic ceramics may provide guidance for microstructure design and reveal the deformation mechanisms of Al2O3/EAG eutectic ceramics. © 2020 Elsevier Ltd and Techna Group S.r.l.
Number of references: 35
Main heading: Solidification
Controlled terms: Fracture toughness - Scanning electron microscopy - Microstructure - Computerized tomography - Aluminum oxide - Growth rate - Thermal gradients - Alumina - Eutectics

Uncontrolled terms: Deformation mechanism - Directionally solidified - Eutectic microstructure - High temperature gradient - Microstructure and mechanical properties - Microstructure design - Optical floating zones - X ray computerized tomography
Classification code: 531.2 Metallography - 641.1 Thermodynamics - 723.5 Computer Applications - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 951 Materials Science
DOI: 10.1016/j.ceramint.2020.10.127
Funding Details: Number: 2017B030314010, Acronym: -, Sponsor: Guangdong Provincial Key Laboratory of Advanced Energy Storage Materials; Number: -, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province; Number: 6140923040203, Acronym: -, Sponsor: Foundation of Equipment Pre-research Area; Number: 51804252,51701156, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by the National Natural Science Foundation of China (grant numbers 51701156 , 51804252), Equipment Pre-Research Foundation of China (grant number 6140923040203), Natural Science Basic Research Program of Shaanxi (Program No.2020JQ-770), and the Open Fund of Guangdong Provincial Key Laboratory of Advance Energy Storage Materials (No. 2017B030314010).
Compendex references: YES
Database: Compendex
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78. S-wave field extraction of multi-wave seismic data based on S-transform spectral similarity of common conversion point gathers

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Title of translation: S
Authors: Huang, Dezhi (1); Han, Liguo (1); Yang, Feilong (2); Li, Huifeng (2); Yuan, Qiang (3); Sun, Nan (4); Yang, Wenping (3)
Author affiliation: (1) College of Exploration Technology, Jilin University, Changchun; 130026, China; (2) College of the Geoscience and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) North China Branch of Sinopec Geophysical Corporation, Zhengzhou; 450000, China; (4) Oil and Gas Exploration and Development Research Institute of Northeast Oil and Gas, Changchun; 130062, China
Corresponding author: Han, Liguo(hanliguo@jlu.edu.cn)
Source title: Acta Geophysica Sinica
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Issue: 4
Issue date: April 10, 2021
Publication year: 2021
Pages: 1351-1363
Language: Chinese
ISSN: 00015733
Document type: Journal article (JA)
Publisher: Science Press
Abstract: The S-transform (ST) spectrum of S-wave in each common conversion point (CCP) gathers after normal moveout (NMO) correction by S-wave velocity is similar to the stack trace's at the same time. Therefore, the S-wave fields can be extracted from multi-wave seismic data by an adaptive filter which is designed based on the similarity relationship. First of all, in order to remove the P-wave field in the data, the P-wave velocity NMO correction is applied to common middle point (CMP) gather data and the stack trace is subtracted from each trace. Secondly, the S transform of NMO CCP gather is calculated after adjusting the amplitude level of each trace to the level of stack trace, and the residual P-wave field and noise are removed by filtering the ST spectrum of seismic trace with ST spectrum of stack trace as reference adaptively. Finally, the amplitude level of filtering result is recovered to the amplitude level before filtering. Theoretical and practical data tests show that the proposed method can effectively extract the S-wave field in multi-wave seismic data, which provides a new idea for multi-wave and multi-component S-wave data processing. © 2021, Science Press. All right reserved.
Number of references: 26
Main heading: Adaptive filters
Controlled terms: Acoustic wave velocity - Adaptive filtering - Seismic response - Seismic waves - Shear waves - Data mining - Wave propagation - Data handling - Geophysical prospecting
Uncontrolled terms: Common-conversion points - Middle points - Multicomponents - Normal moveout (NMO) - P-wave velocity - S-wave velocity - Seismic traces - Spectral similarity

Classification code: 481.4 Geophysical Prospecting - 484 Seismology - 484.2 Secondary Earthquake Effects - 723.2 Data Processing and Image Processing - 751.1 Acoustic Waves - 931.1 Mechanics
DOI: 10.6038/cjg2021O0212
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

79. Causal Disentanglement: A Generalized Bearing Fault Diagnostic Framework in Continuous Degradation Mode (*Open Access*)

Accession number: 20220211436194
Authors: Li, Jie (1); Wang, Yu (2); Zi, Yanyang (1); Zhang, Haijun (3); Wan, Zhiguo (4)
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Source title: IEEE Transactions on Neural Networks and Learning Systems
Abbreviated source title: IEEE Trans. Neural Networks Learn. Sys.
Issue date: 2021
Publication year: 2021
Language: English
ISSN: 2162237X
E-ISSN: 21622388
Document type: Article in Press
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In recent years, the identification of out-of-distribution faults has become a hot topic in the field of intelligent diagnosis. Existing researches usually adopt domain adaptation methods to complete the generalization of diagnostic knowledge with the aid of target domain data, but the acquisition of fault samples in real industries is extremely time-consuming and costly. Moreover, most researches focus on samples with fixed fault levels, ignoring the fact that system degradation is a continuous process. In response to the above intractable problems, this article proposed a causal disentanglement network (CDN) to realize cross-machine knowledge generalization and continuous degradation mode diagnosis. In CDN, multitask instance normalization and batch normalization structure was proposed to learn task-specific knowledge and enhance the informativeness of the extracted features. On this basis, a causal disentanglement loss was proposed, which minimized the mutual information of features between subtask structures and captured the causal invariant fault information for better generalization. The experimental results proved the superiority and generalization ability of CDN, and the visualization results proved the performance of CDN in causality mining. IEEE
Main heading: Deep learning
Controlled terms: Fault detection - Failure analysis - Job analysis - Roller bearings
Uncontrolled terms: Causal learning - Continuous degradations - Deep learning - Faults diagnosis - Features extraction - Generalisation - Rolling bearing. - Rolling bearings - Task analysis
Classification code: 461.4 Ergonomics and Human Factors Engineering - 601.2 Machine Components
DOI: 10.1109/TNNLS.2021.3135036
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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80. Experimental investigation on imbibition characteristics of shale with highly developed bedding fractures

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Authors: Liu, Dunqing (1, 2, 3); Ge, Hongkui (2, 3); Shen, Yinghao (2, 3); Liu, Hongxian (1); Zhang, Yanjun (2, 3, 4)
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Corresponding author: Ge, Hongkui(gehongkui@163.com)
Source title: Journal of Natural Gas Science and Engineering

Abbreviated source title: J. Nat. Gas Sci. Eng.
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Publication year: 2021
Article number: 104244
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Imbibition is a vital factor leading to the low water recovery rate (WRR) in shale, and it is also the critical mechanism causing formation damage. However, many shale gas wells in Fuling can reach well gas yields under ultra-low WRR, and the corresponding mechanism is currently unclear. In this paper, multiple types of imbibition experiments were conducted on shale samples from typical low WRR but high yield wells in Fuling. Combined with pore structure and nuclear magnetic resonance (NMR) analyses, the forming mechanisms of low WRR and unaffected gas yields in Fuling were detailly analyzed and discussed. The results indicate that highly developed bedding fractures in Fuling play the key roles. Bedding fractures are directionally arranged and are of much wider aperture than randomly distributed microfractures in Fuling. Consequently, the permeability along the bedding direction is two orders of magnitude larger than that in the vertical direction, and the contact area between the fracturing fluid and the reservoir matrix also increased significantly. Both factors increased the imbibition rate and leading more water imbibed into the samples. However, due to the much wider aperture, less tortuosity and more complex fracture surface morphology, water imbibed in bedding fractures are much easier to be drained, and the flow channels for gas are effectively retained. Besides bedding fractures, mineral constituents, formation pressure also plays important roles. Thus, the ultra-low WRR but well gas yield wells in Fuling get its uniqueness, and it may not necessarily occur in other shales even with highly developed bedding fractures. Overall, this work helps understand the mechanism of the ultra-low WRR but high gas yield phenomenon in gas shale, which is significant for the post fracturing flowback optimization. © 2021 Elsevier B.V.
Number of references: 41
Main heading: Nuclear magnetic resonance
Controlled terms: Natural gas wells - Morphology - Gases - Pore structure - Shale gas - Fracturing fluids - Fracture - Surface morphology
Uncontrolled terms: Bedding - Experimental investigations - Formation damage - Gas well - Gas yields - Higher yield - Imbibition - Low water - Pores structure - Water recovery rates
Classification code: 512.2 Natural Gas Deposits - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.jngse.2021.104244
Funding Details: Number: ZLZX 2020-01-08, Acronym: CUP, Sponsor: China University of Petroleum, Beijing; Number: -, Acronym: КННК, Sponsor: China National Petroleum Corporation; Number: 2017ZX05039-004, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
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Compendex references: YES
Database: Compendex
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81. Characteristics of asphaltene precipitation and formation damage of tight light oil reservoirs under different CO2 injection modes

Accession number: 20220211451013
Title of translation: CO2
Authors: Huang, Xing (1, 2); Li, Xiang (1, 3); He, Mengqing (1); He, Xiaoming (4); Li, Tiantai (1, 2); Zhang, Rongjun (1, 5)
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Abbreviated source title: Shiyou Xuebao
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Issue: 12
Issue date: December 2021
Publication year: 2021
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Language: Chinese
ISSN: 02532697
CODEN: SYHPD9
Document type: Journal article (JA)
Publisher: Science Press
Abstract: CO2 injection in tight light oil reservoir may lead to serious asphaltene precipitation. To clarify the characteristics of asphaltene precipitation under different CO2 injection modes and the mechanism of formation damage, the reservoir of light crude oil of Member 7 of Yanchang Formation in Ordos Basin is studied in this study. Based on defining the impact of CO2 injection volume and pressure on the amount of asphaltene precipitation, through performing CO2 huff-puff and flooding experiments under different injection pressures, and with the assistance of online NMR scanning technique, this paper investigates the characteristics of asphaltene precipitation in the core under different gas injection modes, quantitatively evaluates the damage degree of asphaltene precipitation to physical reservoir properties, wettability and pore structure under different gas injection modes, and analyzes the damage mechanism of adphaltene precipitation to formation on the micro-pore scale. The results show that a great amount of asphaltene is deposited at the inlet end of core, and the closer to the outlet end of core, the smaller the amount of asphaltene precipitation, and the amount and scale of asphaltene precipitation under flooding mode is larger than those of huff and puff. The difference in porosity change rate is slight under two injection modes, but the permeability damage rate under the flooding mode is much higher than that of huff and puff. Asphaltene precipitation leads to the reversal from wettability to lipophilicity in rock; the wettability reversal index goes up as the injection pressure increases, and that under under the flooding mode is greater than that under the huff and puff mode. Asphalene is mainly deposited in large pores on the micro scale, but the plugging rate of large pores (0.092 μm#T22 © 2021, Editorial Office of ACTA PETROLEI SINICA. All right reserved.
Number of references: 35
Main heading: Carbon dioxide
Controlled terms: Pore structure - Precipitation (chemical) - Petroleum reservoir engineering - Wetting - Petroleum reservoirs - Asphaltenes - Floods - Reservoirs (water) - Oil well flooding
Uncontrolled terms: Asphaltene precipitation - Co 2 injections - CO2 flooding - CO2 huff and puff - Floodings - Injection mode - Injection pressures - Light crude - Oil reservoirs - Tight oil reservoir
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 513 Petroleum Refining - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Size 4.50E-06m, Size 9.00E-09m, Size 9.20E-08m
DOI: 10.7623/syxb202112011
Compendex references: YES
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82. Exposure Risk Assessment to Organic Compounds Based on Their Concentrations in Return Water from Shale Gas Developments

Accession number: 20220002559
Authors: Ma, Lanting (1, 3); Hurtado, Antonio (2); Eguilior, Sonsoles (2); Llamas Borrajo, Juan F. (1)
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Corresponding author: Eguilior, Sonsoles(sonsoles.eguilior@ciemat.es)
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Document type: Preprint (PP)

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Abstract: As a result of shale gas operations, significant amounts of return water from hydraulic fracturing are stored in tanks and/or ponds on the surface. These waters contain varying concentrations of toxic organic compounds; hence, there is a concern about leakage, which would cause adverse environmental effects and pose a risk to human health. The first part of this study focused on estimating the concentrations of organic compounds in the water–soil–atmosphere system of the Marcellus shale formation. Then, the chronic carcinogenic and non-carcinogenic risks from exposure to these pollutants via inhalation, ingestion, and dermal contact were assessed for an affected area. Regarding the inhalation of volatile organic compounds (VOCs), both carcinogenic and non-carcinogenic risks increased rapidly and exceeded the acceptable thresholds by several orders of magnitude in all scenarios, irrespective of the different recharge rates considered. Although the initial naphthalene (NAPH) concentration in the atmosphere was negligible, the risk level exceeded the threshold after 1,000–10,000 days. Negligible risks were associated with inhaling acetophenone and polycyclic aromatic hydrocarbons (PAHs, excluding NAPH), which diffuse very slowly into the atmosphere due to their Henry's constant (KH) values. Regarding exposure to contaminated surface soil, the results of Monte Carlo simulations showed that the upper percentiles of the estimated exposure to soil particles were below the thresholds for carcinogenic and non-carcinogenic risks. Because leakage of return water occurred underground, the direct contamination of surface soil via wastewater was less likely, and soil particles were generally widely dispersed in air before inhaling. Moreover, the sensitivity analysis indicated that the variable contributing the most to the determined risk levels was the pollutant concentration, followed by the exposure time. Therefore, using appropriate technology to reduce pollutant concentrations in storage ponds is the best strategy to minimise the associated risk to human health. © 2021, The Authors. All rights reserved.
Number of references: 35
Main heading: Risk assessment
Controlled terms: Health risks - Intelligent systems - Ketones - Lakes - Monte Carlo methods - Naphthalene - Polycyclic aromatic hydrocarbons - Risk perception - Sensitivity analysis - Soils - Volatile organic compounds - Water pollution
Uncontrolled terms: Carcinogenic risk - Carcinogenics - Flowback - Flowback water - Return water - Risk levels - Risk to human health - Risks assessments - Soil particles - Surface soil
Classification code: 453 Water Pollution - 461.7 Health Care - 483.1 Soils and Soil Mechanics - 723.4 Artificial Intelligence - 804.1 Organic Compounds - 914.1 Accidents and Accident Prevention - 921 Mathematics - 922.2 Mathematical Statistics
Numerical data indexing: Age 0.00E00yr to 2.74E+01yr
Compendex references: YES
Preprint ID: 3972633
Preprint source website: https://papers.ssrn.com/sol3/papers.cfm
Preprint ID type: SSRN
Database: Compendex
Data Provider: Engineering Village
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83. Wavelet neural network modeling for the retention efficiency of sub-15 nm nanoparticles in ultraltration under small particle to pore diameter ratio

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Authors: Fan, Zheng (1, 2); Ji, Pan-pan (1); Zhang, Jie (2); Segets, Doris (3); Chen, Da-Ren (2); Chen, Sheng-Chieh (2)
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Publisher: Elsevier B.V.
Abstract: Ultraltration (UF) using membranes with a small ratio of particle to pore diameter (PPD) would be very desirable for energy saving. The nanoparticle (NP) retention efficiency of membranes with a small PPD ratio depends on various physical and chemical properties of NPs, membranes and solutions as well as the filtration conditions. Until now, no simple model is available for the calculation of NP retention efficiency in UF membranes, besides, it is unlikely to conduct experiments covering all conditions for obtaining the efficiency. The artificial neural network (ANN) has been attracting much attention for studying the performance of a highly nonlinear system. In this study, a wavelet ANN model was developed to predict the NP retentions in membranes for the dead-ended UFs under different conditions. A total of 13 parameters, including the membrane features, particle properties, water solution characteristics, operating conditions, etc., are considered as ANN inputs and the NP retention efficiency as the output. A total of 200 datasets with high quality from literature were selected, in which 50% were for the model training, 30% for the model validation and the remaining 20% for the model testing. A high correlation between the output and inputs was obtained and the significance of the 13 parameters on the NP retention was ranked. A case study was performed to further validate the trained ANN model in the prediction of the retention efficiency of 10 nm gold NPs in a 50 nm pore sized polycarbonate track etched (PCTE) membrane at different pH conditions (5–9). Focusing on the variation of pH, an excellent agreement between the model prediction and the calculation by the modified extended Derjaguin Landau Verwey Overbeek-Maxwell (MEDLVO-Maxwell) model originating from classical and extended DLVO theory was obtained. The interaction energy in the MEDLVO-Maxwell model was based on the separation distance calculated by a quench molecular dynamics (MD) simulation. This study illustrates and validates the application of ANN modeling on the NP retention efficiency prediction in the UF with small PPD ratios. © 2021 Elsevier B.V.
Number of references: 80
Main heading: Nanoparticles
Controlled terms: Membranes - Neural networks - Forecasting - Molecular dynamics - Energy conservation - Microfiltration
Uncontrolled terms: Artificial neural network models - Condition - Diameter ratio - Modified extended DLVO model - Particle to pore diameter ratio - Pore diameters - Quench molecular dynamic simulation - Retention efficiencies - Small particles - Wavelet artificial neuron network
Classification code: 525.2 Energy Conservation - 761 Nanotechnology - 801.4 Physical Chemistry - 802.3 Chemical Operations - 933 Solid State Physics - 951 Materials Science
Numerical data indexing: Percentage 2.00E+01%, Percentage 3.00E+01%, Percentage 5.00E+01%, Size -1.50E-08m, Size 1.00E-08m, Size 5.00E-08m
DOI: 10.1016/j.memsci.2021.119503
Funding Details: Number: -, Acronym: NIOSH, Sponsor: National Institute for Occupational Safety and Health; Number: -, Acronym: -, Sponsor: Ford Motor Company; Number: -, Acronym: -, Sponsor: BASF; Number: -, Acronym: UF, Sponsor: University of Florida; Number: -, Acronym: -, Sponsor: Cummins Incorporated; Number: 201908610135, Acronym: CSC, Sponsor: China Scholarship Council;
Funding text: Although ANN modeling has been widely applied in the UF and NF, when there is a shortage for required inputs, the traditional ANN can lead to the unstable initialization of the networks and uncertain variation of the stopping criterion during the optimization of model parameters. Therefore, the traditional ANN can only be applied in the cases requiring only a few numbers of independent variables as the inputs in the modeling, which were easy to be monitored and inexpensive to be measured, e.g., transmembrane pressure, flux, pH, UV254, total dissolved solids, turbidity, etc. To solve the above issue, the support vector machine (SVM) is a supervised learning algorithm that was applied to improve the performance of ANN modeling [24]. Adib et al. [22] adopted the SVM in the ANN to study the correlation of permeation flux decline and fouling resistance in the oily wastewater treatment. Transmembrane pressure, operating temperature, crossflow velocity, and pH were chosen as model inputs. The testing values calculated by the models were in good agreement with trail data. For the improvement of the ANN architecture, Saha et al. [23] used a two-layered feed-forward (known as the Levenberg-Marquardt algorithm) method to compare the theoretical flux decline with the actual detection result during the UF procedure. Good regression values throughout the UF process time for all test cases were obtained. For the extremely complicated ANN modeling of UF, a new class of networks that applies the wavelet analysis was employed [25–27]. It has been successfully applied in the daily river flow forecasting [25], water quality prediction [26], islanding detection [27] and so on. Besides, the wavelet ANN was found to be very effective for modeling other universal problems when other ANNs had failed [28–31]. The success of the wavelet ANN was attributed to its good adaptability, strong robustness in self-learning and possessing advantages in features of time-frequency localization and fault tolerance. Thus, the wavelet ANN should be applicable for the case of low PPD ratio UF of this study.The authors thank the support of members of the Center for Filtration Research: 3 M Corporation, Applied Materials Inc. BASF Corporation, Boeing Company, Corning Inc. China Yancheng Environmental Protection Science and Technology City, Cummins Filtration Inc. Donaldson Company, Inc., Entegris, Inc. Ford Motor Company, W. L. Gore & Associates Inc. Guangxi Wat Yuan Filtration System Co. Ltd, MSP Corporation; Samsung Electronics Co. Ltd., Shigematsu Works Co. Ltd.; TSI Inc.; W. L. Gore & Associates, Inc., Xinxiang Shengda Filtration

Technique Co. Ltd., and the affiliate member National Institute for Occupational Safety and Health (NIOSH). Z.F. and P.P.J. acknowledge the funding from China Scholarship Council (CSC, award number: 201908610135).The authors thank the support of members of the Center for Filtration Research: 3 M Corporation , Applied Materials Inc., BASF Corporation , Boeing Company , Corning Inc., China Yancheng Environmental Protection Science and Technology City, Cummins Filtration Inc., Donaldson Company, Inc. , Entegris, Inc., Ford Motor Company , W. L. Gore & Associates Inc., Guangxi Wat Yuan Filtration System Co., Ltd , MSP Corporation; Samsung Electronics Co., Ltd. , Shigematsu Works Co. Ltd. ; TSI Inc.; W. L. Gore & Associates, Inc. , Xinxiang Shengda Filtration Technique Co. Ltd. , and the affiliate member National Institute for Occupational Safety and Health (NIOSH) . Z.F. and P.P.J. acknowledge the funding from China Scholarship Council (CSC , award number: 201908610135).
Compendex references: YES
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Data Provider: Engineering Village
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84. Influence of boss-backing welding to ERW pipe (*Open Access*)

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Authors: Luo, Jinheng (1); Zhao, Xinwei (1); Liu, Ming (2); Luo, Sheji (3); Hu, Meijuan (1); Wu, Gang (1); Li, Lifeng (1); Zhu, Lixia (1)
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Source title: Materials Research Express
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Publication year: 2021
Article number: 056517
Language: English
E-ISSN: 20531591
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: Station and valve chamber design often encounter the situation of drilling hole at the main pipeline and welding boss-backing to connect the branch pipe. Boss hole location should generally be at least 100 mm away from the longitudinal weld or spiral weld. However, because the electric resistance weld (ERW) is difficult to distinguish in practice, some bosses mounting position coincide with ERW or close to. In this paper, the influence of boss-backing welding directly on the longitudinal weld to the original residual stresses of ERW pipe was studied. The microstructure of pipe body and longitudinal weld after welding was also analysis. The testing results showed that the overall residual stresses of ERW pipe were relatively small. Residual stress at the longitudinal weld region were smaller than those at the pipe body region. After the boss-backing welding, the axial residual stress at the longitudinal weld and the circumferential residual stress at the pipe body region near the intersection increased sharply to 2.5 (444 MPa) and 3.8 (433 MPa) times, respectively. The invaded width and depth to the ERW pipe after welding were about 15.167 mm and 3.376 mm. Granular bainite with necklace type M-A constituents could be observed at the invaded zone. It is suggested that small welding heat input should be adopted for boss-backing welding. © 2021 The Author(s). Published by IOP Publishing Ltd.
Number of references: 25
Main heading: Welds
Controlled terms: Residual stresses - Microstructure
Uncontrolled terms: Branch pipes - Drilling holes - Granular bainites - Longitudinal welds - M-a constituents - Pipe body - Valve chambers - Welding heat input
Classification code: 538.2 Welding - 951 Materials Science
Numerical data indexing: Pressure 4.33e+08Pa, Pressure 4.44e+08Pa, Size 1.00e-01m, Size 1.52e-02m, Size 3.38e-03m
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Compendex references: YES
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85. Preparation and the Foaming Activity Study of Hydroxymethyl Cetyltrimethyl Ammonium Chloride

Accession number: 20211210122987
Title of translation: Herstellung von Hydroxymethylcetyltrimethylammoniumchlorid und Untersuchung seines Schaumvermögens
Authors: Liu, Qiaona (1); Bai, Yun (1); Dong, Sanbao (1, 2); Li, Jinling (1); Song, Zhifei (3); Chen, Shijun (1); Zhang, Jie (1); Chen, Gang (1)
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Volume: 58
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Publication year: 2021
Pages: 153-160
Language: English
ISSN: 09323414
CODEN: TSDEES
Document type: Journal article (JA)
Publisher: Walter de Gruyter GmbH
Abstract: In this paper, hydroxymethyl cetyltrimethyl ammonium chloride (HM-CTAC) was prepared from cetyltrimethyl ammonium chloride (CTAC) and formaldehyde with different molar ratios (1:1 to 1: 4). The effects of reaction conditions (molar ratio) on surface properties were studied, including surface tension, foaming ability, high temperature resistance, methanol resistance and salt resistance. The results show that the minimum surface tension of HM-CTAC is lower than that of CTAC, and HM-CTAC (1:1) has the lowest surface tension of 31.89 mN · m-1. The foam volume of HM-CTAC with different molar ratios is higher than that of CTAC, and HM-CTAC (1:4) has a high foam volume of 435 mL. Compared to CTAC, the HM-CTAC under different reaction conditions has higher temperature resistance. At the methanol content of 10 wt.%, the initial foam volume of HM-CTAC is higher than that of CTAC, and the initial foam volume of HM-CTAC (1:2) is the highest with a volume of 21.5 mL. Among all the surfactants prepared under different reaction conditions, HM-CTAC (1:3) has the highest salt resistance with a relatively stable change in foam volume under different salt contents. © 2021 Walter de Gruyter GmbH, Berlin/Boston.
Number of references: 28
Main heading: Surface tension
Controlled terms: Methanol - Molar ratio - Chlorine compounds - Temperature control
Uncontrolled terms: Cetyltrimethylammonium chloride - Foaming ability - High temperature resistance - Methanol content - Minimum surfaces - Reaction conditions - Salt resistance - Temperature resistances
Classification code: 731.3 Specific Variables Control - 801.4 Physical Chemistry - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Surface_Tension 3.19e-02N*m, Volume 2.15e-05m3, Volume 4.35e-04m3
DOI: 10.1515/tsd-2019-2221
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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86. Significance and purpose of the comprehensive evaluation of hydrocarbon traps (*Open Access*)

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Authors: Wang, Wei (1, 2); Chen, Guomin (2, 3); Wang, Lin (2); Wang, Shenjian (2); Wu, Qilin (2)
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Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 658
Part number: 1 of 1
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Issue title: 3rd International Forum on Geoscience and Geodesy
Issue date: February 19, 2021
Publication year: 2021
Article number: 012014
Language: English
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Document type: Conference article (CA)
Conference name: 2020 3rd International Forum on Geoscience and Geodesy, IFGG 2020
Conference date: November 13, 2020 - November 15, 2020
Conference location: Shenyang, China
Conference code: 167254
Publisher: IOP Publishing Ltd
Abstract: A comprehensive evaluation of hydrocarbon traps is the premise of the well-drilling designs' decision-making optimization. The comprehensive queue optimization usually includes evaluations on the trap reliability, oil-bearing, and trap economy. It is crucial to work out the comprehensive queuing coefficient with one-dimensional based on a specific model that reflects the exploration stage and researchers' understanding of the multiple evaluation contents whose characteristics are the structure of systematization and hierarchy. A highly systematic and complex system engineering belonging to the evaluation and decision-making theories can emerge from the involvement disciplines. It is necessary to construct an integrated, iterative, and quantitative evaluation to improve the evaluation results' scientific rationality. It needs to integrate and combine related ideas from the multi-discipline, such as evaluation theory, decision theory, and computational science and mathematical statistics. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Computation theory
Controlled terms: Behavioral research - Decision making - Hydrocarbons - Statistics - Decision theory - Oil bearing formations - Oil well drilling
Uncontrolled terms: Comprehensive evaluation - Computational science - Decision-making optimization - Decision-making theories - Evaluation results - Multi disciplines - Quantitative evaluation - Scientific rationalities
Classification code: 461.4 Ergonomics and Human Factors Engineering - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 804.1 Organic Compounds - 912.2 Management - 922.2 Mathematical Statistics - 961 Systems Science - 971 Social Sciences
DOI: 10.1088/1755-1315/658/1/012014
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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87. A Fiber Bragg Grating acceleration sensor with temperature compensation

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Authors: Zhao, Xianfeng (1, 2, 3, 4); Jia, Zhen'an (1, 2, 3, 4); Fan, Wei (1, 2, 3, 4); Liu, Wangfei (1, 2, 3, 4); Gao, Hong (1, 2, 3, 4); Yang, Kaiqing (1, 2, 3, 4); Yu, Dakuan (1, 2, 3, 4)
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Article number: 166993
Language: English
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Document type: Journal article (JA)
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Abstract: A Fiber Bragg Grating(FBG) accelerometer based on a composite beam is proposed. Owing to the opposite movement of the two FBGs, the influence of temperature can be reduced and the sensitivity can be improved by the difference operation of FBGs' center wavelength shift. Through theoretical analysis and simulation of the proposed sensor, the sensor structure parameters are determined. The theory of the proposed sensor is verified by experiments, and the experimental results show that the temperature impact on the sensor structure is reduced to 0.47 pm/ in the range of 25–75 . The accelerometer has a good response flat region at 40–140 Hz and the sensitivity is 234.5 pm/ g. The orthogonal crosstalk of the accelerometer is -21.01 dB. The proposed FBG acceleration sensor has a good application prospect in low-frequency oil and gas seismic exploration. © 2021 Elsevier GmbH
Number of references: 21
Main heading: Fiber Bragg gratings
Controlled terms: Petroleum prospecting - Accelerometers
Uncontrolled terms: A.Fibres - Acceleration sensors - Center-wavelength - Composite beam - Fiber Bragg - Fiber bragg grating - Fiber bragg grating accelerometer - Sensor - Sensor structures - Temperature compensation
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 943.1 Mechanical Instruments
Numerical data indexing: Decibel 2.101E+01dB, Frequency 1.40E+02Hz, Size 2.345E-10m, Size 4.70E-13m
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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88. Introduction of low strain energy GdAlO3 grain boundaries into directionally solidified Al2O3/GdAlO3 eutectics

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Authors: Wang, Xu (1); Zhang, Wen (1); Zhong, Yujie (2); Sun, Luchao (3); Hu, Qiaodan (4); Wang, Jingyang (3)
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Volume: 221
Issue date: December 2021
Publication year: 2021
Article number: 117355
Language: English
ISSN: 13596454
Document type: Journal article (JA)
Publisher: Acta Materialia Inc
Abstract: In order to tune the mechanical properties of the Al2O3/GdAlO3 (GAP) eutectic ceramics, low energy GAP grain boundaries (GBs) were introduced into Al2O3/GAP eutectic ceramics. We prepared single-crystal Al2O3/bi-crystal GAP eutectic ceramics with the directional solidification technique, in which the Al2O3 was single-crystal, but the GAP was bi-crystal. The crystallographic orientation relationships between Al2O3 and GAP was determined as [101¯0] Al2O3 || [001] GAP-I || [11¯0]GAP-II, (112¯0) Al2O3 || (200) GAP-I, (112¯0)Al2O3 || (112) GAP-II, and (110) GAP-I || (110) GAP-II. Such GAP GB had ultra-low strain energy. The phase boundaries (PBs) strain energies are

higher than that of the GAP GB. However, the difference in the interfacial strain energy between the two PBs was quite small. The reason for the successful preparation of single-crystal Al2O3/bi-crystal GAP eutectic ceramics was attributed to almost the same driving force requirements for the two PBs during solidification. We envisaged that the concept of interfacial structure design could open new pathways for high-performance materials design. © 2021
Number of references: 42
Main heading: Grain boundaries
Controlled terms: Strain energy - Alumina - Aluminum oxide - Single crystals - Gadolinium compounds - Solidification - Eutectics
Uncontrolled terms: Bi-crystals - Energy defects - Energy grain - Eutectic ceramics - Grain-boundaries - Interface structures - Low energy defect - Low strain energy grain boundary - Low strains - Lower energies
Classification code: 531.2 Metallography - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 931.1 Mechanics - 933.1 Crystalline Solids
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Data Provider: Engineering Village
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89. Three-dimensional mesostructured binder-free nickel-based TiO2/RGO lithium-ion battery negative electrodes with enhanced volumetric capacity (*Open Access*)

Accession number: 20211910345241
Authors: Li, Zhao (1, 2); Xiao, Meixia (1); Liu, Yue-Feng (2, 3); Gao, Huan-Huan (1); Braun, Paul V. (2)
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Issue: 15
Issue date: August 1, 2021
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Language: English
ISSN: 02728842
CODEN: CINNDH
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Realization of high energy density Li-ion anodes is a significant challenge due to the volume changes generally exhibited by such systems during charge and discharge. Here, three-dimensional inverse opal (3D-IO) mesostructured Ni@TiO2@RGO electrodes were fabricated by templating nickel electrodeposition with self-assembled, three dimensionally ordered polystyrene (PS) opals, followed by atomic layer deposition (ALD) of TiO2 and spray coating of reduced graphene oxide (RGO). The electrode delivers initial discharge and charge volumetric capacities of 2082 mAh cm-3 and 1873 mAh cm-3 at 0.5 C, respectively. The composite electrode exhibits volumetric discharge and charge capacities of 1508 mAh cm-3 and 1504 mAh cm-3 at 0.5 C after 200 cycles and good rate capacity up to at least 10 C. The almost unbroken 3D-IO mesostructure after 200 lithiation and delithiation cycles demonstrates the excellent structural stability of the 3D-IO electrode design concept. The enhanced volumetric capacity and structural stability originate from high active materials loading, the short and efficient ion and electron pathways, and the composite structure provided by the nickel electrodeposition, ALD, and RGO spray coating electrode preparation process, as well as that both TiO2 and RGO participate in lithium storage. © 2021 Elsevier Ltd and Techna Group S.r.l.
Number of references: 46
Main heading: Lithium-ion batteries

Controlled terms: Graphene - Electrodes - Stability - Titanium dioxide - Electrodeposition - Electric discharges - Nickel coatings - Silicate minerals - Atomic layer deposition - Ions
Uncontrolled terms: Atomic-layer deposition - Ion batteries - Lithium ions - Mesostructured - Negative electrode - Nickel electrodeposition - Reduced graphene oxides - TiO-2 - Titania - Volumetric capacity
Classification code: 482.2 Minerals - 539.3.1 Electroplating - 701.1 Electricity: Basic Concepts and Phenomena - 761 Nanotechnology - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 813.1 Coating Techniques - 813.2 Coating Materials - 933.1.2 Crystal Growth
DOI: 10.1016/j.ceramint.2021.04.147
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Open Access type(s): All Open Access, Bronze
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90. Anisotropic elastic, thermal properties and electronic structures of M2AlB2 (M=Fe, Cr, and Mn) layer structure ceramics (*Open Access*)

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Authors: Liu, Y.Z. (1); Sun, L. (2); Zheng, B.C. (1); Yi, Y.L. (1); Zhai, W.Y. (2); Peng, J.H. (3); Li, W. (1)
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Abstract: The anisotropic elastic, thermal properties and electronic structures of ternary layered transition metal borides M2AlB2 (where M = Fe, Cr, and Mn) were analysed using first-principles calculations and the Debye quasi-harmonic approximation. There was a good agreement between our calculated lattice constants and previous experimental and theoretical results. Our calculated thermodynamic stability parameters demonstrated that these borides had stable structures. Mn2AlB2 was the most incompressible material, while Cr2AlB2 was more rigid and a transversely resistant deformed material. The anisotropy of elasticity of the compounds was also estimated. They had different anisotropic elastic properties. The chemical bonding of the compounds primarily involved mixed covalent-metallic interactions. Covalent bonds were present between the boron and metal atoms. The M-M and B-B bond lengths were the longest and shortest in these compounds, respectively, and the bond strength in Fe2AlB2 was stronger. The anisotropic linear thermal expansion coefficients of these materials were also calculated. The thermal expansion in the [001] direction was the largest relative to the other two directions. © 2020
Number of references: 44

Main heading: Electronic structure
Controlled terms: Aluminum compounds - Borides - Structural properties - Calculations - Chromium compounds - Iron compounds - Anisotropy - Lattice constants - Thermal expansion - Transition metals - Chemical bonds
Uncontrolled terms: Anisotropic elastic - Anisotropic elastic properties - Chemical bondings - First-principles calculation - Harmonic approximation - Incompressible material - Linear thermal expansion coefficients - Stable structures
Classification code: 408 Structural Design - 531 Metallurgy and Metallography - 641.1 Thermodynamics - 801.4 Physical Chemistry - 804.2 Inorganic Compounds - 812.1 Ceramics - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 933.1.1 Crystal Lattice - 951 Materials Science
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Open Access type(s): All Open Access, Bronze
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91. Effect of adsorption phase and matrix deformation on methane adsorption isotherm of Fuling shale

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Abstract: The controlling factors and mechanisms of gas adsorption are useful in gas content evaluation and production forecast for shale gas. To determine the adsorption characteristics of the Fuling shale at high pressures, and investigate the root cause of isotherms with abnormal shapes, a series of methane adsorption isotherms on the Fuling shale samples were measured utilizing gravimetric and volumetric methods at the temperature of 88 °C and several pressures up to 40 MPa. The measurement data was fitted by the original Langmuir equation and the Langmuir

equation involving the adsorbed phase. Then, the factors that influence the shape of the isotherm under high pressure were investigated, and three main factors including adsorption phase, shale matrix and matrix compression were later incorporated to construct further modified models for sample volume, void volume and adsorption amount. It is applied to investigate the difference in isotherms obtained by gravimetric and volumetric methods, and the difference in isotherms for clay minerals and organic matter. The results indicate that the range of methane adsorption capacities on Fuling shale is 1.6–4.1 × 10-3 m3/kg. The excess adsorption isotherms obtained by the gravimetric method can be fitted with good accuracy by the Langmuir-AP model accounting for the adsorbed phase, and the calculated absolute adsorption isotherms for shale samples are all classified to Type I. From the volumetric method and the gravimetric method respectively, the shape of excess adsorption isotherms are similar at low pressure, but different at high pressure. The effects of the adsorption phase and matrix swelling on adsorption amounts are less from the volumetric method than that from the gravimetric method. While the role of matrix compression played on the results is more sensitive from the volumetric method than that from the gravimetric method, especially under high pressure. The effect of matrix compression on adsorption for organic matter differs from that for clay minerals, as the deformation of organic matter under high pressure is larger than that of clay. © 2021
Number of references: 52
Main heading: Adsorption isotherms
Controlled terms: Methane - Clay minerals - Deformation - Gas adsorption - Gases - Shale gas - Biogeochemistry - High pressure effects
Uncontrolled terms: Adsorption matrixes - Adsorption phasis - Gravimetric methods - High pressure - Langmuir equation - Matrix compression - Methane adsorption - Methane adsorption isotherm - Organics - Volumetric methods
Classification code: 481.2 Geochemistry - 482.2 Minerals - 512.2 Natural Gas Deposits - 522 Gas Fuels - 801.2 Biochemistry - 802.3 Chemical Operations - 804.1 Organic Compounds
Numerical data indexing: Pressure 4.00E+07Pa, Size 3.00E+00m, Temperature 3.61E+02K
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92. Measurement of local material properties and failure analysis of resistance spot welds of advanced high-strength steel sheets (*Open Access*)

Accession number: 20210509855404
Authors: Ma, Yunwu (1); Takikawa, Akira (2); Nakanishi, Jun (2); Doira, Kazuyoshi (2); Shimizu, Tetsuo (3); Lu, Yongxin (4); Ma, Ninshu (1)
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Publisher: Elsevier Ltd
Abstract: Safety evaluation of resistance spot welds necessitates the accurate measurement of local constitutive properties. This study employed miniature mechanical tests to investigate the deformation and failure behaviors of nugget, heat affected zone (HAZ), and corona bond of resistance spot welded JSC980YL steel. A novel mini-peel test was developed to enable local fracture in HAZ for numerical inverse calibration of constitutive parameters. The fracture constants of weld zones calibrated using Cockcroft-Latham ductile failure criterion were incorporated in finite element models to predict the failure modes of spot welds in tensile-shear and cross-tension coupon tests. The result indicates that the ultimate tensile strengths of the nugget and the corona bond were 37.6% higher and 5.8% lower, respectively, than that of the base material. The nugget and HAZ exhibited ductile fracture, whereas the corona bond was brittle fracture with only 1.2% elongation. In the coupon tests, the increase of nugget diameter slowed down the damage accumulation rate in the nugget and accelerated that in the HAZ, resulting in the transition of failure mode from interfacial to pullout. The failure load of corona bond in coupon tests increased with the increase of nugget diameter while its contribution to the peak load decreased. © 2021 The Authors
Number of references: 50
Main heading: Spot welding
Controlled terms: Heat resistance - Failure modes - Heat affected zone - Tensile strength - Tensile testing - Ductile fracture - High strength steel
Uncontrolled terms: Accurate measurement - Constitutive parameters - Constitutive properties - Damage accumulation - Deformation and failures - Local material properties - Resistance spot weld - Ultimate tensile strength
Classification code: 538.2 Welding - 538.2.1 Welding Processes - 545.3 Steel
Numerical data indexing: Percentage 1.20e+00%, Percentage 3.76e+01%, Percentage 5.80e+00%
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93. Casing Collapse Strength Analysis under Nonuniform Loading Using Experimental and Numerical Approach (*Open Access*)

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Authors: Li, Dongfeng (1, 2); Yu, Fu (3); Fan, Heng (4); Wang, Rui (2); Yang, Shangyu (2); Yan, Xiangzhen (1)
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Abstract: Multistage fracturing is the main means of shale gas development, and casing deformation frequently occurs during fracturing of shale gas horizontal wells. Fracturing fluid entering the formation will change in situ stress nearby the wellbore. The changes of in situ stress are mainly reflected in the following two aspects: one is the increase of in situ stress and the other is the nonuniformity of in situ stress along the wellbore. And it is for this reason that the production casing is more likely to collapse under the nonuniform in situ stress load. According to the service conditions of production casing in shale gas reservoir, this paper studied the casing deformation and the collapsing strength subjected to the nonuniform loading by the experimental and numerical simulation method. The results show that under the condition of nonuniform loading, (1) the diameter variation rate of the casing reduces with the

increase in the ratio of sample to tooling length. When the ratio is less than 3, the casing collapse strength will be significantly reduced. And when the ratio is greater than 6, the impact of sample length on casing collapse strength can be ignored. (2) The increase in the applied loading angle will decrease the diameter variation rate. When the loading angle increases from 0° to 90°, the critical load value increases from 1600 kN to 4000 kN. (3) The increase in load unevenness coefficient will rapidly decrease the casing collapse strength. When the load unevenness coefficient n is 0.8, the casing collapse strength reduces to 60%, and when the load unevenness coefficient n is 0, the casing collapse strength reduces to 28%. The findings of this study can help for better understanding of casing damage mechanism in volume fracturing of shale gas horizontal well and guide the selection of multistage fracturing casing type and fracturing interval design. © 2021 Dongfeng Li et al.
Number of references: 23
Main heading: Horizontal wells
Controlled terms: Petroleum reservoirs - Fracturing fluids - Numerical methods - Shale gas - Stresses - Boreholes - Deformation - Gases - Oil field equipment - Loading
Uncontrolled terms: Casing deformation - Collapse strength - Diameter variation - Insitu stress - Loading angle - Multistage fracturing - Nonuniform loadings - Production casings - Strength analysis - Wellbore
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94. Preparation and oxidation kinetics behavior of bulk Cr3C2-20 wt % Ni cermets

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Authors: Zhai, Wenyan (1); Zhang, Kaihua (1); Gao, Yimin (2); Sun, Liang (1); Xu, Liujie (3); Wang, Yiran (2); Dong, Hui (1); Wang, Shiqing (1); Gao, Qian (1)
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In this study, bulk Cr3C2-20 wt % Ni cermets were successfully fabricated by high-energy milling and pressureless sintering in a vacuum furnace. Microstructures, elements distribution, and high temperature oxidation mechanism were researched by SEM, EPMA, and differential thermal analyzer (DTA), respectively. Oxidation kinetics regularity of bulk Cr3C2-20 wt % Ni cermets was investigated at 600–800 °C for the first time. Isothermal cyclic oxidation experiments were studied using the heat-treatment furnace for 100 h. The results indicated that the porosity decreased, while the hardness, bending strength, and fracture toughness increased with an improvement in the vacuum degree. Cr3C2-20 wt % Ni cermets displayed outstanding oxidation resistance and the dynamic oxidation curves followed the parabolic rate law. Besides, the oxidation rate constants increased three orders of magnitudes with an increase in the oxidation temperatures from 600 °C to 800 °C. The mechanism of the oxidation resistance was the generation of the protective and dense oxide layers on the sub-surface of the oxidation specimens, which hindered the diffusion of Cr3+, Ni2+, O2 and effectively protected the substrate from further oxidation. © 2020 Elsevier Ltd and Techna Group S.r.l.
Number of references: 34
Main heading: Sintering

Controlled terms: Cermets - Differential thermal analysis - Mechanical alloying - Rate constants - Bending strength - Thermooxidation - Vacuum furnaces - Oxidation resistance - Fracture toughness - Nickel
Uncontrolled terms: Differential thermal analyzers - Elements distribution - Heat treatment furnaces - High temperature oxidation mechanisms - Oxidation temperature - Parabolic rate law - Pressure-less sintering - Three orders of magnitude
Classification code: 531 Metallurgy and Metallography - 539.1 Metals Corrosion - 548.1 Nickel - 802.2 Chemical Reactions - 812.1 Ceramics
Numerical data indexing: Temperature 8.73e+02K to 1.07e+03K, Time 3.60e+05s
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95. Corrosion inhibitors and its application in CO2 corrosion

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Authors: Liu, Chang (1); Chen, Xu (1); Yang, Jiang (2, 3)
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Abstract: The CO2 corrosion mechanism was summarized and the influences of temperature, CO2 partial pressure, pH and medium composition on CO2 corrosion were analyzed. The corrosion inhibitors widely used to inhibit CO2 corrosion such as imidazoline derivatives, surfactants, quaternary ammonium salts and organic amines were reviewed. The application and mechanism of several common corrosion inhibitors in CO2 corrosion were described in detail. Most of the corrosion inhibitors acted on the active sites by physical adsorption and chemical adsorption, and the limitations of some corrosion inhibitors were pointed out. Usually the combined effect of two or more corrosion inhibitors was better than a single corrosion inhibitor, however, the role of a single component was difficult to measure. Imidazoline corrosion inhibitor was often used as one of the components of compound corrosion inhibitors in CO2 corrosive environment, and the synergistic effect of imidazoline and other corrosion inhibitors was analyzed. Finally, the future research directions of CO2 corrosion and CO2 corrosion inhibitors were prospected. © 2021, Chemical Industry Press Co., Ltd. All right reserved.
Number of references: 77
Main heading: Corrosion inhibitors
Controlled terms: Carbon dioxide - Salts - Amines
Uncontrolled terms: Carbon dioxide corrosion - CO 2 corrosion - Corrosion mechanisms - Imidazoline derivatives - Imidazolines - Influencing factor - ITS applications - Media composition - Pressure compositions - Synergistic effect
Classification code: 539.2.1 Protection Methods - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 804.2 Inorganic Compounds

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96. Hydraulic apertures of barren fractures in tight-gas sandstones at depth: Image-core calibration in the lower cretaceous Bashijiqike Formation, Tarim Basin

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Corresponding authors: Nian, Tao(taonian@xsyu.edu.cn); Tan, Chengqian(cqtan@xsyu.edu.cn)
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Article number: 108016
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Understanding the features of apertures of hydraulically conductive fractures occurring in the subsurface is vitally important in tight-gas reservoirs. The Cretaceous Bashijiqike Formation in the Kelasu Belt, Tarim Basin, is a gas enrichment reservoir at depths greater than 6,500 m. The matrix permeability is less than 0.1 mD, and generally decreases by one to two orders of magnitude under the reservoir conditions. Core analyses and image logs indicate that one type of natural fractures, which were assumed to have minor contributions to fluid flow in the subsurface, are pervasively developed with barren features and appear as conjugate fracture patterns with en-echelon steps occurring on the fracture surfaces. The hydraulic apertures of these fractures were determined based on core-image calibration and overburden pressure testing on the fractured cores under reservoir conditions, and suggests that they have hydraulic apertures ranging between 2.54 μm and 5.62 μm. The hydraulic fracture apertures could gradually decrease in size with burial depth. The fractures are hydraulically open implied by the presence of asperities generated by certain amounts of shearing displacement along the fracture surface and the abnormally high formation pressure of the Bashijiqike Formation. The results also imply that all of the fractures are able to enhance the reservoir permeability in the tight-gas sandstones, but affected by present horizontal stress. © 2020 Elsevier B.V.
Number of references: 83
Main heading: Calibration
Controlled terms: Petroleum reservoirs - Petroleum reservoir engineering - Flow of fluids - Gases - Natural fractures - Hydraulic fracturing - Tight gas - Sandstone
Uncontrolled terms: Matrix permeability - Orders of magnitude - Overburden pressures - Reservoir conditions - Reservoir permeability - Shearing displacement - Tight gas reservoirs - Tight gas sandstones
Classification code: 421 Strength of Building Materials; Mechanical Properties - 482.2 Minerals - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 631.1 Fluid Flow, General
Numerical data indexing: Size 2.54e-06m to 5.62e-06m, Size 6.50e+03m
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97. Experiment on proppant migration and placement behavior in rough fractures

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Title of translation:
Authors: Jiang, Tingxue (1); Bian, Xiaobing (1); Hou, Lei (1); Huang, Hai (2); Zhang, Chao (3); Li, Huazhou (4); Wang, Zhiyuan (3)
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Corresponding author: Li, Huazhou(huazhou@ualberta.ca)
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Abbreviated source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)
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Language: Chinese
ISSN: 16735005
Document type: Journal article (JA)
Publisher: University of Petroleum, China
Abstract: A series of experiments were conducted to quantify the proppant filling ratio in rough fractures under different operating conditions using a self-designed rough-fracture experimental set-up. The effects of wall surface roughness, proppant mass fraction, fracturing fluid viscosity and fracture width on sand transport were investigated. Based on the experimental results, a new empirical model was proposed to predict the areal coverage of the proppants in rough fractures, and the roughness of the fracture walls was correlated into the model using the variation-function-based fractal dimension parameter. The experimental results show that, due to the rough nature of the fracture surfaces, the proppant transport behavior in rough fractures is very different from that in smooth fractures. In rough fractures, high fracturing-fluid viscosity and pumping rate are needed to ensure an effective migration of proppants, and the greater of the proppant mass fraction, the higher of fluid viscosity and pumping rate are required. The newly established model can effectively predict the areal coverage of proppant in rough fractures under different operating conditions. © 2021, Editorial Office of Journal of China University of Petroleum(Edition of Natural Science). All right reserved.
Number of references: 20
Main heading: Surface roughness
Controlled terms: Forecasting - Fracture - Fracturing fluids - Proppants - Viscosity - Fractal dimension
Uncontrolled terms: Areal coverage - Coverage prediction - Different operating conditions - Filling ratio - Mass-fraction - Operational parameters - Prediction modelling - Propant relative coverage prediction model - Pumping rate - Rough fractures
Classification code: 511.1 Oil Field Production Operations - 631.1 Fluid Flow, General - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
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Compendex references: YES
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98. Difference of Microfeatures among Diagenetic Facies in Tight Sandstone Reservoirs of the Triassic Yanchang Formation in the Midwestern Region, Ordos Basin (*Open Access*)

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Authors: Shi, Jian (1, 2); Wan, Xiaolong (1, 2); Xie, Qichao (1, 2); Zhou, Shuxun (1, 2); Zhou, Yan (3); Ren, Dazhong (4); Zhang, Rongjun (4)
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Oil and Gas Fields, Shaanxi, Xi'an; 710018, China; (3) Cnpc Logging Applied Research Institute, Xi'an; 710077, China; (4) Xi'an Key Laboratory of Tight Oil (Shale Oil) Development, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China
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Source title: Mathematical Problems in Engineering
Abbreviated source title: Math. Probl. Eng.
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Article number: 5611786
Language: English
ISSN: 1024123X
E-ISSN: 15635147
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Based on the background of sedimentary characteristics, a large amount of core and thin section analysis, taking Chang 6 reservoir of Yanchang Formation in the central and western Ordos Basin as an example, through the application of scanning electron microscopy, high-pressure mercury injection, nuclear magnetic resonance and microscopic water drive oil model, and other experimental test methods, the diagenetic facies types and microscopic pore structure characteristics of tight sandstone reservoirs are discussed and analyzed in depth. The results show that the average porosity loss rate caused by early diagenesis compaction in the study area is 50.62%, which is the main reason for reservoir compactness. The cementation further causes porosity loss, and the later dissolution increases the reservoir space in the study area to a certain extent. Different diagenetic facies reservoirs not only have obvious differences in porosity evolution characteristics but also have significant differences in pore throat radius distribution characteristics, movable fluid occurrence characteristics, and water drive oil characteristics. The pore throat distribution with radius greater than R50#R60 determines the permeability. The difference in movable fluid saturation mainly depends on the connectivity of the relative large pore space corresponding to the relaxation time greater than the cut-off value of T2. The size of pore throat radius has a good control effect on water flooding efficiency. © 2021 Jian Shi et al.
Number of references: 28
Main heading: Porosity
Controlled terms: Petroleum reservoir engineering - Sedimentology - Scanning electron microscopy - Metamorphic rocks - Pore structure - Structure (composition) - Testing - Sandstone - Tight gas
Uncontrolled terms: Distribution characteristics - High pressure mercury - Microscopic pore structures - Oil characteristics - Porosity evolutions - Sedimentary characteristics - Tight sandstone reservoirs - Yanchang Formation
Classification code: 481.1 Geology - 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 5.06e+01%
DOI: 10.1155/2021/5611786
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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99. A new model for predicting the critical liquid-carrying velocity in inclined gas wells

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Title of translation:
Authors: Wang, Wujie (1); Cui, Guomin (1); Wei, Yaoqi (2); Pan, Jie (3)
Author affiliation: (1) Shanghai Key Laboratory of Multiphase Flow and Heat Transfer in Power Engineering, School of Energy and Power Engineering, University of Shanghai for Science and Technology, Shanghai; 200093, China; (2) Chinese National Engineering Research Center for Petroleum and Natural Gas Tubular Goods, Baoji; 721008, China; (3) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Cui, Guomin(cgm@usst.edu.cn)
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Pages: 1053-1060
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CODEN: SKYKEG
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Based on the assumption of gas-liquid stratified flow pattern in inclined gas wells, considering the influence of wettability and surface tension on the circumferential distribution of liquid film along the wellbore wall, the influence of the change of the gas-liquid interface configuration on the potential energy, kinetic energy and surface free energy of the two-phase system per unit length of the tube is investigated, and a new model for calculating the gas-liquid distribution at critical conditions is developed by using the principle of minimum energy. Considering the influence of the inclination angle, the calculation model of interfacial friction factor is established, and finally closed the governing equations. The interface shape is more vulnerable to wettability and surface tension at a low liquid holdup, resulting in a curved interface configuration. The interface is more curved when the smaller is the pipe diameter, or the smaller the liquid holdup, or the smaller the deviation angle, or the greater gas velocity, or the greater the gas density. The critical liquid-carrying velocity increases nonlinearly and then decreases with the increase of inclination angle. The inclination corresponding to the maximum critical liquid-carrying velocity increases with the increase of the diameter of the wellbore, and it is also affected by the fluid properties of the gas phase and liquid phase. The mean relative errors for critical liquid-carrying velocity and critical pressure gradient are 1.19% and 3.02%, respectively, and the misclassification rate is 2.38% in the field trial, implying the new model can provide a valid judgement on the liquid loading in inclined gas wells. © 2021, The Editorial Board of Petroleum Exploration and Development. All right reserved.
Number of references: 17
Main heading: Velocity
Controlled terms: Free energy - Density of gases - Oil field equipment - Boreholes - Gases - Kinetics - Phase interfaces - Flow patterns - Surface tension - Friction - Kinetic energy - Liquid films - Potential energy - Wetting
Uncontrolled terms: Bottom-hole liquid loading - Bottomhole - Critical liquid-carrying velocity - Friction factors - Gas liquids - Gas well - Gas-liquid phase distribution - Inclined gas well - Interfacial friction - Interfacial friction factor - Liquid loading - Liquid-phase distribution
Classification code: 511.2 Oil Field Equipment - 631.1 Fluid Flow, General - 641.1 Thermodynamics - 801.4 Physical Chemistry - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 1.19E+00%, Percentage 2.38E+00%, Percentage 3.02E+00%
DOI: 10.11698/PED.2021.05.17
Compendex references: YES
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Data Provider: Engineering Village
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100. Numerical investigating the low field NMR response of representative pores at different pulse sequence parameters

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Authors: Ge, Xinmin (1, 2, 3); Fan, Yiren (1, 3); Liu, Jianyu (1); Zhao, Jier (1); Zeng, Bingding (1); Xing, Donghui (4)
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Language: English
ISSN: 00983004

CODEN: CGEODT
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: We developed a numerical simulation algorithm to explore the nuclear magnetic resonance (NMR) response of the porous media based on the Carr-Purcell-Meiboom-Gill (CPMG) pulse sequence and the Bloch equation. The evolution of the magnetization vector of two representative pores at different pulse properties, including the excitation angle, the refocusing angle, the phase angle, as well as the pulse duration are simulate to understand the NMR relaxation signals. The result showed that the normalized magnetization is symmetrical with the excitation angle and positive with the T2 spectrum's amplitude when the excitation angle is less than 90°. In additional, the refocusing angle has no clear influence on the NMR response. The phase angle of the excitation pulse is inversely correlated with the echo amplitude and can be neglected when the value is lower than 15°. The phase angle of the refocusing pulse causes the zig-zag phenomenon, but the response of the even echoes is not disturbed. Moreover, the influence of the pulse duration should not be neglected at higher values, particularly for the mesopore. The simulation results are helpful for the design and optimization of the pulse sequence, and the data manipulation of the measured signals. © 2021 Elsevier Ltd
Number of references: 53
Main heading: Magnetization
Controlled terms: Nuclear magnetic resonance - Porous materials
Uncontrolled terms: Carrpurcell-meiboom-gill (CPMG) - Data manipulations - Design and optimization - Excitation angles - Excitation pulse - Magnetization vector - Nuclear magnetic resonance(NMR) - Numerical simulation algorithms
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 951 Materials Science
DOI: 10.1016/j.cageo.2021.104761
Funding Details: Number: MMRZZ201805,SXCU-201904, Acronym: QNLM, Sponsor: Qingdao National Laboratory for Marine Science and Technology; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 19CX02006A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work was supported by the Fundamental Research Funds for the Central Universities (19CX02006A), the Laboratory for Marine Mineral Resources, Qingdao National Laboratory for Marine Science and Technology (MMRZZ201805), and Open Fund (SXCU-201904) of Shaanxi cooperative innovation center of unconventional oil and gas exploration and development (Xi'an Shiyou University). We also thank the comments and suggestions from the anonymous reviewers.
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Data Provider: Engineering Village
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101. Bismuth metal organic framework-derived Bi2Se3@C for high performance supercapacitors

Accession number: 20215011308980
Authors: Qin, Hengjie (1); Lv, Ying (1); Li, Ping (1); Xiao, Meixia (1); Song, Haiyang (1); Zhang, Qian (2); Yang, Jialun (2)
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Pages: 21888-21895
Language: English
ISSN: 11440546
E-ISSN: 13699261
CODEN: NJCHE5
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A series of Bi2Se3@C materials were prepared through a bismuth metal organic framework (CAU-17) assisted hydrothermal selenization method followed by carbonization, which have been found to be useful as electrode

materials for supercapacitor application. The Bi2Se3@C obtained below 500 °C seems to show an excellent specific capacity of 565.9 C g-1 at a current density of 1 A g-1. Furthermore, the performance of Bi2Se3@C in symmetrical supercapacitors (SSCs) is also systemically investigated, and the SSC device achieves a maximum energy density of 39.3 W h kg-1 at a power density of 639.9 W kg-1 and maintains 90.5% of this capacity over 1000 cycles. © The Royal Society of Chemistry and the Centre National de la Recherche Scientifique.
Number of references: 57
Main heading: Organometallics
Controlled terms: Supercapacitor - Carbonization - Bismuth - Crystalline materials
Uncontrolled terms: Carbonisation - Electrode material - Energy density - Metalorganic frameworks (MOFs) - Performance - Power densities - Selenization methods - Specific capacities - Supercapacitor application
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 704.1 Electric Components - 802.2 Chemical Reactions - 804.1 Organic Compounds - 933.1 Crystalline Solids
Numerical data indexing: Electric current 1.00E00A, Percentage 9.05E+01%, Power 3.93E+01W, Power 6.399E +02W, Temperature 7.73E+02K
DOI: 10.1039/d1nj03904k
Funding Details: Number: YCS20211046, Acronym: -, Sponsor: -; Number: 51801155, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2021JZ-53, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2021JQ-581, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This study is financially supported by the Natural Science Basic Research Program of Shaanxi (Program No. 2021JQ-581). Meanwhile, this work is also funded by Innovation Team Funding: Design and Application of Metal Functional Materials from Xi'an Shiyou University, the Young Scientists Fund of the National Natural Science Foundation of China (Grant No. 51801155), the Natural Science Foundation of Shaanxi Province, China (Grant No. 2021JZ-53 and 2021JQ-581), and the Graduate students' innovation ability and practice ability training program (No. YCS20211046).
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Database: Compendex
Data Provider: Engineering Village
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102. Study of water saturation in electrically anisotropic media based on conductivity tensor

Accession number: 20213510848126
Authors: Geng, Rong (1); Gao, Yujue (1); Liu, Xu (2); Zhang, Zhitao (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Key Laboratory Photoelectric Logging and Detecting, Ministry of Education, Xi an, China; (2) China Petroleum Logging Co. Ltd., Xi an, China
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Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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Issue date: July 23, 2021
Publication year: 2021
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Article number: 9513400
Language: English
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The formation electrical anisotropy means that the formation apparent resistivity changes with the direction of measurement when the formation apparent resistivity is measured. Because the electrical conductivity tensor measured by the well logging instrument coincides with the component measured in the core analysis, other tensor components are often ignored in formation evaluation. The electrical anisotropy of the laboratory core is indicated by

the conductivity tensor scale. It is difficult to obtain the nine components of the conductivity tensor completely in one experiment with the conductivity tensor measuring instrument. The water saturation can be calculated according to the resistivity measured by the Archie formula logging instrument. The common method is to establish the relation of the main axis components of the conductivity tensor on water saturation respectively according to the scalar Archie formula, so as to derive the tensor expression of water saturation. In this paper, based on the literature research results, the conductivity tensor measuring instrument is used to measure the square core, and the 9 components of the conductivity tensor of the core are measured, and the expression of Archie tensor which can be applied to the laboratory is discussed. The unknown coefficients of Archie formula are determined by laboratory data. © 2021 IEEE.
Number of references: 5
Main heading: Tensors
Controlled terms: Anisotropy - Anisotropic media
Uncontrolled terms: Apparent resistivity - Conductivity tensors - Electrical anisotropy - Electrical conductivity tensor - Formation evaluation - Literature researches - Measuring instruments - Unknown coefficients
Classification code: 921.1 Algebra - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1109/ICMSP53480.2021.9513400
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Database: Compendex
Data Provider: Engineering Village
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103. Research on the calculation method of resistivity logging based on 2.5-D finite difference method

Accession number: 20213510848133
Authors: Gao, Yujue (1); Geng, Rong (1); Liu, Xu (2); Wang, Pengfei (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Key Laboratory Photoelectric Logging and Detecting, Ministry of Education, Xi an, China; (2) China Petroleum Logging Co. Ltd, Xi an, China
Corresponding author: Gao, Yujue(1160319650@qq.com)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Publication year: 2021
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Article number: 9513408
Language: English
ISBN-13: 9781665437158
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Compared with one-dimensional and three-dimensional modeling, the finite difference method is used to carry out 2.5D modeling calculation. the physical reality and calculation cost are taken into account. At the same time, the problem is changed into a frequency domain problem, the time variable is eliminated, the calculation process is simplified, and the calculation efficiency is greatly improved. © 2021 IEEE.
Number of references: 5
Main heading: Finite difference method
Controlled terms: Frequency domain analysis
Uncontrolled terms: 2.5-D finite difference method - Calculation cost - Calculation efficiency - Calculation process - Frequency domains - Model calculations - Resistivity logging - Three-dimensional model
Classification code: 921.3 Mathematical Transformations - 921.6 Numerical Methods
DOI: 10.1109/ICMSP53480.2021.9513408
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Database: Compendex
Data Provider: Engineering Village
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104. Research on UDE control based on load torque compensation of PMSM (*Open Access*)

Accession number: 20220411535745
Authors: Yan, Hongliang (1); Zhai, Weizhi (1); Geng, Yan (1)
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Corresponding author: Zhai, Weizhi(1139322914@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 2137
Part number: 1 of 1
Issue: 1
Issue title: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
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Article number: 012024
Language: English
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Document type: Conference article (CA)
Conference name: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
Conference date: October 29, 2021 - October 31, 2021
Conference location: Xi'an, Virtual, China
Conference code: 176003
Publisher: IOP Publishing Ltd
Abstract: In order to solve the problem that the traditional uncertainty and disturbance estimator (UDE) control needs to increase the filter order to keep good performance when facing rapid disturbance changes,thus lead to cost increase in implementing the system, a speed control strategy of permanent magnet synchronous motor (PMSM) driver based on reduced order observer compensation is proposed. The designed control strategy is robust to the system with internal parameter variation and external torque disturbance. Through the compensation of load torque, the pressure of UDE controller is relieved, and then the tracking error of high-frequency component in load torque is eliminated, and the control performance of the system is improved more effectively. This paper proves the superiority of the new compound controller through comparison of simulation results. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 5
DOI: 10.1088/1742-6596/2137/1/012024
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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105. A new method for predicting formation lithology while drilling at horizontal well bit

Accession number: 20204209359656
Authors: Sun, Jian (1); Chen, Mingqiang (1); Li, Qi (1, 2); Ren, Long (1); Dou, Mengyuan (1); Zhang, Jixuan (3)
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Corresponding author: Sun, Jian(xjkelsj@163.com)
Source title: Journal of Petroleum Science and Engineering
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Publication year: 2021
Article number: 107955
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The identication of lithology while drilling with horizontal well bit is a difficult problem to solve in geosteering. However, due to the existence of "zero length" (the distance between the logging tool and the bit), the lithology at the horizontal well bit cannot be accurately interpreted in real time, which creates a lag in geosteering. Based on logging while drilling (LWD) technology, this paper uses supervised learning in machine learning methods, conventional logging interpretation technology and big data idea in modern computer science, through interdisciplinary theories and methods to research lithology prediction for horizontal well bits in reservoirs. First, a measurement point and vertical reservoir boundary distance (D-MP-VRB) database is built according to different step size categories. Second, based on the D-MP-VRB database, D-MP-VRB prediction models are established using one-versus-one support vector machines (OVO SVMs), random forest (RF), neural networks (NN), and extreme gradient boosting tree (XGBoost) algorithms. To reduce the dimensions of the input data, the feature parameters of the samples are obtained by a correlation analysis of the logging data. The optimal parameter values of each algorithm are determined by grid search and 10-fold cross-validation methods. Finally, the prediction formula of the bit and vertical reservoir boundary distance based on the D-MP-VRB prediction model is established. A case study is performed with data from a sandstone reservoir in Changqing oilfield, Ordos Basin, China. On this basis, the lithology predictions at the bit in real time are carried out by using four models. Considering the principle of model prediction accuracy, through 1320 experiments, only the XGBoost prediction model can be selected, and the step size of the target category is 2 m, however, this model takes the longest time to train. Therefore, the reliable prediction model trained by the sample data of the original training set is used to predict the reservoir information encountered by horizontal well. After the newly drilled reservoir information has accumulated to a certain amount and accurately explained, it is added to the original training set sample data, and the prediction model is retrained to improve the accuracy and adaptability of the model. Based on the prediction results of the XGBoost model and the prediction formula, the distance prediction between the horizontal well bit and the vertical reservoir boundary is realized, real-time lithology correction at the bit is realized, and the adverse effect of the "zero length" on the lithology prediction at the bit is reduced. The research results provide not only a new method for the real-time prediction of lithology in horizontal well bits but also a theoretical basis for the geosteering of oilfield development and valuable information for future research. © 2020 Elsevier B.V.
Number of references: 56
Main heading: Forecasting
Controlled terms: Lithology - Horizontal wells - Support vector machines - Random forests - Engineering education - Infill drilling - Decision trees - Learning systems - Logging while drilling
Uncontrolled terms: 10-fold cross-validation - Conventional logging - Correlation analysis - Logging while drilling technologies - Machine learning methods - Ordos basin , China - Real-time prediction - Sandstone reservoirs
Classification code: 481.1 Geology - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 723 Computer Software, Data Handling and Applications - 723.4.2 Machine Learning - 901.2 Education - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
Numerical data indexing: Size 2.00e+00m
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106. Mathematical model of reactive power optimization for distributed photovoltaic distribution network

Accession number: 20211710252582
Authors: Wu, Xiaomeng (1, 2); Feng, Guo (1); Wang, Qianyu (1); Ren, Fu (1); Wang, Shangkun (1); Liu, Yutong (1)
Author affiliation: (1) Xi'an Shiyou University, School of Electric Engineering, Xi'an, China; (2) Key Laboratory of Measurement and Control Technique of Oil and Gas Wells of Shaanxi Province, Xi'an, China
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Document type: Conference article (CA)
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Conference date: March 12, 2021 - March 14, 2021
Conference location: Chongqing, China
Conference code: 168296
Sponsor: Chengdu Union Institute of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Global Union Academy of Science and Technology; IEEE Beijing Section
Abstract: In recent years, photovoltaic has been developing rapidly, which is of great significance to the research of reactive power optimization for distributed photovoltaic large scale connected distribution networks. The mathematical model of reactive power optimization in distributed photovoltaic distribution network is introduced in this paper, including the introduction of reactive power optimization algorithms and the object function and restrictions of reactive power optimization modeling. © 2021 IEEE.
Number of references: 16
Main heading: Reactive power
Controlled terms: Functions
Uncontrolled terms: Object functions - Photovoltaic - Reactive power optimization
Classification code: 921 Mathematics
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Funding text: This paper is supported by the Key Project of Shaanxi Provincial Education Department (18JS094), Natural Science Basic Research Program of Shaanxi(Prog ram No. 2020JM-542), College Student Innovation and Entrepreneurship Training Program of Shaanxi Province (S201910705070, S202010705101).
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Database: Compendex
Data Provider: Engineering Village
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107. Multi-coil array for long-distance cross-well electromagnetic detection

Accession number: 20213510848020
Authors: Dang, Jingxin (1); Zhao, Qing (1); Guo, Cheng (1); Li, Jiadai (1); Zhang, Lei (1); Dang, Bo (2)
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Corresponding author: Dang, Jingxin(15029276190@163.com)
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Language: English
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021

Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Cross-well electromagnetic detection technology is an important geophysical exploration method, which is widely used in oil and gas development, underground resource acquisition and engineering environmental geophysical prospecting. At present, some scholars have developed relatively mature cross-well electromagnetic logging tools that can realize long-distance oil and gas logging. However, these tools are bulky and complicated to operate, so they are not suitable for small-diameter wells. Therefore, this paper proposes a multi-coil array probe for cross-well electromagnetic to realize the long-distance detection of small-diameter wells. The probe is mainly composed of the transmitter coil and the receiver coil. It is small in size, easy to carry, and can achieve high-power transmission and high-sensitivity reception. According to simulation and experimental results, the research can achieve long-distance detection up to 300 meters. © 2021 IEEE.
Number of references: 8
Main heading: Probes
Controlled terms: Electromagnetic logging - Oil field development - Environmental technology - Oil well logging - Petroleum prospecting - Geophysics
Uncontrolled terms: Distance detection - Electromagnetic detection - Geophysical exploration methods - High power transmission - High sensitivity - Receiver coil - Transmitter coils - Underground resources
Classification code: 454 Environmental Engineering - 481.3 Geophysics - 512.1.2 Petroleum Deposits : Development Operations - 701 Electricity and Magnetism
Numerical data indexing: Size 3.00e+02m
DOI: 10.1109/ICMSP53480.2021.9513342
Funding Details: Number: 2018YFC0603303, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
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Compendex references: YES
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Data Provider: Engineering Village
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108. Images super-resolution using improved generative adversarial networks

Accession number: 20213510848003
Authors: Hu, Yuliang (1, 2); Jing, Mingli (1, 2); Jiao, Yao (1, 2); Sun, Kun (1, 2)
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Corresponding author: Jing, Mingli(jml506@yeah.net)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Publication year: 2021
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Article number: 9513225
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Image super-resolution (ISR) is an important image processing technology to improve image resolution in computer vision tasks. The purpose of this paper is to study the super-resolution reconstruction of single image

based on the depth learning method. Aiming at the problem that the existing pixel loss-based super-resolution image reconstruction algorithms have poor reconstruction effect on high-frequency details, such as textures, a lighter algorithm is proposed on the basis of the existing deep learning method (SRGAN). Firstly, the feedback structure is applied in the generator to process the feedback information and enhance the high frequency information of the image. Secondly, a general residual feature aggregation framework (RFA), is applied to make full use of the residual information of each layer to improve the quality of the SR image. Finally, the solution space of the function is further reduced and the image quality is improved by using a new loss function. The algorithms are implemented on pytorch framework. The experimental results on VOC2012 data sets show that, compared with the original SRGAN algorithm, the peak signal-to-noise ratio (PSNR) and structural similarity (SSIM) of the proposed algorithm on the benchmark data set Set5 are improved by 0.83dB and 0.028, respectively, on Set14, the PSNR and SSIM of the proposed algorithm are improved by 0.56dB and 0.009, on Urban100, the PSNR and SSIM of the proposed algorithm are improved by 0.51dB and 0.031, on BSD100, the PSNR and SSIM of the proposed algorithm are improved by 0.33dB and 0.014, and compared with other improved algorithms, the effect of this algorithm is also better than other algorithms. © 2021 IEEE.
Number of references: 23
Main heading: Generative adversarial networks
Controlled terms: Deep learning - Image enhancement - Signal to noise ratio - Textures - Learning systems - Convolutional neural networks - Image reconstruction - Image resolution - Image quality
Uncontrolled terms: Feed back information - High-frequency informations - Image processing technology - Image super resolutions - Peak signal to noise ratio - Structural similarity - Super resolution image reconstruction algorithm - Super resolution reconstruction
Classification code: 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence
Numerical data indexing: Decibel 3.30e-01dB, Decibel 5.10e-01dB, Decibel 5.60e-01dB, Decibel 8.30e-01dB
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Compendex references: YES
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109. Research on weibull distribution theory for cubic compressive strength test method of raw earth materials with different curing methods and time

Accession number: 20214911287217
Authors: Zhang, Kun (1); Lu, Bai-Ru (2); Zhang, Xun-An (3); Wang, Yi-Hong (4); Qu, Zhan (5)
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Source title: Key Engineering Materials
Abbreviated source title: Key Eng Mat
Volume: 896 KEM
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Conference name: 6th International Conference on Building Materials and Construction, ICBMC 2021, Nanotechnology and Nanomaterials in Energy, ICNNE 2021, and Energy Engineering and Smart Materials, ICEESM 2021
Conference date: April 28, 2021 - April 30, 2021
Conference location: Virtual, Online
Conference code: 268999
Publisher: Trans Tech Publications Ltd
Abstract: Cube compressive strength of raw-soil based mater is an important index of mechanical property. Because the test results vary by different curing modes and trial curing time, compressive strength test on 160 cubic raw-soil test-pieces which were made by 4 curing modes (natural curing, indoor curing, indoor+ preservative film curing, curing in standard curing chamber) and 4 Curing period (4d, 14d, 21d, 28d) was designed.In this study,the failure mechanism, failure mode, force mechanism of test were analyzed.Using Weibull distribution theory, the influence of different environmental factors on material strength is discussed.The research revealed that the different curing methods and curing time had remarkable effect on failure mode of material, but the load displacement curves had not affected. The compressive strength with 21d and 28d 's indoor curing and standard curing method were same in the test.The strength of raw soil increases with time, and the curing temperature had a significant effect on the early strength of raw soil materials, but had little effect on the later strength. The humidity had a great influence on the later growth of material strength. Constant temperature and humidity could effectively ensure the full response of internal water loss hardening of raw soil-based materials, and the strength of specimens increases obviously.The recommended curing mode and standard curing time for standard test of raw-soil test-pieces were temperature of 25-30°C, humidity of 50%-55%, and 28day, respectively. © 2021 Trans Tech Publications Ltd, Switzerland.
Number of references: 22
Main heading: Compressive strength
Controlled terms: Curing - Failure (mechanical) - Soils - Weibull distribution - Soil testing
Uncontrolled terms: Curing methods - Curing periods - Curing time - Distribution theory - Earth materials - Failure mechanism - Raw soils - Soil-tests - Strength tests - Test method
Classification code: 483.1 Soils and Soil Mechanics - 802.2 Chemical Reactions - 922.2 Mathematical Statistics
Numerical data indexing: Age 7.672E-02yr, Percentage 5.00E+01% to 5.50E+01%, Temperature 2.98E+02K to 3.03E+02K
DOI: 10.4028/www.scientific.net/KEM.896.129
Funding Details: Number: 2019JQ-554, Acronym: -, Sponsor: -; Number: 2019XJZK01, Acronym: -, Sponsor: -; Number: 51478043, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The research for this project was supported by the National Natural Science Foundation of China, for the Study on the Standard Test Method of Materials and Masonry Based on Raw-soil (51478043). And the Shaanxi Natural Science Basic Research Program(2019JQ-554). School-level scientific research fund project of Xi'an Eurasian College(2019XJZK01). Their financial support is highly appreciated.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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110. An Efficient Randomized QLP Algorithm for Approximating the Singular Value Decomposition

Accession number: 20210360989
Authors: Kaloorazi, M.F. (1); Liu, K. (2); Chen, J. (2); de Lamare, R.C. (3)
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Source title: arXiv
Abbreviated source title: arXiv
Issue date: October 3, 2021
Publication year: 2021
Language: English
E-ISSN: 23318422
Document type: Preprint (PP)
Publisher: arXiv
Abstract: In this paper, we introduce a randomized QLP decomposition called Rand-QLP. Operating on a matrix A, Rand-QLP gives A = QLPT, where Q and P are orthonormal, and L is lower-triangular. Under the assumption that the rank of the input matrix is k, we derive several error bounds for Rand-QLP: bounds for the first k approximate singular

values and for the trailing block of the middle factor L, which show that the decomposition is rank-revealing; bounds for the distance between approximate subspaces and the exact ones for all four fundamental subspaces of a given matrix; and bounds for the errors of low-rank approximations constructed by the columns of Q and P. Rand-QLP is able to effectively leverage modern computational architectures, due to the utilization of random sampling and the unpivoted QR decomposition, thus addressing a serious bottleneck associated with classical algorithms such as the singular value decomposition (SVD), column-pivoted QR (CPQR) and most recent matrix decomposition algorithms. To assess the performance behavior of different algorithms, we use an Intel Xeon Gold 6240 CPU running at 2.6 GHz with a NVIDIA GeForce RTX 2080Ti GPU. In comparison to CPQR and the SVD, Rand-QLP respectively achieves a speedup of up to 5 times and 6.6 times on the CPU and up to 3.8 times and 4.4 times with the hybrid GPU architecture. In terms of quality of approximation, our results on synthetic and real data show that the approximations by Rand-QLP are comparable to those of pivoted QLP and the optimal SVD, and in most cases are considerably better than those of CPQR. © 2021, CC BY-NC-ND.
Number of references: 45
Main heading: Singular value decomposition
Controlled terms: Approximation theory - Computer architecture - Error analysis - Graphics processing unit - Random errors
Uncontrolled terms: Communication avoiding algorithms - High-performance computing - Hybrid architectures - matrix - Orthonormal - Performance computing - Pivoted QLP - Randomized sampling - Rank-revealing - Rank-revealing decomposition
Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 721.3 Computer Circuits - 921 Mathematics - 921.6 Numerical Methods
Numerical data indexing: Frequency 2.60E+09Hz
DOI: 10.48550/arXiv.2110.01011
Preprint ID: 2110.01011v2
Preprint source website: https://arxiv.org
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Database: Compendex
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111. Effect of Al-5Ti-0.8C Master Alloy on Microstructure and Elevated Temperature Mechanical Properties of Al-Cu-Mn Alloy

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Title of translation: Al-5Ti-0.8CAl-Cu-Mn
Authors: Zhang, Guowei (1); Niu, Jingwei (1); Xu, Hong (1); Jia, Hongmin (2)
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Publisher: Science Press
Abstract: A new kind of Al-5Ti-0.8C master alloy was fabricated using a self-propagating combustion reaction method and dilution treatment, and the effects of different Al-5Ti-0.8C master alloy contents (0wt%, 0.1wt%, 0.3wt%, 0.5wt%) on the microstructure and elevated temperature mechanical properties of Al-Cu-Mn alloy were investigated. The results show that the Al-5Ti-0.8C master alloy refines the Al-Cu-Mn alloy, increases the amount of #'(Al2Cu) precipitates, and reduces their size during heat treatment, resulting in the grain refinement. Moreover, this new master alloy obviously improves the elevated temperature mechanical properties of Al-Cu- Mn alloy, mainly due to the precipitation strengthening caused by the uniform distribution of second phases and fine #' (Al2Cu) precipitates, and the formation of Al3(Ti, Zr) nanoparticles with high thermal stability. Furthermore, the microstructure and mechanical properties of Al-

Cu-Mn alloy with 0.3wt% Al-5Ti-0.8C master alloy show the optimal status. Copyright © 2021, Northwest Institute for Nonferrous Metal Research. Published by Science Press. All rights reserved.
Number of references: 40
Main heading: Ternary alloys
Controlled terms: Manganese alloys - Copper alloys - Grain size and shape - Binary alloys - Aluminum alloys - Grain refinement - Microstructure - Heat treatment - Precipitation (chemical) - Titanium alloys
Uncontrolled terms: Cu-Mn alloys - Elevated temperature mechanical property - High thermal stability - Master alloys - Microstructure and mechanical properties - Precipitation strengthening - Self-propagating combustion - Uniform distribution
Classification code: 537.1 Heat Treatment Processes - 541.2 Aluminum Alloys - 542.3 Titanium and Alloys - 543.2 Manganese and Alloys - 544.2 Copper Alloys - 802.3 Chemical Operations - 951 Materials Science
Funding Details: Number: 88382536, Acronym: -, Sponsor: -;
Funding text: Receiveddate:November19,2020 Foundation item:Applied Basic Research Project of Shanxi Province, China (201801D121 1 1 1) Corresponding author: Jia Hongmin, Ph. D., School of Materials Science and Engineering, Xian Shiyou University , 88382536, E-mail: hmjia12s@alum.imr .ac.cn
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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112. Corrosion behavior on titanium alloys as octg in oil fields

Accession number: 20214911279130
Authors: Wang, Xinyu (1); Zhu, Shidong (1); Liu, Qiang (2); Fu, Anqing (2); Li, Jinling (3)
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Corresponding author: Zhu, Shidong(zhusd@xsyu.edu.cn)
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Conference name: 3rd International Conference on Materials Science and Industrial Applications, MSIA 2021
Conference date: January 16, 2021 - January 17, 2021
Conference location: Virtual, Online
Conference code: 269079
Publisher: Trans Tech Publications Ltd
Abstract: Titanium alloys have been taken as Oil Country Tubular Goods (OCTG) owing to their higher strength, and better corrosion resistance, but there are some problems in their application process. The corrosion types of titanium alloys were emphatically discussed, and corrosion mechanism was analyzed in this paper. The results showed that the main corrosion type of titanium alloys in hydrochloric acid was pitting, and the surface roughness of titanium alloys could affect it. The critical current density of titanium alloys in phosphoric acid was closely related to temperature and phosphoric acid concentration. The passivation of titanium alloys could be carried out by the growing oxide film at low current density, to achieve the higher stability of passivating film in the concentrated sulfuric acid. Titanium alloys suffered from more serious corrosion in the CO2containing completion fluid environment than that in the CO2-containing formation water environment. H2S would cause electrochemical corrosion and stress corrosion of titanium alloy pipe, leading to hydrogen embrittlement and even cracking of OCTG. Passivating film was the key to corrosion resistance of titanium alloys, and its composition would change with the depth of the film, presenting N-type. The

dynamic corrosion of titanium alloys was mainly controlled by charge transfer. © 2021 Trans Tech Publications Ltd, Switzerland.
Number of references: 36
Main heading: Titanium alloys
Controlled terms: Pipeline corrosion - Corrosive effects - Passivation - Surface roughness - Charge transfer - Corrosion resistant alloys - Electrochemical corrosion - Oxide films - Titanium oxides - Oil fields - Corrosion resistance
Uncontrolled terms: Application process - Corrosion behaviour - Corrosion mechanisms - Corrosion types - High-strength - Oil country tubular goods - Passivating films - Pittings - TC4 - Titanium (alloys)
Classification code: 512.1.1 Oil Fields - 531 Metallurgy and Metallography - 539.1 Metals Corrosion - 539.2.1 Protection Methods - 542.3 Titanium and Alloys - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.4028/www.scientific.net/MSF.1032.195
Funding Details: Number: YCS20113057, Acronym: -, Sponsor: -; Number: 2020KJRC0097,2020KJRC0098, Acronym: -, Sponsor: -; Number: 21808182,51974245, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JM472,2019JM506, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 18JS088, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work was supported by National Natural Science Foundation of China (51974245, 21808182), Scientific Research Program of Shaanxi Provincial Education Department (18JS088), Natural Science Basic Research Plan in Shaanxi Province of China (2019JM472, 2019JM506), Xi'an Science and Technology Planning Project (2020KJRC0097, 2020KJRC0098), and Postgraduate Innovation and Practical Ability Training Program (YCS20113057).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

113. Extracting of Near-bit Attitude Signals Using DWT

Accession number: 20211910343129
Authors: Mao, Yanhui (1); Gao, Yi (1); Wang, Yuelong (1); Zhang, Ke (1)
Author affiliation: (1) Xi'an Petroleum University, School of Electronic Engineering, Xi'an, Shanxi, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 462-465
Article number: 9408724
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Steerable drilling is the key technology in oil/gas drilling development. However, the near-bit measurements are usually contaminated by noises resulting from drilling tool vibration and high-speed rotary. This study proposes a new extraction scheme, which can remove the vibration and rotary noises powerfully and extract the useful gravity measurements based on the discrete wavelet transform. Illustration examples are provided to verify the effectiveness and usefulness of our proposed measures. © 2021 IEEE.
Number of references: 25
Main heading: Discrete wavelet transforms
Controlled terms: Signal reconstruction - Extraction - Infill drilling
Uncontrolled terms: Drilling tool - Gravity measurement - High Speed - Key technologies - Rotary noise - Steerable drillings
Classification code: 511.1 Oil Field Production Operations - 716.1 Information Theory and Signal Processing - 802.3 Chemical Operations - 921.3 Mathematical Transformations
DOI: 10.1109/ICSP51882.2021.9408724

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Funding text: Ac kn o w l ed g men t Project supported by the Natural Science Foundation of Shaanxi Province (Grant No. 2019JQ-366), the Joint Funds of the National Natural Science Foundation of China for Enterprise Innovation andDevelopment (Grant No. U20B2029), Key Laboratory Scientific research plan of Shaanxi Provincial Education Department (Grant No. 17JS108).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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114. Locating microseismic events using multiplicative time reversal imaging based on decoupled wavefields in 2D VTI media: Theoretical and synthetic cases studies (*Open Access*)

Accession number: 20210809952801
Authors: Li, Meng (1, 2, 3); Shen, Hongyan (1, 3); Guo, Yuhua (4); Mengxiong, Xiao (5)
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Corresponding author: Li, Meng(meli@xsyu.edu.cn)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 202
Issue date: July 2021
Publication year: 2021
Article number: 108547
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Estimation of microseismic event location is of great significance in unconventional resources development and exploitation with its advantage of imaging the fractures induced by hydraulic fracturing stimulation. Time reversal imaging technique (TRI), which reversely propagates the recorded microseismic energy to refocus to its real location, has been verified as a satisfying method in noisy environment. However, the location images obtained from TRI techniques are frequently smeared with strong imaging noises and artifacts resulting from the cross talk of coupled wave modes coinciding in space and time with sparse measurements especially in heterogeneous anisotropic media, resulting in erroneous location estimations. To mitigate these disturbances, a multiplicative time reversal imaging method based on decoupled wavefields is proposed (DC-MTRI). Wave-mode separators constructed based on Christoffel equation are first utilized to fully separate quasi P wave (qP) and quasi vertically pozlarized shear wave (qSV) wavefields at each receiver in 2D vertical transverse isotropy (VTI) media. Multiplicative time reversal imaging condition is then applied to the auto and cross-correlations of decoupled wavefields of each receiver to construct the final location image. The synthetic examples show that the wave-mode separators applied in this paper can fully separate qP and qSV potentials in 2D VTI media compared to Helmholtz decomposition. As a consequence, the proposed method substantially improves the quality of the location image with a much sharper focus and less noisy imaging energy at shallow depth of the sophisticated Sigesbee 2A model. In addition, the numerical experiments show that DC-MTRI can give robust source location images with distinct radiation pattern of high resolution for sparse acquisition plan. Furthermore, DC-MTRI has same sensitivity on velocity perturbations compared with conventional TRI techniques. Therefore, the proposed technique can potentially be employed as the constraints to estimate source mechanism and update the velocity structure in the future. © 2021 Elsevier B.V.
Number of references: 44
Main heading: Location
Controlled terms: Shear flow - Separation - Resource valuation - Separators - Seismology - Shear waves - Seismic waves - Image enhancement
Uncontrolled terms: Christoffel equation - Helmholtz decomposition - Microseismic events - Numerical experiments - Time reversal imaging - Unconventional resources - Velocity perturbation - Vertical transverse isotropies

Classification code: 484 Seismology - 484.1 Earthquake Measurements and Analysis - 631.1 Fluid Flow, General - 802.3 Chemical Operations - 931.1 Mechanics
Numerical data indexing: Electric_Current 2.00e+00A
DOI: 10.1016/j.petrol.2021.108547
Funding Details: Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: 20190704, Acronym: SUST, Sponsor: Shaanxi University of Science and Technology; Number: 19JK0661, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2019JQ-817, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This study is supported by Open Fund (PLC2020028) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology), Natural Science Basic Research Program of Shaanxi (2019JQ-817), Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 19JK0661) and Young Talent fund of University Association for Science and Technology in Shaanxi, China (Program No. 20190704).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

115. Effect of Different Exercise Intensities on Hepatocyte Apoptosis in HFD-Induced NAFLD in Rats: The Possible Role of Endoplasmic Reticulum Stress through the Regulation of the IRE1/JNK and eIF2 α /CHOP Signal Pathways (*Open Access*)

Accession number: 20211510184683
Authors: Ruan, Ling (1); Li, Fanghui (2); Li, Shoubang (1); Zhang, Mingjun (1); Wang, Feng (1); Lv, Xianli (1); Liu, Qin (1)
Author affiliation: (1) Department of Physical Education, Xi'An Shiyou University, Ankang Traditional Chinese Medicine, Xi'an, Ankang; Shaanxi, China; (2) School of Sports Sciences, Nanjing Normal University, Nanjing; Jiangsu, China
Corresponding author: Ruan, Ling(36345901@qq.com)
Source title: Oxidative Medicine and Cellular Longevity
Abbreviated source title: Oxidative Med. Cell. Longevity
Volume: 2021
Issue date: 2021
Publication year: 2021
Article number: 6378568
Language: English
ISSN: 19420900
E-ISSN: 19420994
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Objective. To investigate the impact of different-intensity exercise on lipid metabolism, oxidative stress, hepatocyte injury, and apoptosis and the related protein expression of endoplasmic reticulum stress on nonalcoholic fatty liver disease rats. Method. 50 male Sprague-Dawley rats, 2 months old, were randomly divided into the normal control (CON) group, high-fat diet (HFD) group, low-intensity exercise (LIE) group, moderate-intensity exercise (MIE) group, and incremental-intensity exercise (IIE) group. Blood lipids were tested by the automatic biochemical analyzer. The changes in liver tissues were observed by hematoxylin-eosin staining (HE). The protein expression of Bax andBcl-2 was detected by the immunohistochemical method. The apoptosis of hepatocytes was detected by the TUNEL method. The protein expression of GRP78, Caspase-3, IRE1, p-IRE1, JNK1, CHOP, PERK, eIF2#, and ATF4 was detected by Western blotting. Results. Our study showed that compared with the HFD group, TG, TC, FFA, and LDL-c were reduced in all exercise groups. The different exercise intensities could reduce the protein expression of ATF4, Bax, and hepatocyte apoptosis. Meanwhile, the antioxidant function and Bcl-2 were increased. However, the moderate-intensity exercise demonstrated more effect on improving the antioxidant capacity and inhibiting hepatocyte apoptosis. Compared with the HFD group, Caspase-3 and JNK were significantly decreased in all exercise groups (P © 2021 Ling Ruan et al.
Number of references: 38
Main heading: Cell death
Controlled terms: Diseases - Rats - Proteins - Blood - Lipids - Antioxidants

Uncontrolled terms: Antioxidant capacity - Biochemical analyzers - Endoplasmic reticulum stress - Immunohistochemical methods - Non-alcoholic fatty liver disease - Possible mechanisms - Protein expressions - Sprague-Dawley rats
Classification code: 461.2 Biological Materials and Tissue Engineering - 461.9 Biology - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Age 1.67e-01yr
DOI: 10.1155/2021/6378568
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

116. Soft-sediment deformation structures in a lacustrine depositional context: An example from the Eocene Dongying Depression in the Bohai Bay Basin, East China

Accession number: 20214711189019
Authors: Meng, Jiayi (1); Jiang, Zaixing (1); Yang, Yepeng (1); Nian, Tao (2)
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Language: English
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Publisher: Elsevier B.V.
Abstract: The study documents soft-sediment deformation structures (SSDSs) in the lacustrine Dongying Depression, a Paleogene synrift basin located in the southeastern corner of the Bohai Bay Basin, East China. The focus of this study is the lower part of the upper 4th member of the Eocene Shahejie Formation (Es4U), characterized by littoral to sublittoral deposits in the southwestern Dongying Depression. Nine lithofacies are grouped into the upper shoreface facies associations (FA1-1), lower shoreface facies associations (FA1-2), and sublittoral facies associations (FA2). Fine-grained calcareous sandstone was mainly deposited in FA1-1, with thinly alternating calcareous mudstone and siltstone or sandstone in FA1-2, while deposition in FA2 was dominated by mudstone, containing sediment gravity flow deposits. The SSDSs widely encountered in the lower Es4U can be classified into seven categories: (1) load structures, (2) water-escape structures, (3) folds and convolute lamination, (4) sediment-injection structures, (5) microfaults, (6) autoclastic breccias, and (7) slumps. Detailed observations of SSDSs from cores indicate liquefaction and fluidization as the main deformation mechanisms in the sands and muds. Moreover, rupturing of cohesive deposits also contributes to the soft-sediment deformation. The types and morphologies of the SSDSs are closely related to the rheologies of the sediments (e.g., the sand content), influenced by the facies that determine the lithologies and stratigraphic stacking patterns. Except for some deformation structures related to subaqueous sediment gravity flows (e.g., muddy debrite flows and slumps), most SSDSs are ascribed to rift-related seismicity due to the activity of the adjacent synsedimentary faults when the Dongying Depression underwent quick subsidence during the Eocene. © 2021 Elsevier B.V.
Number of references: 116
Main heading: Deposits
Controlled terms: Deformation - Stratigraphy - Earthquakes - Sediments - Sandstone - Fluidization
Uncontrolled terms: Bohai Bay Basin - Deformation mechanism - East China - Paleogene - Sediment gravity flow - Seismites - Soft-sediment deformation structures - Syn-rift - The dongying depression
Classification code: 481.1 Geology - 482.2 Minerals - 483 Soil Mechanics and Foundations - 484 Seismology - 802.3 Chemical Operations
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117. On ideals of residuated lattices

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Authors: Dong, Yan Yan (1); Wang, Jun Tao (2)
Author affiliation: (1) Beijing Key Laboratory on MCAACI, School of Mathematics and Statistics, Beijing Institute of Technology, Beijing, China; (2) School of Science, Xi'An Shiyou University, Shaanxi, Xi'an, China
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Abstract: In this paper, we first point out some mistakes in [12]. Especially the Theorem 3.9 [12] showed that: Let A be residuated lattice and n; X subE A, then the least ideal containing X can be expressed as: X = {a Element A| a $\leq$ (((x +x2)+x3) xn, xi X, i = 1, 2 , n}. But we present an example to illustrate the ideal generation formula may not hold on residuated lattices. Further we give the correct ideal generation formula on residuated lattices. Moreover, we extend the concepts of annihilators and α–ideals to MTL-algebras and focus on studying the relations between them. Furthermore, we show that the set I# (M) of all α–ideals on a linear MTL-algebra M only contains two trivial α–ideals {0} and M. However, the authors [24] studied the structure of I# (M) in a linear BL-algebra M, which means some results with respect to I# (M) given in [24] are trivial. Unlike that, we investigate the lattice structure of I# (M) on general MTL-algebras. © 2021 - IOS Press. All rights reserved.
Number of references: 24
Main heading: Linearization
Controlled terms: Algebra
Uncontrolled terms: BL-algebra - Lattice structures - MTL-algebras - Residuated lattices
Classification code: 921.1 Algebra
DOI: 10.3233/JIFS-202417
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Funding text: This study was funded by a grant of National Natural Science Foundation of China (11871097, 12071033, 12001423, 61976244, 11961016), Beijing Institute of Technology Science and Technology Innovation Plan Cultivation Project (No. 2021CX01030), the Natural Science Basic Research Plan in Shaanxi Province of China (2020JQ-762, 2021JQ-580, 2021JQ-579) and Natural Science Foundation of Education Committee of Shannxi Province (20JK0626).
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118. Thermodynamics and kinetics of water vapor adsorption onto shale: A case study of the Permian Shanxi Formation, Ordos Basin

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Authors: Dang, Wei (1, 2, 3); Zhang, Jinchuan (4); Wang, Fengqin (1, 2); Li, Pei (4); Shan, Chang'an (1, 2); Wang, Ruijing (1)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Key Laboratory of Tight Oil and Gas Geology of National Petroleum and Chemical Industry, Xi'an Shiyou University, Xi'an; 710065, China; (3) Key Laboratory of Tectonics and Petroleum Resources, Ministry of Education, China University of Geosciences, Wuhan; 430074, China; (4) School of Energy Resources, China University of Geosciences (Beijing), Beijing; 100083, China
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Abstract: Adsorption is one of the key mechanisms for the occurrence of connate water and formation water in shale reservoirs.A characterization of water adsorption onto organic-rich shale is of great theoretical and practical significance to tackling such geological and engineering issues as the micro-distribution of water and gas, the mechanisms of shale gas enrichment and the improvement of shale gas recovery.Shale-water vapor isothermal adsorption experiments were therefore combined with some theoretical adsorption models (7 thermodynamic models and 4 kinetics models) to study the fundamental principles of water vapor adsorption on shale.Results indicate that the adsorption/desorption isotherms are showing the typical Typecurves with hysteresis loops extending to very low relative pressure region, which may be explained by the fact of reluctant dehydration of clay minerals.Two of the models, GAB and Dent, are proven to be the most fitting to the shale-water vapor isotherm curves and reveal a two-stage water molecule adsorption on shale from forming monolayers to multilayers and capillary condensation.With p/p0 less than 0.1, water molecules are mainly adsorbed as monolayer on one site of shale.With p/p0 between 0.1 and 0.8, the site is gradually saturating and more layers start to build upon the first layer, thus forming a secondary adsorption site.With p/p0 greater than 0.8, the first site is almost fully saturated and the adsorption on the secondary site continues in such a rate that capillary condensation of water occurs.Moreover, the negative values of Gibbs free energy change, enthalpy change and entropy change of the adsorption, indicate a spontaneous, exothermic and entropy-reduction process.Thus the double first-order rate model is the most suitable for describing the adsorption process of water vapor on shale.It reveals that the adsorption process can be divided into a surface adsorption dominated by an earlier external diffusion and a pore adsorption dominated by a later internal diffusion, and that the internal diffusion serves to control the adsorption rate of water vapor onto shale. © 2021, OIL & GAS GEOLOGY Editorial Board. All right reserved.
Number of references: 51
Main heading: Free energy
Controlled terms: Gibbs free energy - Monolayers - Gas adsorption - Molecules - Adsorption isotherms - Water vapor - Condensation - Diffusion - Entropy - Curve fitting
Uncontrolled terms: Adsorption/desorption - Capillary condensation - Fundamental principles - Gibbs free energy changes - Isothermal adsorption - Thermodynamic model - Thermodynamics and kinetics - Water vapor adsorption
Classification code: 641.1 Thermodynamics - 802.3 Chemical Operations - 921.6 Numerical Methods - 931.3 Atomic and Molecular Physics
DOI: 10.11743/ogg20210115
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119. Simulation research on microscopic remaining oil distribution in high water cut oilfield (*Open Access*)

Accession number: 20210910005301
Authors: Pan, Shaowei (1); Wang, Zhaoyang (1); Luo, Haining (2)
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Conference name: 2020 6th International Conference on Advances in Energy Resources and Environment Engineering, ICAESEE 2020
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Publisher: IOP Publishing Ltd
Abstract: Most of the oilfields in China have entered the stage of high water cut nowadays, and it is very difficult to enhance oil recovery in these oilfields. In this paper, combined with the image processing technology, the visualization technology of 3D data field and the seepage mechanics theory, a simulation model on microscopic remaining oil distribution has been constructed. After that, the remaining oil distribution of a high water cut oilfield in south China in three different microscopic pore throat networks, namely big pore and coarse throat, medium pore and medium throat and small pore and fine throat, was simulated. Through the simulation results, the conclusions are drawn: compared with the small pore and fine throat network, the development resistance of oil in the big pore and coarse throat network and the medium pore and medium throat network is smaller under the same water-flooding development conditions; compared with the big pore and coarse throat network, the development resistance of oil in the medium pore and medium throat network is larger, which leads to more remaining oil left. The simulation on microscopic remaining oil distribution is of great significance for enhancing oil recovery in high water cut oilfields of China. © Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence.
Number of references: 12
Main heading: Three dimensional computer graphics
Controlled terms: Data visualization - Image processing - Computer system recovery - Oil well flooding - Oil field development
Uncontrolled terms: Enhance oil recoveries - Image processing technology - Remaining oil distribution - Seepage mechanics - Simulation model - Simulation research - Visualization technologies - Water-flooding development
Classification code: 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 723.2 Data Processing and Image Processing - 723.5 Computer Applications
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120. Interfacial Properties of nMOSFETs with Different Al2O3Capping Layer Thickness and TiN Gate Stacks

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Authors: Wang, Danghui (1); Xu, Tianhan (1); Simoen, Eddy (2); Govoreanu, Bogdan (2); Claeys, Cor (3); Zhang, Yang (1)
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Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In this article, the interfacial properties of nMOSFETs with different thickness high-$_{\kappa}$ Al2O3 capping layer on an 8-nm SiO2 and TiN gate stacks have been investigated using electrical measurement and low-frequency noise at room temperature. It is shown that the predominant 1/f noise is governed by the number fluctuations mechanism. It is indicated that: 1) presence of an Al2O3 capping layer increases the noise power spectral density and, hence, the oxide trap density has an influence on the low-field mobility further and 2) effective work-function and the threshold voltage of nMOSFET should be modulated using the high-$_{\kappa}$ Al2O3 capping layers. © 1963-2012 IEEE.
Number of references: 21
Main heading: Threshold voltage
Controlled terms: Electric breakdown - Spectral density - Titanium nitride - Silica - Aluminum oxide - MOSFET devices - Tin - Alumina
Uncontrolled terms: Different thickness - Effective work function - Electrical measurement - Interfacial property - Low-Frequency Noise - Noise power spectral density - Number fluctuations - Oxide trap density
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Numerical data indexing: Size 8.00e-09m
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121. Experimental study on seismic performance of hybrid coupled partially encased composite shear wall

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Authors: Shi, Yun (1); Zhou, Qiaoling (2); Su, Mingzhou (2); Jiang, Lu (3); Yang, Yukun (3); Zhang, Lili (3); Guan, Lingyu (2)
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Publisher: Chinese Society of Civil Engineering
Abstract: In order to meet the requirements of seismic performance and assembly performance of high-rise buildings, a hybrid coupled partially encased composite shear wall is proposed.Low cyclic loading test was conducted on a 3-story symmetrical double-leg with a scale of 2/3, by which the whole process of the hybrid coupled partially encased composite shear wall under cyclic loading was observed, and the hysteretic performance, bearing capacity, ductility, stiffness degradation, energy dissipation capacity and rotation capacity of coupling beam were analyzed.The results showed that the hysteretic curve of the hybrid coupled partially encased composite shear wall was full and stable, and there was no obvious pinch phenomenon.The average ductility coefficient of the forward and backward displacement was 3.65, which showed good seismic performance and cooperative working ability.The damage of shear steel coupling beam mainly concentrated in the web of coupling beam, and its ultimate plastic angle can reach 0.05 rad.The grid flange in the middle of wall limb could limit the development of shear crack at the bottom of wall limb.The main failure mode of shear wall was bending failure.The steel coupling beam and shear wall exhibited good ductility and energy dissipation capacity.The ultimate displacement angle between stories was 1/45, which exceeded the code limit under rare earthquakes.The steel coupling beam and the PEC shear wall both showed excellent ductility and energy dissipation capacity.According to the specimen designed with the coupling ratio of 45% when the whole structure yields, the development of plastic hinge conforms to the law of "strong-wall-limb and weak-coupling-beam".The quasi-static analysis results by using the finite element software ABAQUS agree well with the test ones. © 2021, Editorial Office of China Civil Engineering Journal. All right reserved.
Number of references: 16
Main heading: Stiffness
Controlled terms: Energy dissipation - Rare earths - Seismology - Seismic waves - Static analysis - ABAQUS - Hysteresis - Ductility - Shear walls - Cyclic loads - Tall buildings - Software testing
Uncontrolled terms: Co-operative working - Ductility coefficient - Energy dissipation capacities - Forward-and-backward - Hysteretic performance - Partially encased composites - Quasi static analysis - Stiffness degradation
Classification code: 402 Buildings and Towers - 408.1 Structural Design, General - 484 Seismology - 484.1 Earthquake Measurements and Analysis - 484.3 Earthquake Resistance - 525.4 Energy Losses (industrial and residential) - 723.5 Computer Applications - 804.2 Inorganic Compounds - 921 Mathematics - 951 Materials Science - 961 Systems Science
Numerical data indexing: Percentage 4.50e+01%
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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122. Design of power monitoring system for 33MW DC submerged arc furnace based on PLC

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Authors: Cheng, Ying (1); Su, Chang (2); Li, Hong (1)
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Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360

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Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This paper introduces a monitoring system of 33MW submerged arc furnace DC energy saving power supply equipment. The energy saving equipment is equivalent to 36 pulse waves at the side of high voltage grid when running. Three sets of independent 12-pulse thyristor rectifier links are used to supply DC power to 33MW submerged arc furnace through six electrodes. S7-200 Smart PLC and WinCC monitoring configuration software are used to realize the design of the monitoring system, and the monitoring system uses industrial Ethernet and point-to-point interface (PPI) communication protocol to achieve the precise and rapid control of the power supply system of 33MW mining furnace, realizing the digitization and intelligence. The field debugging and application results show that, the monitoring system has a good man-machine interface, high degree of automation, and can run efficiently, stably and safely. © 2021 IEEE.
Number of references: 9
Main heading: Energy conservation
Controlled terms: Electric power supplies to apparatus - Program debugging - Monitoring - Low power electronics - Furnaces - HVDC power transmission - Surge protection - Timing circuits - Electric rectifiers
Uncontrolled terms: Configuration software - Degree of automation - Industrial Ethernets - Man machine interface - Monitoring system - Power supply equipment - Submerged arc furnace - Thyristor rectifier
Classification code: 525.2 Energy Conservation - 704 Electric Components and Equipment - 706.1.1 Electric Power Transmission - 713.4 Pulse Circuits - 723.1 Computer Programming - 914.1 Accidents and Accident Prevention
Numerical data indexing: Power 3.30e+07W
DOI: 10.1109/ICMSP53480.2021.9513331
Compendex references: YES
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123. Research on Optimization of GWO-BP Model for Cloud Server Load Prediction (*Open Access*)

Accession number: 20214911285724
Authors: Hou, Ke (1); Guo, Mingcheng (1); Li, Xinhao (1); Zhang, He (2)
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Corresponding author: Hou, Ke(kehou@188.com)
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Pages: 162581-162589
Language: English
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Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: To improve the accuracy of cloud server resource load prediction, particle swarm optimization (PSO) algorithm, gray wolf optimization (GWO) algorithm and BP neural network are studied in-depth and applied. Firstly, the PSO algorithm is introduced to optimize the location update method in the search process of gray wolf. Secondly, the convex function is introduced to improve the linear convergence of the traditional GWO algorithm. Then the optimized GWO algorithm is used to further improve the assignment of weights and thresholds in the traditional BP neural network model, to construct a multi-stage optimized cloud server load prediction model, referred to as PSO-GWO-BP prediction model. Finally, the performance of the PSO-GWO-BP prediction model is verified by comparison experiments. © 2021 IEEE.
Number of references: 37
Main heading: Forecasting
Controlled terms: Particle swarm optimization (PSO) - Functions - Cloud computing - Radial basis function networks
Uncontrolled terms: BP neural networks - Cloud servers - Gray wolf optimizer - Gray wolves - Load predictions - Optimisations - Optimization algorithms - Optimizers - Prediction modelling - Server loads
Classification code: 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications - 921 Mathematics - 921.5 Optimization Techniques

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124. Exploring Coevolution of Emotional Contagion and Behavior for Microblog Sentiment Analysis: A Deep Learning Architecture (*Open Access*)

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Authors: Zhang, Qi (1); Zhang, Zufan (1); Yang, Maobin (1); Zhu, Lianxiang (2)
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Corresponding author: Zhang, Zufan(zhangzf@cqupt.edu.cn)
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Publication year: 2021
Article number: 6630811
Language: English
ISSN: 10762787
E-ISSN: 10990526
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: This paper aims to explore coevolution of emotional contagion and behavior for microblog sentiment analysis. Accordingly, a deep learning architecture (denoted as MSA-UITC) is proposed for the target microblog. Firstly, the coevolution of emotional contagion and behavior is described by the tie strength between microblogs, that is, with the spread of emotional contagion, user behavior such as emotional expression will be affected. Then, based on user interaction and the correlation with target microblog, the Hawkes process is adopted to quantify the tie strength between microblogs so as to build the corresponding weighted network. Secondly, in the weighted network, the Deepwalk algorithm is used to build the sequence representation of microblogs which are similar to the target microblog. Next, a CNN-BiLSTM-Attention network (the convolutional neural network and bidirectional long short-term memory network with a multihead attention mechanism) is designed to analyze the sentiment analysis of target and similar microblogs. Finally, the experimental results on two real Twitter datasets demonstrate that the proposed MSA-UITC has advanced performance compared with the existing state-of-the-art methods. © 2021 Qi Zhang et al.
Number of references: 46
Main heading: Sentiment analysis
Controlled terms: Convolutional neural networks - Network architecture - Behavioral research - Deep learning
Uncontrolled terms: Attention mechanisms - Emotional expressions - Learning architectures - Short term memory - State-of-the-art methods - User behaviors - User interaction - Weighted networks
Classification code: 461.4 Ergonomics and Human Factors Engineering - 723.2 Data Processing and Image Processing - 971 Social Sciences
DOI: 10.1155/2021/6630811
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125. Effects of organic molecule adsorption and substrate on electronic structure of germanene (*Open Access*)

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Title of translation:
Authors: Xiao, Mei-Xia (1); Leng, Hao (1); Song, Hai-Yang (1); Wang, Lei (1); Yao, Ting-Zhen (1); He, Cheng (2)
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Corresponding authors: Xiao, Mei-Xia(mxxiao@xsyu.edu.cn); He, Cheng(hecheng@xjtu.edu.cn)
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Abstract: The development potential of germanene-based integrated electronics originates from its high carrier mobility and compatibility with the existing silicon-based and germanium-based semiconductor industry. However, the small band gap energy band (Dirac point) of germanene greatly impedes its application. Thus, it is necessary to open a sizeable band gap without reducing the carrier mobility for the application in logic circuits. In this study, the effects of organic molecule (benzene or hexafluorobenzene) adsorption and substrate on the atomic structures and electronic properties of germanene under an external electric field are investigated by using density functional theory calculations with van der Waals correction. For benzene/germanene and hexafluorobenzene/germanene systems, four different adsorption sites are considered, with the center of the organic molecules lying directly atop the upper or lower Ge atoms of germanene, in the Ge-Ge bridge center, and on the central hollow ring. Meanwhile, different molecular orientations at each adsorption site are also considered. Thus, there are eight high-symmetry adsorption configurations of the systems, respectively. According to the adsorption energy, we can determine the most stable atomic structures of the above systems. The results show that the organic molecule adsorption can induce the larger buckling height in germanene. Both the adsorption energy and interlayer distance indicate that there is no chemical bond between the organic molecules and germanene. Mulliken population analysis shows that a charge redistribution in the two sublattices in germanene exists since benzene is an electron donor molecule and hexafluorobenzene is an electron acceptor molecule. As a result, the benzene/germanene system exhibits a relatively large band gap (0.036 eV), while hexafluorobenzene/germanene system displays a small band gap (0.005 eV). Under external electric field, germanene with organic molecule adsorption can exhibit a wide range of linear tunable band gaps, which is merely determined by the strength of electric field regardless of its direction. The charge transfer among organic molecules and two sublattices in germanene gradually rises with the increasing the strength of electric field, resulting in the electron density around the sublattices in germanene unequally distributed. Thus, according to the tight-binding model, a larger band gap at the K-point is opened. When germanane (fully hydrogenated germanene HGeH) substrate is applied, the band gaps further widen, where the band gap of benzene/ germanene/germanane system can increase to 0.152 eV, and that of hexafluorobenzene/germanene/germanane system can reach 0.105 eV. The sizable band gap in germanene is created due to the symmetry of two sublattices in germanene destroyed by the dual effects of organic molecule adsorption and substrate. Note that both of organic molecules and substrate are found to non-covalently functionalize the germanene. As the strength of the negative electric field increases, the band gaps can be further modulated effectively. Surprisingly, the band gaps of the above systems can be closed, and reopened under a critical electric field. These features are attributed to the build-in electric field due to the interlayer charge transfer of the systems, which breaks the equivalence between the two sublattices of germanene. More importantly, the high carrier mobility in germanene is still retained to a large extent. These results provide effective and reversible routes to engineering the band gap of germanene for the applications of germanene to field-effect transistor and other nanoelectronic devices. © 2021 Chinese Physical Society.

Number of references: 50
Main heading: Electronic structure
Controlled terms: Crystal atomic structure - Electronic properties - Substrates - Germanium compounds - Molecules - Adsorption - Atoms - Van der Waals forces - Benzene - Carrier mobility - Energy gap - Field effect transistors - Germanium - Charge transfer - Computer circuits - Calculations - Electric fields
Uncontrolled terms: Critical electric field - Electron-donor molecules - External electric field - Mulliken population analysis - Nanoelectronic devices - Organic molecule adsorption - Semiconductor industry - Van der Waals correction
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 701.1 Electricity: Basic Concepts and Phenomena - 712.1 Semiconducting Materials - 714.2 Semiconductor Devices and Integrated Circuits - 721.3 Computer Circuits - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.1 Organic Compounds - 921 Mathematics - 931.3 Atomic and Molecular Physics - 933.1.1 Crystal Lattice
Numerical data indexing: Electron_Volt 1.05e-01eV, Electron_Volt 1.52e-01eV, Electron_Volt 3.60e-02eV, Electron_Volt 5.00e-03eV
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Funding text: Project supported by the Young Scientists Fund of the National Natural Science Foundation of China (Grant No. 51801155) and the Provincial Superiority Discipline of Materials Science and Engineering of Xi'an Shiyou University, China (Grant No. YS37020203)* Project supported by the Young Scientists Fund of the National Natural Science Foundation of China (Grant No. 51801155) and the Provincial Superiority Discipline of Materials Science and Engineering of Xi'an Shiyou University, China (Grant No. YS37020203). † Corresponding author. E-mail: mxxiao@xsyu.edu.cn ‡ Corresponding author. E-mail: hecheng@xjtu.edu.cn
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126. Three-way decision on information tables

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Abstract: The model of three-way decision on two universes generalizes various two-universe models of rough sets, and it is in fact defined on 0–1 tables, i.e. binary information tables. This paper generalizes the model of three-way decision from 0–1 tables to general information tables. The framework of three-way decision on general information tables is presented and the connection of existing related models is investigated. In our models, every element in the set of objects is assigned to a value and we can construct a tri-partition of the object set according to a pair of thresholds. We present a fundamental result of the models, which induces two concepts: the fundamental sequence and pair. On the one hand, the fundamental result shows that there exist finitely many pairs of thresholds. That is, we need only to consider the case of finitely many tri-partitions. On the other hand, it describes how the positive region varies based on thresholds and induces a concept of positive region tower. Finally, we evaluate these finite tri-partitions by the weighted entropy, which is a new measure defined as a variant of information entropy. An optimal tri-partition can be obtained according to weighted entropies of the finite tri-partitions. © 2020
Number of references: 46

Main heading: Rough set theory
Controlled terms: Decision tables
Uncontrolled terms: Binary information - General information - Information entropy - Information table - Positive region
Classification code: 723.1 Computer Programming - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
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127. Tunable band gaps and high carrier mobilities in stanene by small organic molecule adsorption under external electric fields

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Authors: Xiao, Mei-Xia (1); Shao, Xiao (1); Song, Hai-Yang (1); Li, Zhao (1); An, Min-Rong (1); He, Cheng (2)
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Publisher: Royal Society of Chemistry
Abstract: The effects of small organic molecule (SOM) adsorption with benzene (C6H6), hexafluorobenzene (C6F6), and p-difluorobenzene (C6H4F2) on the electronic properties of stanene under external electric fields are investigated through first-principles calculations. Different adsorption sites and molecular orientations are considered to determine the most stable configurations of small organic molecule (SOM) adsorption on the surface of stanene. The results show that the internal electric field caused by the adsorption of small organic molecules destroys the symmetry of the two sublattices of stanene in C6H6/stanene, C6F6/stanene and C6H4F2/stanene systems with the most stable configurations, opening the band gaps of stanene with 39.5, 18.9 and 14.5 meV, respectively. Under an external electric field, a wide range of linearly tunable and sizable direct band gaps (31.6-420.1 meV for the C6H6/stanene system, 14.8-587.2 meV for the C6F6/stanene system and 14.5-490.2 meV for the C6H4F2/stanene system) are merely determined by the strength of the composite electric field despite its direction. The mechanism of charge transfer between stanene and organic molecules under an external electric field can be revealed using an equivalent capacitor model to explain the tunable charge transfer. More importantly, the high carrier mobility of the stable SOM/stanene systems under an external electric field is largely retained due to the weak interactions at the interface. These results indicate that the electronic properties of stanene can be effectively modulated by the surface adsorption of organic molecules under an external electric field, providing effective and reversible routes to enhance the performance of stanene for novel electronic devices in the future. © the Owner Societies.
Number of references: 67
Main heading: Electronic properties
Controlled terms: Calculations - Carrier mobility - Molecules - Adsorption - Electric fields - Charge transfer - Energy gap
Uncontrolled terms: Equivalent capacitors - External electric field - First-principles calculation - High carrier mobility - Internal electric fields - Small organic molecules - Stable Configuration - Surface adsorption

Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 712.1 Semiconducting Materials - 802.2 Chemical Reactions - 802.3 Chemical Operations - 921 Mathematics - 931.3 Atomic and Molecular Physics
Numerical data indexing: Electron_Volt 1.45e-02eV, Electron_Volt 1.45e-02eV to 4.90e-01eV, Electron_Volt 1.48e-02eV to 5.87e-01eV, Electron_Volt 1.89e-02eV, Electron_Volt 3.16e-02eV to 4.20e-01eV
DOI: 10.1039/d1cp01582f
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128. A Novel Emerging Topic Identification and Evolution Discovery Method on Time-Evolving and Heterogeneous Online Social Networks (*Open Access*)

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Authors: Xu, Xiaoyan (1); Lv, Wei (1); Zhang, Beibei (2); Zhou, Shuaipeng (3); Wei, Wei (2); Li, Yusen (1)
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Corresponding author: Xu, Xiaoyan(xyxu@xsyu.edu.cn)
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Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: With the fast development of web 2.0, information generation and propagation among online users become deeply interweaved. How to effectively and immediately discover the new emerging topic and further how to uncover its evolution law are still wide open and urgently needed by both research and practical fields. This paper proposed a novel early emerging topic detection and its evolution law identification framework based on dynamic community detection method on time-evolving and scalable heterogeneous social networks. The framework is composed of three major steps. Firstly, a time-evolving and scalable complex network denoted as KeyGraph is built up by deeply analyzing the text features of all kinds of data crawled from heterogeneous online social network platforms; secondly, a novel dynamic community detection method is proposed by which the new emerging topic is detected on the modeled time-evolving and scalable KeyGraph network; thirdly, a unified directional topic propagation network modeled by a great number of short texts including microblogs and news titles is set up, and the topic evolution law of the previously detected early emerging topic is identified by fully utilizing local network variations and modularity optimization of the "time-evolving"and directional topic propagation network. Our method is proved to yield preferable results on both a huge amount of computer-generated test data and a great amount of real online network data crawled from mainstream heterogeneous social networks. © 2021 Xiaoyan Xu et al.
Number of references: 41
Main heading: Social networking (online)
Controlled terms: Population dynamics - Complex networks
Uncontrolled terms: Computer generated - Dynamic communities - Emerging topic detections - Emerging topics - Information generation - Local networks - On-line network - On-line social networks
Classification code: 722 Computer Systems and Equipment - 723 Computer Software, Data Handling and Applications - 971 Social Sciences
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Open Access type(s): All Open Access, Gold

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129. Research on vibration sensing characteristics of FBG packaged with composites

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Authors: Feng, Dequan (1, 2); Zhou, Weiquan (1); Luo, Xiaodong (1); Yang, Li (1); Sun, Shaoyang (1)
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Publisher: SPIE
Abstract: Fiber Bragg gratings (FBGs) have advantages of easy multiplexing, corrosion resistance, and anti-electromagnetic interference. FBG packaging is an important factor in optical fiber sensing, and the substrate material for packaging FBG has a great influence on sensing performance of FBG. In this paper, a FBG is packaged with an equal strength cantilever beam made of composite material. The principle of vibration sensing of the FBG sensor is theoretical analyzed. Then, experiments are performed to test the vibration sensing performance. The experimental results show that the composite material can be used to package FBG. The FBG sensor has a good response to the external vibration after package. The resonant frequency of the FBG sensor is 115Hz, and the acceleration sensitivity is almost 30pm/g in the range of 20#70Hz. © 2021 COPYRIGHT SPIE.
Number of references: 9
Main heading: Fiber Bragg gratings
Controlled terms: Corrosion resistance - Natural frequencies - Electromagnetic pulse - Composite materials - Electric sensing devices - Vibration analysis - Packaging
Uncontrolled terms: Anti-electromagnetic - Composites material - Fiber bragg grating - Fiber Bragg Grating Sensors - Optical fiber sensing - Package - Sensing characteristics - Sensing performance - Substrate material - Vibration sensing
Classification code: 539.1 Metals Corrosion - 694.1 Packaging, General - 701 Electricity and Magnetism - 732 Control Devices - 951 Materials Science
Numerical data indexing: Frequency 1.15E+02Hz, Frequency 7.00E+01Hz, Size 3.00E-11m
DOI: 10.1117/12.2606121
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130. Thermophilic co-digestion of blackwater and organic kitchen waste: Impacts of granular activated carbon and different mixing ratios

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Authors: Zhang, Qianyi (1); Li, Ran (1, 2); Guo, Bing (1); Zhang, Lei (1); Liu, Yang (1)
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Publisher: Elsevier Ltd
Abstract: Biogas (methane) as a source of renewable energy, was produced in the anaerobic co-digestion of blackwater (BW, municipal toilet wastewater) and organic kitchen waste (KW). The impact on methane production of various BW to KW mixing ratios, with and without the addition of granular activated carbon (GAC), were studied under thermophilic (55 °C) temperatures. GAC is reported to enhance methane production in such digestions through direct interspecies electron transfer. The results showed that the co-digestion of BW and KW under the 1:2 VS ratio significantly improved the biomethane potential (BMP). In the absence of GAC, an optimal BW:KW ratio was found to be 1:2, achieving a BMP of 0.76 g CH4-COD/g feed-COD. With GAC addition, the BMP increased to 0.81 g CH4-COD/g feed-COD, the lag phase in the digestion was significantly reduced, and the methane production rate increased. Microbial communities in the BW-KW anaerobic digestion were analyzed with and without the addition of GAC. Methanothermobacter and Methanosarcina were predominant archaea in BW-KW digests, with and without GAC amendment, while a third methanogen, Methanomassiliicoccus, was enriched with the addition of GAC to the digest. Further, through SEM image, the enrichment of pili-like stucture was observed in GAC surface. © 2021 Elsevier Ltd
Number of references: 50
Main heading: Anaerobic digestion
Controlled terms: Granular materials - Methanogens - Biogas - Activated carbon - Kitchens - Methane - Mixing - Organic carbon
Uncontrolled terms: Biomethane - Blackwater - Codigestion - Granular activated carbons - Kitchen waste - Methane production - Mixing ratios - Organic kitchen waste - Organics - Thermophilics
Classification code: 461.9 Biology - 522 Gas Fuels - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.1 Organic Compounds - 821.5 Agricultural Wastes - 951 Materials Science
Numerical data indexing: Mass 7.60E-04kg, Mass 8.10E-04kg, Temperature 3.28E+02K
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131. Optical Fiber Grating Geophone Assisted with a Hollow Triangle Beam

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Authors: Wang, Zilin (1); Fan, Wei (1); Gao, Hong (1); Qiao, Xueguang (2)
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Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to improve the beam structure of the fiber Bragg grating (FBG) geophone's sensitivity and horizontal anti-interference ability, a hollow triangle beam FBG geophone is proposed and demonstrated, analysing the acceleration geophone detection theory, deducing its natural frequency and transverse anti-interference ability, through COMSOL software to build the geophone model, then through MATLAB optimize the structural parameters of the geophone, Finally, the parameters which can not only satisfy the practical application of geophone but also improve the performance of geophone are obtained. The geophone object is made through integrated processing, and experiments are carried out. The experimental results show that the flat area of the geophone is 0.6 Hz50.0 Hz, and the natural frequency is 61.0 Hz. The measured acceleration sensitivity is 120.1 pm/g, which has a good linear relationship with the vibration signal frequency. The hollow triangular beam geophone has a good transverse anti-interference ability due to its mechanical structure. The lateral interference degree in X and Y direction is 2.8 % and 4.6 % respectively, This will have important research significance in the field of seismic wave detection in oil and gas exploration. © 2001-2012 IEEE.
Number of references: 20
Main heading: Application programs
Controlled terms: Natural frequencies - Fiber Bragg gratings - Petroleum prospecting - MATLAB
Uncontrolled terms: Anti-interference - Beam structures - Detection theory - Fiber bragg grating geophone - Flat area - Lateral anti-interference - Optical fiber gratings - Performance - Structural parameter - Vibration
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 723 Computer Software, Data Handling and Applications - 723.5 Computer Applications - 921 Mathematics
Numerical data indexing: Frequency 5.00E+01Hz, Frequency 6.00E-01Hz, Frequency 6.10E+01Hz, Percentage 2.80E+00%, Percentage 4.60E+00%, Size 1.201E-10m
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132. Nickel-Based Single Crystal Superalloys with Different Rhenium Contents

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Authors: Feng, Wenhao (1); Chang, Jianxiu (1); Zhu, Shidong (1, 2)
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Corresponding author: Zhu, Shidong(zhusdxt@126.com)
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Publisher: Editorial Office of Chinese Journal of Rare Metals
Abstract: Nickel-based single crystal superalloys were widely used in modern aero-engine turbines and large industrial gas turbins due to their excellent mechanical properties and outstanding oxidation and hot corrosion resistance. The continuous demand of the gas turbine engine manufacturers for an increasing turbine inlet temperature had pushed the alloy designers to develop superalloys with higher mechanical strength. Re was a crucial element in the history of single crystal superalloy development. In this article, the development history of nickel-based single crystal superalloys was briefly described, the role of Re in nickel-based single crystal superalloys, including its directly and indirectly effects on the microstructure, creep property, high temperature oxidation and hot corrosion behavior were reviewed. It was found that Re addition gathered mainly in the γ matrix and its solubility in the #' phase was very low, in spite of that there was still controversy on Re distribution in γ: in the form of Re-clusters, or in the γ/#' interface, or distributed uniformly in γ. The addition of Re had two main influences on the alloy microstructure. On the one hand, Re addition affected the growth rate and morphology evolution of #' phase at high temperature. The addition of a certain amount of Re delayed the coarsening of #' and maintained the cubic morphology of them. On the other hand, Re addition changed the distribution ratio of other elements in γ phase and #' phase. Re promoted the distribution of Al into the #' phase, and the distribution of Cr, Ta and W into the γ matrix. The altered distribution ratio also affected the morphology of #'. Re addition significantly improved the creep performance of single crystal superalloys. The size, shape and morphology of #' phase during long-term service were the main factors that influenced the mechanical property of nickel-based superalloys. The following mechanisms were put forward to explaining the improved creep performance by Re addition: (1) distribution of Re in γ phase caused solid solution strengthening of the substrate, (2) Re changed the γ/#' lattice misfit to more negative value, (3) large atomic radius of Re lowered down the diffusion rate of other elements, retarded the dislocation motion and coarsening of #', (4) Re clusters acted as obstacles of dislocation movement and put off the #' rafting, (5) Re segregation strengthened the γ/#' interface. The interfaces decorated with higher Re concentration had higher density of dislocation network and could effectively prevent the shearing of the dislocations. The mechanisms, however, still remained controversial. For coatings, the oxidation rate constant was reduced and the oxidation resistance was significantly improved with an appropriate amount of Re addition. The possible mechanisms were reduced depletion rate of β–NiAl, improved stability of α–Cr and subsequent increased adhesion between the protective α–Al2O3 scale and the substrate, and enhanced transformation rate from θ–Al2O3 to α–Al2O3. For bare superalloys, beneficial and deteriorated effects of Re addition were both reported. The deteriorated effect was supported by observation of discontinuous or porous α–Al2O3 scale caused by aggravated micro-segregation of Al elements or formation of volatile Re2O7 raised by Re addition. The opposite results, however, were reported by other researchers. It was probably because Re could slow down the diffusion rate of Cr in the alloy, promote the formation of continuous α–Al2O3 scale, and inhibit the formation of nitrides in the alloy. The Cr2O3 scale formed on alloys with high Re content was denser than that on Re-free alloys. Moreover, Re promoted the formation of TiO2 and NiTiO3. The reason was probably attributed to the increased activities of elements Cr and Ti caused by the Re addition, which allowed more Cr to diffuse outward to heal the cracks in the protective scale. However, the distribution of Re in the alloys and its mechanisms on the properties still requires in-depth research. The effect of Re addition, the optimization of Re alloying, the interaction of Re and other elements and the development of new Re-bearing alloys were still the direction of numerous researchers. Computer-assisted method and high-throughput method were prospected to provide more effective ways for single crystal superalloy research and development. © Editorial Office of Chinese Journal of Rare Metals. All right reserved.
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Main heading: Superalloys
Controlled terms: High temperature corrosion - Rhenium - Corrosive effects - Morphology - Corrosion resistance - Creep - Aircraft engines - Coarsening - Gas turbines - Nickel - Nickel alloys - Thermooxidation - Mechanisms - Single crystals
Uncontrolled terms: Computer-assisted methods - High-throughput method - Nickel- based superalloys - Oxidation and hot corrosions - Research and development - Single crystal superalloys - Solid solution strengthening - Turbine inlet temperature
Classification code: 531 Metallurgy and Metallography - 539.1 Metals Corrosion - 548.1 Nickel - 548.2 Nickel Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 601.3 Mechanisms - 612.3 Gas Turbines and Engines - 653.1 Aircraft Engines, General - 802.2 Chemical Reactions - 931.2 Physical Properties of Gases, Liquids and Solids - 933.1 Crystalline Solids - 951 Materials Science
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133. Design of array electrode sensor for buried oil tank ECT system

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Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The issue of environmental protection has received constant attention from the state, and the problem of leakage of buried oil tanks has also been paid attention. This paper is based on the ECT method to detect the leakage of buried oil tanks, analyzing and designing array sensors that are more suitable for this application, and proposing different electrode coverage and different numbers of array ring sensors. Based on COMSOL software, three-dimensional finite element models of ECT sensors under six conditions were constructed, and their capacitance and sensitivity were calculated. Firstly, the influence of capacitance sensor under different electrode coverage on sensitivity nonuniformity P and capacitance dynamic range M is analyzed; then, the influence of capacitance sensor under different electrode number on sensitivity non-uniformity P and capacitance dynamic range M is analyzed. Finally, comparing the values of P and M, conclusion can be obtained: the array sensor is the best when the electrode coverage rate is 1/2 and the number of electrodes is 4. © 2021 IEEE.
Number of references: 12
Main heading: Oil tanks
Controlled terms: Electrodes - Three dimensional computer graphics - Capacitance
Uncontrolled terms: Array sensors - Array-electrode - Capacitance sensors - Coverage rate - Electrode number - Non-uniformities - Nonuniformity - Three dimensional finite element model
Classification code: 523 Liquid Fuels - 619.2 Tanks - 701.1 Electricity: Basic Concepts and Phenomena - 723.2 Data Processing and Image Processing - 723.5 Computer Applications
DOI: 10.1109/ICMSP53480.2021.9513407
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134. Effects of boron doping on the fabrication of dense 6H-SiC ceramics by high-temperature physical vapor transport (*Open Access*)

Accession number: 20214511132233
Authors: Liu, B.B. (1); Huang, J. (2); Yang, J.F. (1)
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Abstract: In this paper, boron-doped dense 6H-SiC ceramics was fabricated by the high-temperature physical vapor transport (HTPVT) method. The effect of B doping on the crystal structure stability of 6H-SiC was investigated based on density functional theory (DFT). The results show that B doping can be realized even under thermodynamical equilibrium conditions. Nevertheless, it is found that the B doping effects on the (0001) of Si-plane and (000-1) of C-plane are significantly different. The doping experiments demonstrated that B can observably change the crystal growth morphology, leading to the formation of elongated 6H-SiC crystals. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 29
Main heading: Silicon carbide
Controlled terms: Fabrication - Boron carbide - Density functional theory - Boron - Silicon - Doping (additives) - Crystal structure
Uncontrolled terms: B-doping - Boron-doped - Boron-doping - Crystals structures - Density-functional-theory - Highest temperature - Physical vapor transport - SiC ceramics - Structure stability - Vapor transport methods
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 804.2 Inorganic Compounds - 812.1 Ceramics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 933.1.1 Crystal Lattice
Numerical data indexing: Inductance 6.00E+00H
DOI: 10.1088/1742-6596/2045/1/012001
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135. Application Research of submersible diaphragm pump based on nonmetal coiled tubing

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Authors: Ji, Xiaoke (1); Li, Mao (1); Zhou, Wangming (1); Liu, Yazhou (1); Liang, Na (1); Xu, Xiangqian (2); Ding, Xueguang (3)
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Conference location: Xi'an, China
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Abstract: Although beam pumping unit is widely used, it has high energy consumption and is gradually replaced by new energy-saving equipment, such as submersible diaphragm pump. Submersible diaphragm pump has been used in oil production system because of its unique diaphragm structure and high pump efficiency, and has achieved good application effect. At the same time, some engineering application problems have also arisen, such as frequent cable damage, wax deposition or corrosion of oil pipe, and difficult monitoring of pump working condition. In order to solve these problems, the application of submersible diaphragm pump system based on non-metallic coiled tubing is studied. The system consists of non-metallic coiled tubing, submersible diaphragm pump, intelligent control unit and wellhead Christmas tree. In the application test of oil production engineering, the process data are compared with the conventional beam pumping unit, and the results show that the power consumption is more than 50% less than that of the conventional beam pumping unit. The application test shows that the system is easy to realize remote monitoring of oil wells and intelligent adjustment of process parameters, and is conducive to unattended well site, which has a good application prospect. © 2021 IEEE.
Number of references: 8
Main heading: Energy utilization
Controlled terms: Coiled tubing - Submersible motors - Submersible pumps - Intelligent control - Submersibles - Energy conservation - Oil wells
Uncontrolled terms: Application effect - Application prospect - Application research - Engineering applications - High energy consumption - Intelligent control unit - Process parameters - Remote monitoring
Classification code: 512.1.1 Oil Fields - 525.2 Energy Conservation - 525.3 Energy Utilization - 618.2 Pumps - 619.1 Pipe, Piping and Pipelines - 674.1 Small Marine Craft - 705.3 Electric Motors - 723.4.1 Expert Systems - 731.1 Control Systems
Numerical data indexing: Percentage 5.00e+01%
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136. Horizontal tectonic stress as a cause of overpressure in the southern margin of the Junggar Basin, northwest China

Accession number: 20212010359444
Authors: Zhang, Fengqi (1, 2); Lu, Xuesong (3); Botterill, Scott (4); Gingras, Murray (4); Zhuo, Qingong (3); Zhong, Hongli (5)
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Abstract: Overpressure can be widely observed in the Jurassic, Cretaceous and Paleogene reservoirs in the southern margin of the Junggar Basin, northwest China. The study region was subjected to intense tectonic stress from the neighbouring North Tianshan Mountains since the Miocene. However, the causes of tectonic stress-induced overpressure are still poorly understood. In this study, we considered the plots of sonic velocity against density and vertical effective stress and applied numerical simulations and geological analysis to determine the origin of overpressure with respect to mudstone and sandstone in the area under study by investigating the compaction of mudstone and analysing the overpressure distribution. Our results indicate that the most overpressured mudstone in the second and third structural belts and the east of the Sikeshu Sag exhibits abnormally high porosity, which is obvious from the regional seal mudstone of the Paleogene Anjihaihe and Lower Cretaceous formations. The overpressure in these mudstones can be mainly attributed to the increase in vertical stress and horizontal tectonic stress (HTS). The current overpressures in the reservoir sandstone of the second and third structural belts as well as towards the east of the Sikeshu Sag are mainly induced by HTS, overpressure transfer and increase in vertical stress. The contribution of the overpressure associated with the generation of HTS to the total overpressure differs in different belts. This contribution ranges from 28.5% to 69.2%, 21.2%–46.2% and 16.3%–34.8% in the second, the third structural belts and the east of the Sikeshu Sag, respectively. Thus, HTS can be the primary contributor to the reservoir overpressure in many zones in the area under study. © 2021 Elsevier B.V.
Number of references: 53
Main heading: Compaction
Controlled terms: Sandstone - Tectonics - Landforms
Uncontrolled terms: Horizontal tectonic stress - Junggar Basin - NorthWest China - Over-pressures - Overpressure transfer - Paleogene - Southern margin of the junggar basin - Structural belt - Tectonics stress - Vertical stress
Classification code: 481.1 Geology - 482.2 Minerals
Numerical data indexing: Percentage 1.63E+01%, Percentage 2.12E+01%, Percentage 2.85E+01% to 6.92E+01%, Percentage 3.48E+01%, Percentage 4.62E+01%
DOI: 10.1016/j.petrol.2021.108861
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137. Effects of external electric field on adsorption behavior of organic molecules on stanene: Highly sensitive sensor devices

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Authors: Xiao, Meixia (1); Zhang, Bing (1); Song, Haiyang (1); Lv, Ying (1); Xiao, Beibei (2)
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Publisher: Elsevier Ltd
Abstract: Motivated by the recent advances in stanene based devices for potential application such as superior gas sensors and electronic devices, we systematically investigated the structural configurations, adsorption energies and charge transfer of organic molecules (OM) on stanene sensors using first-principles calculations. The results show that aniline (C6H7N) and chlorobenzene (C6H5Cl) act as charge acceptors and are chemisorbed on stanene with sizable adsorption energies for the most stable OM/stanene systems. In particular, C6H7N/stanene and C6H5Cl/stanene systems can open the band gaps with 114.3 and 5.0 meV, respectively. Moreover, adsorption energies, charge transfer and band gaps of OM/stanene systems under external electric field can change dramatically, which indicates that external factors on stanene are highly preferred. Our results provide a theoretical basis for the application of stanene in highly sensitive sensor devices. © 2021
Number of references: 49
Main heading: Electric fields
Controlled terms: Chlorine compounds - Energy gap - Adsorption - Calculations - Charge transfer - Molecules - Aniline
Uncontrolled terms: Adsorption behavior - Adsorption energies - Electronic device - External electric field - First-principles calculation - Organic molecules - Sensitive sensors - Structural configurations
Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.1 Organic Compounds - 921 Mathematics - 931.3 Atomic and Molecular Physics
Numerical data indexing: Electron_Volt 1.14e-01eV, Electron_Volt 5.00e-03eV
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138. Back-propagation suppression study based on intake configuration optimization for an air-breathing pulse detonation engine

Accession number: 20213510828798
Authors: Wang, Zhiwu (1); Wang, Yafei (1); Huang, Jingjing (2); Qin, Weifeng (1); Wei, Lisi (1); Liu, Zhi (1); Peng, Changxin (3)

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Language: English
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Publisher: Elsevier Masson s.r.l.
Abstract: In order to reduce the back-propagation of an air-breathing pulse detonation engine efficiently, a suppression method based on the optimization of the intake configuration with wedge-shaped angle and blockage ratio was proposed and studied in this paper. The 2-D numerical simulation based on propane/air combustible mixture was carried out to study the configuration, wedge-shaped angle and the blockage ratio effects of the air intake segment on the back-propagation in the air-breathing pulse detonation engine. The reliability of the numerical simulation was verified with the experimental results. The simulation results indicated that the wedge-shaped configuration was the most efficient geometry for back-propagation suppression in this paper. The back-propagation suppression performance in the case of wedge-shaped angle of 30° was better than that of wedge-shaped angle of 45° and 60°. In addition, based on the wedge-shaped air intake segment with a wedge-shaped angle of 30°, the back-propagation intensity and the arrival range of the burnt gas both decreased accordingly at the increased blockage ratio. When the blockage ratio was 0.8, the burnt gas could not flow into the inlet. In order to achieve the optimal performance of back-propagation suppression, the configuration and the blockage ratio of the air intake segment should both be optimized further according to the characteristics of the back-propagation pressure. © 2021 Elsevier Masson SAS
Number of references: 39
Main heading: Air intakes
Controlled terms: Backpropagation - Numerical models - Pulse detonation engines - Jet engines - Aircraft engines
Uncontrolled terms: Air intake configuration - Air-breathing pulse detonation engines - Back Propagation - Back-propagation suppression - Blockage ratio - Burnt gas - Configuration optimization - Suppression method - Wedge-shaped angle
Classification code: 631.1 Fluid Flow, General - 653.1 Aircraft Engines, General - 654.2 Rocket Engines - 723.4 Artificial Intelligence - 921 Mathematics
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139. Prediction model of compaction process parameters for pavement of cement emulsified asphalt mixture based on effective compaction work

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Authors: Cui-hong, Zhang (1); Xue-peng, Cao (2); Wen-kui, Xi (1); Wen-lan, Wei (1)
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Language: English
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Cement emulsified asphalt mixture (CEAM) is a semi-flexible pavement material, which is formed by the organic combination of aggregate, cement, emulsified asphalt and water. The compaction process of CEAM includes demulsification of emulsified asphalt, hydration of cement, evaporation of water, and formation of a three-dimensional interwoven network of aggregate, cement and asphalt. Therefore, it has different compaction deformation characteristics from the hot asphalt mixture. In order to explore the theoretical model of compaction process parameters for pavement (PCPP), which are based on compaction deformation characteristics and strain energy theory, effective compaction work (ECW) was defined as the compaction work consumed by viscoplastic compression displacement of the material. The mechanical response is studied by compressive testing and a calculation model for lab-scale effective compaction work (LECW) is established for CEAM. Furthermore, a calculation model for effective compaction work in pavement (PECW) is established based on the work-energy equivalence principle and roller compaction datas. In addition, a prediction model of PCPP for target dense degree (TDD) is obtained by the equivalence of LECW and PECW, and the introduction of energy absorption efficiency (EAE). Moreover, the PCPP combination modes during three stages, i.e., initial compaction, re-compaction and final compaction, of the roller are determined according to the compaction deformation characteristics of CEAM material. Based on the compaction combinations modes, the compaction process parameters combinations (CPPC) during the three compaction stages for the TDD are derived from the prediction model. The reliability of the proposed model is verified by a road compaction test. The CPPC results reveal the reliability of established LECW and PECW models. However, the EAE of vibration compaction in the prediction model is revised to be 76.05% after the road compaction test. The prediction model and introduction of EAE provide a theoretical baseline for the parametric design of compaction and construction process of CEAM and other pavement materials. © 2021 Elsevier Ltd
Number of references: 33
Main heading: Cements
Controlled terms: Absorption efficiency - Aggregates - Water absorption - Deformation - Emulsification - Forecasting - Energy absorption - Mixtures - Strain energy - Asphalt mixtures - Compaction - Pavements
Uncontrolled terms: Compressive testing - Construction process - Deformation Characteristics - Effective compactions - Energy absorption efficiency - Hydration of cements - Mechanical response - Theoretical modeling
Classification code: 406 Highway Engineering - 411.1 Asphalt - 412.1 Cement - 412.2 Concrete Reinforcements - 802.3 Chemical Operations - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 7.60e+01%
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140. A discontinuous discrete fracture model for coupled flow and geomechanics based on FEM

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Authors: Wei, Shiming (1, 2); Kao, Jiawei (1, 2); Jin, Yan (1, 2); Shi, Can (1, 2); Xia, Yang (1, 2); Liu, Shun (3)
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Corresponding author: Jin, Yan(jinycup@126.com)
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Abstract: A discontinuous discrete fracture model of coupled flow and geomechanics for fractured reservoirs is presented in this paper. Two problems of hydraulic fracturing and production are solved to prove the feasibility of the proposed model. The same grid nodes are shared by the flow and geomechanics parts, except the fracture junctions. Galerkin finite element method is used to discretize the flow equations and the mechanical equations. The meshing process is divided into two steps to avoid mesh concentration in the vicinity of the fracture. Implementing the discontinuous discrete fracture model is validated for three problems with analytical solutions and numerical solutions. Compared with the discrete fracture network model, the stress singularities in fracture tips can be captured by the discontinuous discrete fracture model. The discontinuous discrete fracture model can be used to simulate the fracture propagation. In this paper, the hydraulic fracturing process of four horizontal wells is simulated, and the production of each well is predicted with simulated hydraulic fractures. The methodology is then applied to simulate the production process of an artificially fractured shale oil reservoir containing intersected fractures. By slightly changing the mechanical condition on the fracture surfaces, we showed the importance of proppants in well production. The discontinuous discrete fracture model provides a more realistic description of the fracture aperture variation during the production process. More importantly, it offers a method to simulate the hydraulic fracturing and production processes in sequence. The design of infill-well fracturing can also be optimized with the proposed model. © Elsevier B.V.
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Controlled terms: Horizontal wells - Petroleum reservoirs - Finite element method - Geomechanics - Shale - Hydraulic fracturing - Petroleum reservoir engineering
Uncontrolled terms: Coupled flow - Discontinuous fracture - Discrete fractures - Discrete-fracture models - Fracture propagation - Fractured reservoir - Fully coupled flow and geomechanic - Grid node - Hydraulic fracturing process - Production process
Classification code: 481 Geology and Geophysics - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 921.6 Numerical Methods - 931.1 Mechanics - 951 Materials Science
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141. Study on fracture propagation and interaction mechanism during hydraulic fracturing (*Open Access*)

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Authors: Zheng, Peng (1, 2); Zhou, Desheng (2)
Author affiliation: (1) Geological Resources and Geological Engineering, Xi'an University of Science and Technology, Xi'an, Shaanxi Province; 710054, China; (2) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an, Shaanxi Province; 710065, China
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Language: English
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Document type: Conference article (CA)
Conference name: 2020 5th International Conference on Renewable Energy and Environmental Protection, ICREEP 2020
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Publisher: IOP Publishing Ltd
Abstract: With the widespread application of hydraulic fracturing technology, the corresponding numerical simulation methods have been rapidly developed, and we have a deep understanding about the fracture propagation trajectory during hydraulic fracturing at the same time. However, the fracture interference mechanism during hydraulic fracturing is still insufficiently understood. Based on linear elastic fracture mechanics and relevant fracture criterion, a simulation model was established to simulate the fracture propagation by using boundary element method. The interaction mechanisms between fractures are studied. Results show that hydraulic fractures will change distribution direction of formation stresses during propagation process, and asymmetric fractures tend to merge together during propagation. The reverse propagation phenomenon between two fractures in numerical simulation rarely exists in the actual formation.The analysis and research on the mechanism of crack propagation and interaction can provide a theoretical basis for the trajectory control of hydraulic cracks in the later period. © Content from this work may be used under the terms of the Creative Commons Attribution 3.0 Licence.
Number of references: 16
Main heading: Hydraulic fracturing
Controlled terms: Boundary element method - Numerical models - Numerical methods - Fracture - Sailing vessels - Crack propagation
Uncontrolled terms: Fracture criteria - Fracture propagation - Interaction mechanisms - Interference mechanisms - Linear elastic fracture mechanics - Numerical simulation method - Propagation process - Trajectory control
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 674.1 Small Marine Craft - 921 Mathematics - 921.6 Numerical Methods - 951 Materials Science
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Compendex references: YES
Open Access type(s): All Open Access, Gold
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142. Method for Potential Evaluation and Parameter Optimization for CO2-WAG in Low Permeability Reservoirs based on Machine Learning (*Open Access*)

Accession number: 20210910008876
Authors: Lv, Wenfeng (1); Tian, Weidong (2); Yang, Yongzhi (1); Yang, Jinghui (3); Dong, Zhenzhen (2); Zhou, Yongyi (4); Li, Weirong (1)
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Corresponding author: Li, Weirong(weirong.li@xsyu.edu.cn)
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Conference code: 167246
Sponsor: CCCC Second Harbour Engineering Company Ltd.; Chishun Chemical; Wanxiang Group Technology Center
Publisher: IOP Publishing Ltd
Abstract: The CO2 water-alternating-gas flooding (CO2-WAG) is a key technology to improve the oil recovery of low permeability reservoirs. The effect of CO2 flooding to enhance the oil recovery is affected by geological conditions and production systems. The effect of CO2 flooding parameters on the enhanced recovery factor should be clarified to optimize the production system. In this paper, the machine learning algorithms are used to carry out the study and establish a set of procedures for optimizing CO2 flooding parameters based on the artificial neural network (ANN) and the particle swarm optimization (PSO) algorithm. Firstly, large amounts of basic data are generated by the Monte Carlo sampling method. Then, the recovery factor by the water flooding and the CO2-WAG and the enhanced recovery factor by CO2-WAG in different models are calculated in the reservoir numerical simulator. Moreover, the machine learning method is used to establish a neural network model, and analysis of the sensitivity of parameters of the enhanced oil recovery (EOR) is carried out by combining with the Sobol method. Finally, the neural network model and the particle swarm algorithm are combined to optimize the parameters of CO2-WAG flooding. The results show that the established model has a good prediction accuracy (97.6%), thus it could be used to predict the enhanced recovery factor by CO2-WAG, and it is applicable in potential evaluation of enhancing the oil recovery and optimization for parameters in the CO2-WAG well group. © Published under licence by IOP Publishing Ltd.
Number of references: 16
Main heading: Carbon dioxide
Controlled terms: Computer system recovery - Enhanced recovery - Floods - Monte Carlo methods - Oil well flooding - Parameter estimation - Reservoirs (water) - Machine learning - Neural network models - Particle swarm optimization (PSO) - Petroleum reservoir engineering - Learning algorithms - Low permeability reservoirs
Uncontrolled terms: Enhanced oil recovery - Geological conditions - Machine learning methods - Parameter optimization - Particle swarm algorithm - Particle swarm optimization algorithm - Sensitivity of parameters - Water alternating gas
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 723 Computer Software, Data Handling and Applications - 723.4 Artificial Intelligence - 723.4.2 Machine Learning - 804.2 Inorganic Compounds - 921.5 Optimization Techniques - 922.2 Mathematical Statistics
Numerical data indexing: Percentage 9.76e+01%
DOI: 10.1088/1755-1315/651/3/032038
Compendex references: YES
Open Access type(s): All Open Access, Bronze
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143. Characteristics and controlling factors of lacustrine source rocks in the Lower Cretaceous, Suhongtu depression, Yin-E basin, Northern China

Accession number: 20210909997338
Authors: Qi, Kai (1, 2); Ren, Zhanli (1, 2); Chen, Zhipeng (3); Cui, Junping (1, 2)
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Corresponding author: Ren, Zhanli(renzhanl@nwu.edu.cn)
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Article number: 104943
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Lacustrine source rocks are widely distributed in the Mesozoic rift basins of northern China. Two lacustrine rift sub-depressions in the Suhongtu depression, Yin-E Basin, have been subjected to a comprehensive analysis of their source rock potential to further reveal the controlling factors and enrichment mechanisms by constructing models for lacustrine source rocks in different tectonic settings. The Hari sag in the Suhongtu depression has significantly greater sedimentary cover and better hydrocarbon generation conditions when compared to the Babei sag by comprehensive analyses of total organic carbon (TOC), chloroform bitumen "A", Rock-Eval pyrolysis and #13CPDB. The results show that source rock deposition was affected by organic productivity, organic matter preservation and sedimentation rates. The TOC and #13CPDB values indicate that there was higher productivity in the lakes of the Hari sag, and productivity reached a maximum during the deposition of the Yingen Formation. The total reduced sulphur (TRS), Pr/Ph, and gammacerane index values indicate that a relative reducing environment was present in the Hari sag. During deposition of the Bayingebi Formation in the Hari sag, the water was suboxic-anoxic, gradually turning anoxic and finally formed a strongly reducing, high-salinity, stratified water environment during deposition of the Yingen Formation. The Babei sag was suboxic-oxidizing throughout the deposition of the Lower Cretaceous lacustrine mudstones. With more active boundary faults and higher sedimentation rates, the terrigenous organic matter inputs to the Hari sub-depression were higher than those in the Babei sub-depression. These observations permitted the development of a model for the formation mechanism for the effective lacustrine source rocks in the Cretaceous fault basin of the Suhongtu depression. In the Hari sag, during source rock deposition of the K1b and K1s formations, intense and more active faults resulted in high terrigenous organic matter being carried into the lake. However, rapid sedimentation rates caused organic matter dispersed. During source rock deposition of the K1y Formation, the sag entered a transition stage from synrift to post-rift with an intermediate sedimentation rate. More organic matter was continuously transported into the basin with high salinity and a strongly reducing sedimentary environment, which caused enrichment of organic matter. In the Babei sag, due to small-scale rifting structures and shallow water conditions, a relatively low influx of terrigenous organic matter and suboxic to oxidizing conditions were developed. This study have important implications for source rock prediction in other lacustrine rift basins. © 2021
Number of references: 102
Main heading: Lakes
Controlled terms: Chlorine compounds - Organic carbon - Sedimentary rocks - Sedimentation - Biogeochemistry - Faulting - Productivity - Sedimentology
Uncontrolled terms: Comprehensive analysis - Hydrocarbon generation - Lacustrine source rocks - Organic matter inputs - Organic matter preservations - Sedimentary environment - Source rock potential - Total Organic Carbon
Classification code: 481.1 Geology - 481.2 Geochemistry - 482.2 Minerals - 484.1 Earthquake Measurements and Analysis - 801.2 Biochemistry - 802.3 Chemical Operations - 804.1 Organic Compounds
DOI: 10.1016/j.marpetgeo.2021.104943
Funding Details: Number: 2017ZX05005002-008, Acronym: -, Sponsor: -; Number: 41630312,41702117, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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144. Shellshock Bash Vulnerability Modeling Analysis Based on Petri Net

Accession number: 20220611596018
Authors: Zhang, Liumei (1); Deng, Xi (1); Wang, Yichuan (2, 3)
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Conference name: 2021 International Conference on Networking and Network Applications, NaNA 2021
Conference date: October 29, 2021 - November 1, 2021
Conference location: Lijiang City, China
Conference code: 175487
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The enhancement of Internet connectivity and the increase of information transmission speed yield the increasing frequency of network attacks. The Shellshock attackers often exploit bash vulnerability to read the content behind the function definition when importing environment variable functions. Then, malicious scripts can be executed in systems and servers, which compromises everything. Therefore, this paper proposes a formal modeling analysis method for the Shellshock Bash basis and automates the analysis of the patched position of the model. The relationship between the established model and the actual attack process is also discussed, which is a feasible reference for exploring unknown vulnerabilities and the location of corresponding patches. © 2021 IEEE.
Number of references: 20
Main heading: Petri nets
Controlled terms: Computer crime - Network security
Uncontrolled terms: Function definitions - Information transmission - Internet connectivity - Modeling analyzes - Network attack - Petri models - Shellshock - Transmission speed - Vulnerability analysis - Vulnerability models
Classification code: 723 Computer Software, Data Handling and Applications - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.1109/NaNA53684.2021.00049
Funding Details: Number: U20B2050, Acronym: -, Sponsor: -; Number: 61702411,61773313,62072368, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018YFB1201500, Acronym: -, Sponsor: National Basic Research Program of China (973 Program); Number: 2017ZDXMGY-098,2019TD-014,2020GY-039,2021ZDLGY05-09, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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145. Insights into Growth Kinetics of Colloidal Gold Nanoparticles: In Situ SAXS and UV-Vis Evaluation

Accession number: 20210209754720
Authors: Chen, Xuelian (1); Wang, Jinge (1); Pan, Ruijuan (1); Roth, Stephan (2); Förster, Stephan (3)
Author affiliation: (1) College of Materials Science and Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) HASYLAB/DESY, Notkesstr. 85, Hamburg; 22607, Germany; (3) JCNS-1/ICS-1, Forschungszentrum Jülich, Jülich; 52425, Germany
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Document type: Journal article (JA)
Publisher: American Chemical Society

Abstract: Understanding the formation process and kinetics is of vital importance for preparing monodisperse colloidal nanocrystals with controllable size and morphology in a predictive way. However, in-depth understanding of nucleation and growth mechanisms is impeded due to the lack of reliable and complete in situ experimental data from molecular precursors to colloidal nanocrystals. Herein we used in situ UV-vis and synchrotron-based time-resolved in situ small-angle X-ray scattering to monitor the reduction kinetics of gold salt and the fast nucleation and growth kinetics of gold nanoparticles synthesized in stopped flow microfluidics through the reduction of a gold precursor by a morpholine-borane complex in the presence of oleylamine or the combination of oleylamine and oleic acid ligands. Our method enables obtaining detailed information on the evolution of size, size distribution, the number of particles, and monomer concentration by probing the original reaction solution over time. Through quantitative analysis of in situ SAXS and UV-vis data, complex growth trajectories involving the coalescence of small particles, intraparticle growth within coalesced nanoparticles, and surface-reaction limited focusing of size-distribution events could be identified in the synthesis of monodisperse Au NPs for both cases. When an oleic acid ligand is present in the system, it can cause the dissolution of larger particles, followed by the growth of small ones at the expense of larger ones at the initial growth stage before coalescence event. The polydispersity of 20% is found to be a quantitative indicator for the transition of the intraparticle growth event to the focusing of a size distribution mechanism for both cases. In the later focusing process, the polydispersity can be significantly narrowed from 15% to 9%, while the particle size keeps almost constant. By quantitative analysis of the growth process, we can conclude that nucleation and the growth process are dependent on ligand-NP binding affinity. We believe that our findings can further advance the understanding of the growth kinetics and mechanisms of oleylamine-capped metal nanocrystals. © 2020 American Chemical Society.
Number of references: 44
Main heading: Growth kinetics
Controlled terms: Coalescence - Synthesis (chemical) - Metal nanoparticles - Particle size - Morphology - Gold nanoparticles - Ligands - Nanocrystals - Binding energy - Surface reactions - X ray scattering - Fiber optic sensors - Nucleation - Oleic acid - Particle size analysis - Size distribution - Kinetics
Uncontrolled terms: Colloidal gold nanoparticles - Colloidal nanocrystals - Growth trajectories - In-depth understanding - Kinetics and mechanism - Monomer concentration - Nucleation and growth - Quantitative indicators
Classification code: 631.1 Fluid Flow, General - 741.1.2 Fiber Optics - 761 Nanotechnology - 801.3 Colloid Chemistry - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 922.2 Mathematical Statistics - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 932.1 High Energy Physics - 933.1 Crystalline Solids - 933.1.2 Crystal Growth - 951 Materials Science
Numerical data indexing: Percentage 1.50e+01% to 9.00e+00%, Percentage 2.00e+01%
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Funding Details: Number: YCS19212059, Acronym: -, Sponsor: -; Number: 2019JQ-184, Acronym: -, Sponsor: Natural Science Foundation of Shanxi Province;
Funding text: Research funding from the Natural Science Foundation of Shanxi Province (No. 2019JQ-184) is greatly acknowledged by the authors. J.W. acknowledges funding from Xi'an Shiyou University Foundation (No. YCS19212059).
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Data Provider: Engineering Village
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146. Influence of unconnected pores on effective stress in porous geomaterials: Theory and case study in unconventional oil and gas reservoirs

Accession number: 20210409810666
Authors: Gao, Yanfang (1); Chen, Mian (2); Jiang, Hailong (3)
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Corresponding author: Gao, Yanfang(yanfang_gao@163.com)
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Volume: 88
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Publication year: 2021
Article number: 103787
Language: English
ISSN: 18755100

Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Unconventional oil and gas reservoirs are mostly characterized by unconnected pores and abnormal pore pressures. These conventional effective stress theories, such as Biot's theory, cannot display the quantitative relationship between unconnected pores' micro characteristics and the macro stress applied to the solid structure. These parameters related to the unconnected pores should be quantitatively incorporated in the effective stress formula. In this paper, two modified models were proposed to evaluate the solid framework's real effective stress and deformation. The effects of the unconnected pore pressure, unconnected porosity, and unconnected pore fluid's compressibility on effective stress and volumetric strain were theoretically investigated. It was found that the increase of unconnected pore pressure can decrease the effective stress and volumetric strain. For an abnormal high pore pressure formation, the growth of unconnected porosity can reduce the effective stress but increase the volumetric strain. The decrease of the unconnected pore fluid's compressibility can increase and decrease the effective stress and volumetric strain for abnormal low and high pore pressure reservoirs, respectively. Two case studies on the abnormal pore pressures induced by under-compaction and hydrocarbon generation were conducted. The results showed that the pore pressure exhibits significant increases when the unconnected pores and unconnected pore fluids are proactively compressed in the processes of under-compaction and hydrocarbon generation, respectively. The abnormal high pore pressures in these tight sandstone reservoirs in the Sichuan Basin, Tarim Basin, and Bohai Bay Basin can be theoretically generated when the pore space is compressed to 95%–84% of the initial pore space. The model can evaluate the effective stress and deformation for reservoirs with considerable unconnected porosities. In turn, it can also interpret the abnormal pressure generation induced by the changes of unconnected porosity and pore fluid's compressibility. © 2020 Elsevier B.V.
Number of references: 51
Main heading: Pore pressure
Controlled terms: Porosity - Compaction - Pore fluids - Compressibility - Petroleum reservoir engineering - Deformation - Hydrocarbons - Petroleum reservoirs
Uncontrolled terms: Abnormal pressure - Effective stress - Hydrocarbon generation - Micro characteristics - Pressure formation - Tight sandstone reservoirs - Unconventional oil and gas - Volumetric strain
Classification code: 483.1 Soils and Soil Mechanics - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 631.3 Flow of Fluid-Like Materials - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.jngse.2020.103787
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147. Study on Heat Distribution Characteristics of Direct Safety Injection of Reactor Pressure Vessel

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Title of translation:
Authors: Jiang, Xing (1); Weng, Yu (2); Wang, Haijun (3)
Author affiliation: (1) Shanghai Nuclear Engineering Research and Design Institute Co., Ltd., Shanghai; 200233, China; (2) School of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) Xi'an Jiaotong University, Xi'an; 710049, China
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Abbreviated source title: Hedongli Gongcheng
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Publication year: 2021
Pages: 119-122

Language: Chinese
ISSN: 02580926
CODEN: HDGOE6
Document type: Journal article (JA)
Publisher: Atomic Energy Press
Abstract: In the passive PWRs in China, the cooling water injection pipe for emergency cooling system is directly connected to the pressure vessel. Unlike the traditional safety injection (SI) of cold leg, this SI mode is called reactor direct SI. For the reactor pressure vessel under the SI conditions, this paper studies the heat distribution shape of the SI fluid on the surface of the pressure vessel by the combination of physical experiment and numerical analysis. As shown in the study, unlike the traditional oblique nozzle SI mode for cold leg of the main pipe, the distribution of SI fluid in the downcomer annulus is approximately in the shape of an isosceles triangle under the direct SI condition. Based on the experimental results and the numerical calculation and verification, the heat distribution angle of the pressure vessel is found directly proportional to the flow rate ratio, and moreover, the calculation model of the SI fluid distribution is proposed for reference in the reactor safety design. © 2021, Editorial Board of Journal of Nuclear Power Engineering. All right reserved.
Number of references: 10
Main heading: Pressure vessels
Controlled terms: Cooling water - Pressurized water reactors
Uncontrolled terms: Cold leg - Direct safety injection - Heat distribution - Injection conditions - Injection fluids - Injection mode - Numerical calculation - Reactor Pressure Vessel - Safety injection - Visual experiments
Classification code: 619.2 Tanks
DOI: 10.13832/j.jnpe.2021.05.0119
Compendex references: YES
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148. Research on Kalman filter for one-dimensional discrete data (*Open Access*)

Accession number: 20213810907782
Authors: Wei, Fan (1); Zhang, Zupei (1); Jia, Kunpeng (2)
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Corresponding author: Zhang, Zupei(19212060636@stumail.xsyu.edu.cn)
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Issue: 1
Issue title: 2021 International Conference on Information Technology and Intelligent Control, CITIC 2021
Issue date: August 24, 2021
Publication year: 2021
Article number: 012005
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2021 International Conference on Information Technology and Intelligent Control, CITIC 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Guilin, Virtual, China
Conference code: 171600
Publisher: IOP Publishing Ltd
Abstract: Kalman filter processes the input and observation signals with noise on the basis of linear state space representation to obtain the system state or real signal. In the one-dimensional model, due to the lack of multi-dimensional description of the target, the prior estimate of the state is often the measured value of the previous moment. When the target state changes, the divergence phenomenon will occur. Aiming at the problem that the one-dimensional traditional Kalman filter lacks the target observation dimension, which leads to the divergence or imprecision of the filter, this paper focuses on improving the estimation method of the target state, and proposes a real-time prediction model based on the cascade structure. This model can improve the response of Kalman filter to the change of target state and dynamically adjust the Kalman iterative domain to improve the measurement accuracy.

The digital signal filtering simulation is carried out and the performance of the filter is verified based on LabVIEW. Experimental results show that the algorithm can maintain the accuracy and real-time performance of filtering when only one dimension observation results are obtained. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 10
Main heading: Kalman filters
Controlled terms: State space methods - Iterative methods
Uncontrolled terms: Cascade structures - Estimation methods - Measurement accuracy - One-dimensional model - Real time performance - Real-time prediction - State space representation - Traditional Kalman filters
Classification code: 921 Mathematics - 921.6 Numerical Methods
DOI: 10.1088/1742-6596/2005/1/012005
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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149. Establishment and application of a well testing analysis model for partially penetrating fractured wells with unsteady interporosity flow

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Title of translation:
Authors: Shi, Xinpu (1); Du, Guo (1); Yang, Dan (1); Zhou, Xingyan (1); Zheng, Weige (2); Lin, Jia'en (3)
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Corresponding author: Zheng, Weige(zwg_sol@126.com)
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Pages: 1357-1363
Language: Chinese
ISSN: 02532697
CODEN: SYHPD9
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Due to the characteristics of volcanic rocks such as thick productive formations of gas reservoirs, various rock types, complicated and changeable lithologies and lithofacies, strong heterogeneity, and development of natural fractures, it is difficult to open all reservoir body by fracturing fractures during development of fractured wells. Natural fractures are dominated by vertical clinofractures and high-angle fractures, and plenty of well test data show that there are obvious characteristics of unsteady interporosity flow between media. In view of the above characteristics, considering the partially penetrating reservoir body by fracturing fractures, the matrix has been simplified to the columnar matrix evenly and alternatively distributed together with natural fractures; a well testing analysis model is established for the fractured wells partially penetrating using unsteady interporosity flow. Further, this model is solved using the point-source model, and the method of separation of variables; additionally, a chart of typical curves is drawn. The typical curve is divided into six main flow sections:well bore storage section, transition section, linear flow section, spherical flow section, unsteady interporosity flow section and boundary reflection section. The boundaries include infinite boundaries and closed boundaries, and a sensitivity analysis is carried out on the parameters such as fracture half-length. Taking a fractured well in a block of the Kelameili volcanic gas reservoir as an example, this paper analyzes the well test curve and gives well test interpretation. The results show that the horizontal permeability of the fractured well is small, the vertical permeability is particularly large, and the partially penetrating degree is relatively small, basically consistent with static and dynamic data. © 2021, Editorial Office of ACTA PETROLEI SINICA. All right reserved.
Number of references: 32
Main heading: Matrix algebra
Controlled terms: Horizontal wells - Petroleum reservoirs - Sensitivity analysis - Well testing - Natural fractures - Digital storage - Volcanoes

Uncontrolled terms: Fractured well - Gas reservoir - Interporosity flow - Natural fracture - Partially penetrating - Unsteady interporosity flow - Volcanic gas - Volcanic gas reservoir - Well testing analysis - Well-test analysis
Classification code: 421 Strength of Building Materials; Mechanical Properties - 484 Seismology - 512.1.1 Oil Fields - 722.1 Data Storage, Equipment and Techniques - 921 Mathematics - 921.1 Algebra
DOI: 10.7623/syxb202110009
Compendex references: YES
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150. Role of amorphous layer and interfaces on the tensile behaviors of triple-phase Ti/Ni nanolaminates: A molecular dynamics study

Accession number: 20211210126425
Authors: Su, Mengjia (1); Deng, Qiong (1); An, Minrong (2); Liu, Lanting (1); Chen, Lianyang (1)
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Publisher: Elsevier Ltd
Abstract: Superior properties of Ti/Ni nanolaminates prompt researchers to comprehend their mechanical behaviors deeply. Lacking investigations at several nanometers range limits their applications in high-precision fields, as the amorphous phase can be formed at the junction regions. By using the molecular dynamics method, three models are chosen to investigate the role of the amorphous layer and different interfaces in triple-phase Ti/Ni nanolaminates during the tensile process. The results demonstrate that mechanical performances of triple-phase nanolaminates are closely related to the fraction of crystalline and amorphous phases. Strength of the nanolaminates decreases with increasing amorphous layer spacing (d). However, acceptable plastic properties can be achieved when amorphous layer spacing satisfies $d \leq 3.91$ nm. Microstructure evolution analysis reveals different plastic deformation carriers nucleate and propagate in crystalline and amorphous layers, which contains grain reorientation and basal dislocation propagation in Ti layer, partial dislocations propagation in Ni layer, formation and expansion of shear transformation zones in the amorphous layer. Plastic co-deformation of dissimilar phases dominates the plastic deformation of triple-phase nanolaminates. Crystalline/crystalline interfaces (CCIs) and amorphous/crystalline interfaces (ACIs) also play vital roles in plastic deformations. CCIs impede and absorb the grain boundaries moving toward the interfaces and then act as dislocation sources. ACIs accommodate local deformation at the interfacial regions, and are preferred sites for different plastic deformation carries nucleation. ACIs and CCIs can also connect the plastic deformation carries in different phases, which improves the overall plasticity of triple-phase nanolaminates. The insights obtained in this work can promote the design and application of advanced Ti/Ni nanolaminated materials. © 2021 Elsevier B.V.
Number of references: 50
Main heading: Molecular dynamics
Controlled terms: Plastic deformation - Grain boundaries
Uncontrolled terms: Amorphous layer - Amorphous layer spacing - Amorphous phasis - Amorphous/crystalline interface - Crystalline interfaces - Crystalline/crystalline interface - Layer-spacing - Nanolaminate - Plastic co-deformation - Triple-phase ti/ni nanolaminate
Classification code: 801.4 Physical Chemistry
Numerical data indexing: Size 3.91E-09m
DOI: 10.1016/j.jallcom.2021.159282
Funding Details: Number: 2019JQ-827, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0672, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

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151. Design of Half-bridge Bidirectional DC-DC Converter Control Loop (*Open Access*)

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Authors: Cheng, Huan (1); Guo, Yingna (2); Ma, Zhao (3); Bai, Sisi (1)
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In recent years, the direct current (DC) microgrid system has received extensive attention from industrial and academic circles worldwide. As an essential part of the DC microgrid, the bidirectional DC-DC converter can realize the bidirectional flow of energy according to the needs of the DC microgrid. In this paper, the half-bridge bidirectional DC-DC converter is taken as the research object, and the double closed-loop feedback control loop of the converter in the charging and discharging mode is designed based on the intermittent and fluctuating characteristics of distributed generation. Besides, a simulation model is built using MATLAB to analyze the operation of the converter in different modes and the control effect of the double closed-loop feedback control loop. The results verify the effectiveness and feasibility of the proposed control method. © Published under licence by IOP Publishing Ltd.
Number of references: 7
Main heading: MATLAB
Controlled terms: Feedback control - Electric inverters - Bridges - DC-DC converters - Closed loop control systems
Uncontrolled terms: Bi-directional flows - Bidirectional DC-DC converters - Control methods - Double closed loop - Half-bridge bidirectional - Micro-grid systems - Research object - Simulation model
Classification code: 401.1 Bridges - 704.1 Electric Components - 723.5 Computer Applications - 731.1 Control Systems - 921 Mathematics - 961 Systems Science
DOI: 10.1088/1742-6596/1894/1/012004
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Funding text: Project Supported by Natural Science Basic Research Program of Shaanxi, (Program No. 2020JM-542).This research project is supported by the natural science foundation research program of Shaanxi Province (Program No. 2020JM-542) and the innovation and practice ability training project of Xi'an Petroleum University (Program No. YCS20213173).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
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152. "Three-dimensional closed system" accumulation model of Taiyang anticline mountain shallow shale gas in the Zhaotong demonstration area

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Title of translation: ""
Authors: Liang, Xing (1); Shan, Changan (2); Zhang, Zhao (1); Xu, Zhengyu (3); Xu, Jinbin (1); Wang, Weixu (1); Zhang, Jiehui (1); Xu, Yunjun (3)
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Corresponding author: Liang, Xing(liangx85@petrochina.com.cn)
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Publication year: 2021
Pages: 3380-3399
Language: Chinese
ISSN: 00015717
Document type: Journal article (JA)
Publisher: Geological Society of China
Abstract: This study aims to realize the large-scale and efficient development of the Taiyang shallow shale gas and provide a reference for the shallow shale gas exploration in other areas. To achieve this objective, the tectonic fault system, roof and floor conditions, sedimentary facies, high quality shale distribution, hydrocarbon storage conditions and the law of enrichment and high yield in the Taiyang region are systematically analyzed. Five characteristics of the proposed "three-dimensional closed system" compartment accumulation model of mountain shallow shale gas in the Taiyang anticline are: The overlying thick layer of dense shale and marlstone of the second sub-segment of the first member of the Longmaxi Formation to the Shiniulan Formation, and the underlying thick layer dense nodular limestone of Linxiang and Baota Formations, form a good barrier conditions of roof and floor of the compartment. The fault system, formed against a background of compressive and torsional stress, belongs to compressional thrust fault and compression-torsional strike-slip fault with good longitudinal sealing, which effectively protects high quality shale gas reservoir. The lithology of the connection between the two sides of shale gas layers on the fault is dense marl and limestone. There is no leakage point for shale gas because of the good lateral sealing of the fault, so the mountain shallow shale gas still has the characteristics of continuous gas reservoir. The "water retention+volcanic ash deposition" in foreland basin created the deep-water shelf sedimentary environment of "flourishing marine floating organisms+anoxic strong reduction", formed the high-quality hydrocarbon source rock reservoir with "rich carbon, high silicon, low viscosity and high fragility", and constructed the shale micro-nanometer reservoir pore space with "large-scale hydrocarbon generation and efficient adsorption and enrichment". The shale reservoir has relatively low in-situ stress and two-direction horizontal stress difference, which is not only conducive to the fracturing operation of the reservoir under medium and low pump pressure, but also has the key factors for fracturing the shale to form complex fracture network and gas well to obtain high yield. Based on these results, the law of "Four enrichment and high yield" of the shallow mountain shale gas in the complex structure area is achieved: the deep water anoxic and strong reduction environment in foreland basin promotes the development of carbon-rich, high-silicon and low-viscosity shale reservoirs (sediment controls reservoir); the continuous good three-dimensional closed storage box system effectively protects the hydrocarbon generation, hydrocarbon retention, hydrocarbon enrichment and overpressure pore protection of organic rich shale (preservation controls gas); shale brittleness, in-situ stress and horizontal stress difference determine the difficulty of SRV fracturing and affect the construction effect of artificial shale gas reservoir (stress controls occurrence); the continuous thickness and formation pressure coefficient of class I high-quality shale gas reservoirs determine the resource and reserve abundance of shale gas and the high production of gas wells (hydrocarbon reservoir control production). The research results are of great significance for the efficient exploration and development of shallow marine shale gas in the complex tectonic area in South China. © 2021, Science Press. All right reserved.
Number of references: 46
Main heading: Floors

Controlled terms: Complex networks - Fertilizers - Fracture - Gases - Geological surveys - Lime - Limestone - Lithology - Petroleum prospecting - Petroleum reservoirs - Roofs - Sedimentology - Shale gas - Strike-slip faults - Volcanoes
Uncontrolled terms: Accumulation model - Closed systems - Enrichment accumulation model - Enrichment and high yield rule - High quality - Higher yield - Mountain shallow shale gas - Taiyang complex structural anticline area - Three-dimensional closed system - Wufeng-longmaxi formation
Classification code: 402 Buildings and Towers - 481.1 Geology - 484 Seismology - 484.1 Earthquake Measurements and Analysis - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 722 Computer Systems and Equipment - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 821.2 Agricultural Chemicals - 951 Materials Science
DOI: 10.19762/j.cnki.dizhixuebao.2021145
Compendex references: YES
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153. Application of borehole transient electromagnetic system in relief well drilling: A case study

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Authors: Changzan, Liu (1); Ling, Yang (2); Chenlu, Zhang (2); Bo, Dang (2)
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Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In the process of offshore and land drilling, once the blowout out of accident occurs, oil and gas resources will be seriously damaged, which will be easy to cause catastrophic events such as casualties and environmental pollution. Drilling a relief well beyond a certain distance around the blowout well to achieve connection is an effective way to control blowout. Affected by the error ellipse, it is difficult for the relief well to hit the accident well directly only depending on the trajectory information, where the relative distance and azimuth information of two wells should be measured in real time. In this paper, the borehole transient electromagnetic system is used to measure the resistivity of surrounding medium in relief well, and the relative distance of two wells can be inversed by using the influence of the accident well casing on the resistivity of surrounding formation. On this basis, the relative azimuth can be calculated in real time by using the spatial geometric positioning algorithm. Moreover, the experiments demonstrated that the proposed system can measure and calculate the relative distance and azimuth between the relief well and the blowout well, and finally guide the successful connection between two wells. © 2021 IEEE.
Number of references: 14
Main heading: Energy resources
Controlled terms: Offshore oil well production - Blowouts - Boreholes - Offshore drilling - Oil well drilling - Transient analysis - Offshore oil wells - Infill drilling

Uncontrolled terms: Catastrophic event - Environmental pollutions - Positioning algorithms - Relative distances - Relief well drilling - Surrounding formations - Trajectory information - Transient electromagnetic systems
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 525.1 Energy Resources and Renewable Energy Issues - 914.1 Accidents and Accident Prevention
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154. Exploration challenges, countermeasures and prospect of mountain shallow shale gas: A cased study on the Zhaotong National Shale Gas Demonstration Area

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Authors: Liang, Xing (1); Zhang, Zhao (1); Shan, Chang'an (2); Zhang, Jiehui (1); Wang, Weixu (1); Xu, Zhengyu (3); Li, Zhaofeng (1); Mei, Jue (1); Zhang, Lei (1); Xu, Jinbin (1); Wang, Gaocheng (1); Xu, Yunjun (3); Jiang, Liwei (1)
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Abstract: Intraplate deformation superimposed by multi-stage tectonic movement results in the particular mountain characteristics of peripheral Sichuan Basin and great difficulty in the gas exploration of the Zhaotong National Shale Gas Demonstration Area. In order to resolve the exploration difficulty of mountain shale gas in the complex tectonic area, this paper comprehensively analyzes the connotation and geological characteristics of mountain shale gas. Based on this, the enrichment and high yield laws of shallow shale gas in Taiyang anticlinal structure of Zhaotong exploration area are summarized, and the corresponding exploration ideas and technical countermeasures are put forward. Finally, its exploration prospect is predicted. And the following research results were obtained. First, mountain shale gas has complex surface landform and inner geological characteristics, such as strong structural deformation, old strata and over mature thermal evolution, so the overall sealing and preservation condition of shale gas is the key to hydrocarbon accumulation. Second, the shale gas reservoirs in this area is of strong heterogeneity, the high shear stress is complex and faults, fracture zones and surface karst caves are developed, so drilling engineering is of high implementation risk and high cost. Third, shallow shale gas in this area is better sealed and preserved vertically and laterally. Under the joint action of roof, floor and sealing faults, a good three-dimensional sealed reservoir space system is formed. Fourth, to cope with the challenges of mountain shale gas and the restrictions of oilfield mining right, the exploration ideas of "stepping out of the stable area of the basin to develop the mountain zone" and "stepping out of the Wufeng Formation and Longmaxi Formation to achieve breakthroughs in other shale strata" are put forward. Fifth, based on the practice of geology-engineering integration, the evaluation concept of "building a transparent manmade-fracture shale gas reservoir in the whole chain" and the working concept of integrated precise control in the whole process are put forward definitely. In conclusion, shallow shale gas resources are abundant in the Zhaotong Shale Gas Demonstration Area and the residual structural depression area of the peripheral Sichuan Basin, and the drilling situations in many zones are good, which indicates a better exploration prospect of shallow shale gas. © 2021, Natural Gas Industry Journal Agency. All right reserved.

Number of references: 43
Main heading: Gases
Controlled terms: Petroleum prospecting - Cost engineering - Deformation - Energy resources - Faulting - Geological surveys - Demonstrations - Petroleum reservoirs - Shale gas - Landforms
Uncontrolled terms: Drilling engineering - Exploration prospects - Geological characteristics - Hydrocarbon accumulation - Preservation condition - Strong heterogeneities - Structural deformation - Technical countermeasures
Classification code: 481.1 Geology - 484.1 Earthquake Measurements and Analysis - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 525.1 Energy Resources and Renewable Energy Issues - 911 Cost and Value Engineering; Industrial Economics
DOI: 10.3787/j.issn.1000-0976.2021.02.004
Compendex references: YES
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Data Provider: Engineering Village
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155. Performance study of a fiber Bragg grating accelerometer based on double-semicircle cantilever

Accession number: 20215211375344
Authors: Luo, Xiaodong (1, 2); Li, Yongfang (1); Feng, Dequan (2); Cheng, Huan (2)
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Conference location: Xi'an, China
Conference code: 175384
Publisher: SPIE
Abstract: As a new type of sensing element, fiber Bragg grating (FBG) has advantages of wavelength modulation, hightemperature resistance, and anti-electromagnetic interference. In this paper, a medium-frequency FBG accelerometer based on a symmetrical double-semicircle cantilever is designed and fabricated. In the sensor, the double-semicircle cantilever acts as the elastic element. FBG is suspended and pasted on the double-semicircle cantilever by its two ends. When the sensor is subjected to the external vibration, the free end of the double-semicircle cantilever will vibrate under the action of inertial force. Correspondingly, the FBG is driven to produce axial strain. The structure and working principle of the sensor are well illustrated, the natural frequency and sensitivity of the sensor are analyzed as well. In order to verify the dynamic sensing characteristic of the sensor, some experiments are performed. Experimental results show that the natural frequency of the sensor is 410 Hz, the working frequency range is 50#300Hz, and the average acceleration sensitivity is almost 133pm/g. In the range of working frequency, FBG wavelength has a good response to the vibration acceleration, and the linearity is better than 99%. Research indicates that the proposed FBG accelerometer can be used to measure the vibration acceleration of 50 _ 300Hz with higher sensitivity, and the sensor has the merits of small size, light mass, high sensitivity, wide working band and easy fabrication, which makes it a good candidate for acceleration measurement. © 2021 COPYRIGHT SPIE.
Number of references: 7
Main heading: Fiber Bragg gratings

Controlled terms: Nanocantilevers - Electromagnetic pulse - Acceleration - Accelerometers - Natural frequencies
Uncontrolled terms: A.Fibres - Fiber bragg grating - Fiber bragg grating accelerometer - High sensitivity - High-temperature resistance - Performance study - Sensing elements - Vibration acceleration - Wavelength modulation - Working frequency
Classification code: 701 Electricity and Magnetism - 761 Nanotechnology - 933 Solid State Physics - 943.1 Mechanical Instruments
Numerical data indexing: Frequency 3.00E+02Hz, Frequency 4.10E+02Hz, Percentage 9.90E+01%, Size 1.33E-10m
DOI: 10.1117/12.2605522
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156. Image Mosaic in Visual Detection of Wellbore (*Open Access*)

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Authors: Xifeng, Y.I. (1); Yuguo, Liu (1); Feng, Zhang (1); Hengchao, Gao (1); Yugang, Tian (1); Jianfei, Wei (1); Zhengguo, Yan (2); Yinchuan, W.U. (2)
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Corresponding author: Yinchuan, W.U.(ychwu@xsyu.edu.cn)
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Conference location: Xi'an, Shaanxi, China
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Publisher: IOP Publishing Ltd
Abstract: Based on the research on the visual detection system, this paper analyzes the characteristics of wellbore video (image), proposes the key techniques of image processing, and designs the methods of image mosaic. The experiment results show that when the image correction, the perspective transform, the image registration, and image fusion are implemented, a panoramic image of wellbore can be obtained. This study provides a new perspective for the visual detection and the technology reserves for further quantitative evaluation of visual detection. © Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Image fusion
Controlled terms: Boreholes - Oil field equipment
Uncontrolled terms: Image correction - Image mosaic - Panoramic images - Perspective transforms - Quantitative evaluation - Visual detection - Wellbore
Classification code: 511.2 Oil Field Equipment - 723.2 Data Processing and Image Processing
DOI: 10.1088/1742-6596/1894/1/012060
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157. A fiber Bragg grating accelerometer based on Y-shaped symmetrical beam structure

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Authors: Luo, Xiaodong (1, 2); Li, Yongfang (1); Zhang, Jianxin (1); Gao, Hong (2)
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Corresponding author: Luo, Xiaodong(xdluo@xsyu.edu.cn)
Source title: Optical Fiber Technology
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Issue date: October 2021
Publication year: 2021
Article number: 102649
Language: English
ISSN: 10685200
CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: A novel fiber Bragg grating (FBG) accelerometer is proposed. The accelerometer is based on a compact symmetrical structure consisting of a Y-shaped beam and an FBG. The mechanical model and sensing principle of the accelerometer are well illustrated. Then, the structural parameters are numerically studied. In experiment, the measured resonant frequency is 700 Hz, and the stable working frequency range is 50 ~ 400 Hz with an average sensitivity of 57.4 pm/g. The wavelength shift of FBG is linearly related to the acceleration with linearity better than 99.9%. Moreover, temperature effect on the accelerometer is also tested. The accelerometer exhibits good dynamic performance, as well as the advantages of compact structure and easy manufacturing, making it a candidate for vibration measurement. © 2021 Elsevier Inc.
Number of references: 24
Main heading: Accelerometers
Controlled terms: Fiber Bragg gratings - Natural frequencies - Temperature
Uncontrolled terms: Average sensitivities - Compact structures - Dynamic performance - Fiber bragg grating accelerometer - Sensing principle - Structural parameter - Symmetrical structure - Working frequency
Classification code: 641.1 Thermodynamics - 943.1 Mechanical Instruments
Numerical data indexing: Frequency 5.00e+01Hz to 4.00e+02Hz, Frequency 7.00e+02Hz, Percentage 9.99e+01%
DOI: 10.1016/j.yofte.2021.102649
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158. Temperature-Dependent Electrical Properties of nMOSFETs with Different Thickness AlO Capping Layer and TiN Gate

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Authors: Wang, Danghui (1); Zheng, Junna (1); Zhang, Yang (1); Xu, Tianhan (1); Simoen, Eddy (2, 4); Govoreanu, Bogdan (2); Claeys, Cor (3)
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Corresponding author: Wang, Danghui(dhwang@xsyu.edu.cn)
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CODEN: IETDAI
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In this article, the electrical properties of nMOSFET devices with different high-kAl2O3 capping layer thickness and TiN electrode have been systematically studied at deep cryogenic temperatures ranging from 10 to 300 K. The threshold voltageV TH, transconductanceg_m, carrier mobilitymu , mobility attenuation factortheta , and subthreshold swing (SS) are extracted using theI DS-V GScurves and Y-function method at different temperatures. It is indicated that: 1) all the electrical parameters (V TH,g_m,mu ,theta , and SS) show strong temperature dependence in the range of studied temperatures and 2) temperature-dependent electrical properties of nMOSFET devices will modulate at various cryogenic temperatures ascribed to the presence of the Al2O3 capping layer on the SiO2 dielectric layer, which increases the oxide trap density and consequentially adjusts the threshold voltage and mobility of the devices. © 1963-2012 IEEE.
Number of references: 35
Main heading: Aluminum oxide
Controlled terms: Cryogenics - Temperature distribution - Threshold voltage - Titanium nitride - MOSFET devices - Silica - Tin - Electrodes - Alumina
Uncontrolled terms: Al - Capping layer - High-k dielectric materials - MOS-FET - MOSFETs - O - Temperature dependence - Temperature dependent - TiN electrode. - TiN electrodes
Classification code: 546.2 Tin and Alloys - 641.1 Thermodynamics - 644.4 Cryogenics - 701.1 Electricity: Basic Concepts and Phenomena - 714.2 Semiconductor Devices and Integrated Circuits - 804.2 Inorganic Compounds
Numerical data indexing: Temperature 1.00E+01K to 3.00E+02K
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Compendex references: YES
Database: Compendex
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159. New numerical algorithm for the periodic boundary condition for predicting the coefficients of thermal expansion of composites

Accession number: 20210209743847
Authors: Tian, Wenlong (1); Chao, Xujiang (2); Fu, M.W. (3); Qi, Lehua (1); Ju, Luyan (4)
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Corresponding author: Fu, M.W.(mmmwfu@polyu.edu.hk)
Source title: Mechanics of Materials
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ISSN: 01676636
CODEN: MSMSD3
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In this paper, a new algorithm for the periodic boundary condition used for numerically predicting the coefficients of thermal expansion (CTEs) of different composite systems based on the finite element homogenization method is proposed. The results demonstrate that the proposed algorithm guarantees stress and strain continuities on the opposite surfaces of the representative volume elements (RVEs) for composites with spherical particles and

plain woven fabrics but not for composites with cylindrical fibers and three-dimensional four-directional braided yarns. Meanwhile, the proposed algorithm ensures the micro–macro energy balance (Hill's lemma) and the zero macro-stress constraint of the RVEs for all composite systems. Through the comparison with experimental tests and other numerical methods, the proposed algorithm is validated to be capable of accurately predicting the CTEs of composites. © 2021 Elsevier Ltd
Number of references: 29
Main heading: Boundary conditions
Controlled terms: Finite element method - Numerical methods - Homogenization method - Forecasting - Thermal expansion - Weaving
Uncontrolled terms: Coefficients of thermal expansions - Cylindrical fibers - Finite element homogenization method - Numerical algorithms - Periodic boundary conditions - Plain woven fabrics - Representative volume element (RVE) - Spherical particle
Classification code: 641.1 Thermodynamics - 819.5 Textile Products and Processing - 921 Mathematics - 921.6 Numerical Methods - 951 Materials Science
DOI: 10.1016/j.mechmat.2020.103737
Funding Details: Number: 2020CGHJ-011,51821091,51905426,51972271, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 1-YW3H, Acronym: PolyU, Sponsor: Hong Kong Polytechnic University;
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160. Self-Heating Effect Model for Vacuum Gate Dielectric Field-Effect Transistors

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Title of translation:
Authors: Su, Yali (1); Lai, Junhua (2); Qian, Junjie (2); Ye, Yuxin (3); Zhang, Guohe (2)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Microelectronics, Xi'an Jiaotong University, Xi'an; 710049, China; (3) Institute of Microelectronics of Chinese Academy of Sciences, Beijing; 100029, China
Corresponding author: Zhang, Guohe
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Document type: Journal article (JA)
Publisher: Xi'an Jiaotong University
Abstract: A self-heating effect model for vacuum gate dielectric vertical-stacked silicon nanowires (SiNWs) gate-all-around field-effect transistors (GAA FETs) considering scale effect is proposed to address intensified influences of thermal transport scale effect on self-heating effect in nanoscale MOSFETs. Firstly, the relationships between phonon scattering free paths in silicon film and SiNW are analyzed, and the SiNW thermal conductivity attenuation factor used to measure the revealing phonon boundary scattering is quantified. Then an analytical model of the thermal conductivity of SiNW considering the influence of scale effect is derived based on the current international analytical model for nanoscale silicon films. Finally, the self-heating effect model considering the scale effect is established for GAA SiNWs FET by combining with the critical path of heat transfer in nanoscale devices. The proposed model is used to realize numerical simulation of the self-heating effect of GAA SiNWs FET in TCAD software. Simulation results show that the vacuum gate dielectric with low thermal conductivity, vertical stacked multiple heat sources and thermal transport scale effect lead to more complex heat generation and diffusion processes in vacuum gate dielectric GAA SiNWs FET, and aggravate the self-heating effect of devices. The thermal transport capacity of gate can be maximized through the compromise design between vacuum gate gap and surrounding gas pressure and the self-heating effect of the device can be inhibited to improve the performance and reliability of device. Compared with the hot spot temperature estimated by the traditional self-heating effect model, the hot spot temperature in the vacuum

gate device predicted by the proposed model increases by 30%, indicating that the proposed model can effectively reveal the thermal transport scale effect of SiNW in GAA FET. © 2021, Editorial Office of Journal of Xi'an Jiaotong University. All right reserved.
Number of references: 20
Main heading: Silicon
Controlled terms: Analytical models - Metallic films - Computer software - Gate dielectrics - MOSFET devices - Heating - Nanowires - Phonons - Silicon compounds - Thermal conductivity
Uncontrolled terms: Attenuation factors - Compromise designs - Hotspot temperature - Low thermal conductivity - Multiple heat sources - Performance and reliabilities - Phonon-boundary scattering - Self-heating effect
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 641.1 Thermodynamics - 714.2 Semiconductor Devices and Integrated Circuits - 723 Computer Software, Data Handling and Applications - 761 Nanotechnology - 921 Mathematics - 933 Solid State Physics
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Database: Compendex
Data Provider: Engineering Village
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161. Some Results of Derivations on FI-lattices

Accession number: 20213910938557
Authors: Wang, Mei (1); Qian, Ting (2); Wang, Jun Tao (2)
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Corresponding author: Wang, Mei
Source title: IAENG International Journal of Computer Science
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Volume: 48
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Issue date: 2021
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Pages: 1-5
Language: English
ISSN: 1819656X
E-ISSN: 18199224
Document type: Journal article (JA)
Publisher: International Association of Engineers
Abstract: In this paper, we further study implicative derivations on FI-lattices and obtain some new results of them. In particular, we prove that the set of all implicative derivations on FI-lattice forms a monoid. Also, we generalize the implicative derivations by homomorphism, which is called generalized implicative derivation, on FI-lattices and obtain some important results of them. The results of this paper generalize the corresponding results of derivations on the logical algebras of t-norm based fuzzy logic. © 2021. All Rights Reserved.
Number of references: 35
Main heading: Algebra
Controlled terms: Fuzzy logic
Uncontrolled terms: (generalized) implicative derivation - FI-lattice - Fuzzy-Logic - Lattice form - Logical algebra - New results - T - Norm
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162. A Frequency Spectrum Calibration Detection Method for Motor Air Gap Fault

Accession number: 20220911726869
Authors: Gao, Ya (1); Gao, Yi (2); Zhu, Qinling (3); Li, Bo (4)
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Conference code: 176415
Sponsor: Beijing Institute of Control Robotics and Intelligent Technology (BICRI); Guangdong Ocean University; IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In this paper, aiming at the problem of inaccurate judgment of air gap fault detection results of asynchronous motors of different models, powers and manufacturers, a coordinate parameter correction and spectrum parameter processing method in the process of motor diagnosis is designed. In the coordinate parameter correction method, three-phase current signals are used for FFT transformation, and the corresponding current efficiency is converted according to the set current sensor range. Averaging, taking the three-phase current and the average value as the data source of sector division, dividing and calculating the coordinate parameters of the three-phase current and the average value according to the sector, and obtaining four coordinate reference parameters used as the motor fault diagnosis evaluation standard; According to the different content of fault feature information in different frequency sections, the spectral parameter processing method compresses the information according to different resolutions, extracts its symmetry information and absolute value information, reprocesses the information by using different excitation functions, adds probability parameters, normalizes the spectral information in different sections, and finally obtains the maximum parameter as a dimension in fault diagnosis evaluation by using 1-norm excitation function. This method increases the evaluation dimension in the evaluation mechanism of motor air gap fault diagnosis, improves the evaluation system and improves the accuracy of diagnosis. The method solves the problems that the traditional motor air gap fault detection method has inaccurate evaluation results in different motors and is not uniform in different loads.
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Number of references: 11
Main heading: Failure analysis
Controlled terms: Fault detection - Efficiency - Spectrum analysis - Induction motors - Function evaluation
Uncontrolled terms: Coordinate transformations - Current efficiency - Detection methods - Faults detection - Faults diagnosis - Motor air gap - Parameter correction - Parameters calibrations - Spectra analysis - Three-phase currents
Classification code: 705.3.1 AC Motors - 913.1 Production Engineering - 921.6 Numerical Methods
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163. Fluid-solid-thermal coupling analysis of rock failure under the joint action of cutting and jet impingement

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Authors: Dai, Xianwei (1); Huang, Zhongwei (2); Wu, Xiaoguang (2); Zhao, Heqian (2); Shi, Huaizhong (2)
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Corresponding author: Huang, Zhongwei(huangzw@cup.edu.cn)
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Publisher: Elsevier Ltd
Abstract: Mechanical cutting assisted by high-pressure jet is a common and efficient drilling method in the exploration of hot dry rock (HDR). The drilling efficiency can be further improved with an in-depth understanding in the rock-breaking mechanism, which is a complex process involving the coupling of thermal stress, jet impact pressure and cutting force. To address such a multi-physics coupling issue, a loosely coupling method was adopted in this work to accomplish the exchange of data, including temperature, heat flux, nodes deformation and impinging pressure of jet in every time increment. In the fluid subdomain, the liquid nitrogen (LN2) jet and water jet were modeled and compared to demonstrate the potential of the novel jet in improving the drilling rate. In the solid subdomain, cutting force monitored in the experiment was loaded, and the concrete damage plastic model was employed to evaluate damage behaviors of the rock. Relative experiments were conducted to validate the reliability of simulation results. Results indicate that a great temperature difference develops on the coupling surface under the impingement of LN2 jet due to its cryogenic feature and lower heat transfer efficiency. Thereby, irreversible damage of the rock can be induced even at room temperature (298 K). As for the water jet, tensile damage is not observed until the rock temperature increases to 473 K. The assistance of jet impact on rock breaking is mainly reflected in two aspects: (1) the occurrence of tensile damage on the coupling surface facilitates the subsequent rock cutting; (2) the enhancement of tensile damage around the cutter promotes the initiation of cracks. Higher rock temperatures significantly improve the heat transfer rate and enhance the advantage of jet assistance. The present study can provide a new sight for the exploration of HDR. © 2021 Elsevier Ltd
Number of references: 40
Main heading: Rocks
Controlled terms: Cutting - Efficiency - Failure (mechanical) - Heat flux - Heat transfer - Infill drilling - Jets - Liquefied gases - Thermal stress
Uncontrolled terms: Cutting forces - Fluid solids - Hot dry rock - Jet impacts - Jets impinging - Multi-physics couplings - Rock damage - Rock temperatures - Tensile damage - Waterjets
Classification code: 511.1 Oil Field Production Operations - 631.1 Fluid Flow, General - 641.2 Heat Transfer - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Temperature 2.98E+02K, Temperature 4.73E+02K
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Funding Details: Number: BJJWZYJH01201911414038, Acronym: -, Sponsor: -; Number: KFJJ-TZ-2019-5, Acronym: -, Sponsor: -; Number: 51725404, Acronym: -, Sponsor: National Science Fund for Distinguished Young Scholars;
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164. Ultra-broadband, near-perfect and thin-film scale solar absorber based on semiconductor-metal nanocone

Accession number: 20213510823907
Authors: Jiang, Jiabao (1); Xu, Yiping (1); Li, Yuhui (1); Ren, Liyong (2); Chen, Fang (1); Cheng, Shubo (1); yang, Wenxing (1); Ma, Chengju (3); Wang, Ziyi (1); Zhou, Xianwen (1)

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Corresponding author: Xu, Yiping(ypxu@yangtzeu.edu.cn)
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Document type: Journal article (JA)
Publisher: Elsevier GmbH
Abstract: In this paper, a solar energy absorber consisting of a periodic array of GaAs-Ti disks placed on the surface of a metal substrate tungsten (W) is proposed to realize the ultra-wideband, near-perfect absorption. The absorption characteristics of the absorber are investigated theoretically by using of the finite-difference time-domain method (FDTD). The researched results indicate that the absorption bandwidth with the absorption rate of over 90% exceeds 3400 nm, which is wider than that of the advanced solar energy absorption reported previously. The average absorption rate of this absorber at this bandwidth is up to 96.2%. The solar spectral weighted absorption efficiency η reaches 96.1%, and the ratio of the missed energy γ drops to 0.039. What's more, the absorption performance of the absorber with different parameters, structures and materials is investigated systematically to determine the best absorption performance. The researched results discovery that propagating surface plasmons (PSPs), cavity modes, guided mode resonances (GMRs), localized surface plasmons (LSPs), plasmonic coupling and their synergy are excited to achieve the ultra-broadband and near-perfect absorption in visible and infrared wavelengths. It also has the characteristics of independent incident and polarization angles. These excellent properties and attractive findings demonstrate that the proposed solar absorber has more extensive applications in the field of energy collection and energy conversion. © 2021 Elsevier GmbH
Number of references: 41
Main heading: Solar absorbers
Controlled terms: Solar energy - Ultra-wideband (UWB) - Finite difference time domain method - Gallium arsenide - Nanocrystals - Substrates - Absorption efficiency - Energy conversion - III-V semiconductors - Plasmonics - Bandwidth - Guided electromagnetic wave propagation - Surface plasmons
Uncontrolled terms: Absorption performance - Absorption rates - Energy - Guided-mode resonance - Localized surface plasmon - Perfect solar absorber - Propagating surface plasmons - Semiconductor metals - Thin-films - Ultra-broadband
Classification code: 525.5 Energy Conversion Issues - 657.1 Solar Energy and Phenomena - 711.1 Electromagnetic Waves in Different Media - 712.1 Semiconducting Materials - 716.1 Information Theory and Signal Processing - 716.3 Radio Systems and Equipment - 761 Nanotechnology - 804 Chemical Products Generally - 813.2 Coating Materials - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 932.3 Plasma Physics - 933.1 Crystalline Solids
Numerical data indexing: Percentage 9.00E+01%, Percentage 9.61E+01%, Percentage 9.62E+01%, Size 3.40E-06m
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Funding Details: Number: 801080010128, Acronym: -, Sponsor: -; Number: 2020KJRC0013, Acronym: -, Sponsor: -; Number: 11904032,2016CFC767,61535015,61605018, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported in part by the National Natural Science Foundation of China (NSFC) (61605018 , 61535015 , 11904032), the Xi'an Scientific and Technological Projects (2020KJRC0013), the Hubei Natural Science Foundation of China (2016CFC767), the Doctoral Scientific Research Startup Foundation of Yangtze University (801080010128).
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165. A novel strain sensor using a fiber taper cascaded with an air bubble based on fabry-perot interferometer

Accession number: 20210509840637
Authors: Gang, Ting Ting (1); Tong, Rong Xin (2); Bian, Ce (3)

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Corresponding author: Gang, Ting Ting(tingtinggang1@163.com)
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Article number: 9234489
Language: English
ISSN: 1530437X
E-ISSN: 15581748
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: A novel optical fiber strain sensor based on a Fabry-Perot Interferometer (FPI) is proposed and experimentally demonstrated. The FPI is fabricated by splicing a single mode fiber (SMF) taper and an air micro-bubble formed by using repeated discharging on the hollow core fiber (HCF). By doing this, the sensitivity of the proposed configuration to strain is greatly increased comparing with that of other FPIs. Experimental results show that the sensitivity of the sensor to strain can reach 41.5 pm/μ, 42.56 pm/μand 41.02 pm/μat the dips of 1525.9721 nm, 1646.3134 nm and 1567.1797 nm, respectively with negligible power fluctuation. And average sensitivity at three resonance peaks to temperature is 2.04 pm/°C resulting the temperature cross sensitivity of 0.0489μ/°C. In addition, the proposed sensor shows good performances in the repeatability and stability, which can be potentially used in the many fields such as medical treatment and structural health monitoring. © 2001-2012 IEEE.
Number of references: 19
Main heading: Single mode fibers
Controlled terms: Structural health monitoring - Fabry-Perot interferometers - Optical fiber fabrication
Uncontrolled terms: Average sensitivities - Fiber strain sensors - Hollow core fiber - Medical treatment - Novel strains - Power fluctuations - Resonance peak - Temperature cross-sensitivity
Classification code: 422 Strength of Building Materials; Test Equipment and Methods - 741.1.2 Fiber Optics - 941.3 Optical Instruments
Numerical data indexing: Size 1.53e-06m, Size 1.57e-06m, Size 1.65e-06m
DOI: 10.1109/JSEN.2020.3032611
Compendex references: YES
Database: Compendex
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166. Efficient preparation of nano-starch particles and its mechanism of enhanced oil recovery in low-permeability oil reservoirs

Accession number: 20212910657273
Authors: Zhang, Lei (1, 2, 3); Jing, Cheng (3); Khan, Nasir (4); He, Yanlong (3); Gu, Xiaoyu (3); Zheng, Liming (5)
Author affiliation: (1) China University of Geosciences, Wuhan, China; (2) Xi'an Key Laboratory of Tight Oil (Shale Oil) Development, China; (3) Xi'an Shiyou University, China; (4) Balochistan University of Information Technology, Engineering and Management Sciences, Pakistan; (5) Yanshan University, China
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ISSN: 1086055X
CODEN: SPJRFW
Document type: Journal article (JA)
Publisher: Society of Petroleum Engineers (SPE)

Abstract: As development of low-permeability oil reservoirs continues to increase, it urgently needs an efficient enhanced oil recovery (EOR) technology to adapt to the new situation and requirement of oilfield exploitation. Although the application of nanomaterials for the EOR of low-permeability oil reservoirs has initially obtained good results, the types of currently used nanomaterials in the field of EOR are limited, and the mechanism of EOR is still unclear. In this paper, a type of nanosized starch particle is efficiently prepared using the method of precipitation with the help of ultrasonic oscillation. Under ultrasonic oscillation, the viscosity of starch paste can be significantly decreased, which is beneficial for the precipitation of starch nanoparticles. After ultrasonic oscillation, the size of the developed nanoparticles is smaller and controlled during the precipitation of starch paste using ethanol as the precipitating agent. The developed nanosized starch particles are suitable for the lowpermeability oil reservoirs with low-salinity water. Subsequently, the mechanism of EOR of the developed nanosized starch particles is systematically studied through laboratory experiments. In addition to changing the wettability of rock surface and decreasing oil/water interfacial tension (IFT), the nanosized starch particles can effectively change the motion state of water molecules and cause the change of the structure of water molecules. In the low-permeability core, the displacement front of the nanosized starch solution is uniform, and the sweep volume of the nanosized starch solution flooding is large. Because of a higher sweep volume and a smaller adsorption loss, nanosized starch solution flooding can achieve a better effect of oil recovery than surfactant flooding in 30m of low-permeability porous medium. The conclusions can provide a new guidance for EOR technology to support the efficient development of low-permeability oil reservoirs. © 2021 Society of Petroleum Engineers.
Number of references: 72
Main heading: Starch
Controlled terms: Nanostructured materials - Porous materials - Enhanced recovery - Mechanical permeability - Petroleum reservoir engineering - Oil well flooding - Molecules - Low permeability reservoirs - Nanoparticles - Floods - Precipitation (chemical)
Uncontrolled terms: Enhanced oil recovery - Laboratory experiments - Low permeability oil - Oilfield exploitation - Precipitating agents - Starch nanoparticles - Structure of waters - Ultrasonic oscillations
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 761 Nanotechnology - 802.3 Chemical Operations - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 931.3 Atomic and Molecular Physics - 933 Solid State Physics - 933.1 Crystalline Solids - 951 Materials Science
Numerical data indexing: Size 3.00e+01m
DOI: 10.2118/203831-PA
Funding Details: Number: 51804256,51874240, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JQ5208,2019JQ-287,2020JQ-787,2020KW-027, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: CUG 180612,XSTS-202004, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This study was supported by the Fundamental Research Funds for the Central Universities (CUG 180612), the Open Fund (XSTS-202004) of Xi'an Key Laboratory of Tight Oil (Shale Oil) Development, the National Natural Science Foundation of China (Grants 51804256 and 51874240), and Natural Science Basic Research Plan in Shaanxi Province of China (Grants 2020KW-027, 2018JQ5208, 2019JQ-287, and 2020JQ-787). Because of the COVID-19 pandemic in Wuhan City, the supplementary experiments in the revised manuscript were done at Xi'an University of Petroleum in China. We thank Prof. Hai Huang from Xi'an Shiyou University for providing the equipment of 30-m sand-filled pipe displacement experiments.
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167. Research Progress of Sludge Pyrolysis Catalysts (*Open Access*)

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Authors: Han, Lei (1); Chong, Faguo (2); Guo, Zhiqiang (2); Wang, Chao (2); Wu, Zhibin (2); Yu, Tao (1); Qu, Chengtun (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'An Shiyou University, Shaanxi Oil and Gas Pollution Control, Reservoir Protection Key Laboratory, Xi'an; 710065, China; (2) Xi'An Changqing Science and Technology Engineering Co. LTD, China
Corresponding author: Qu, Chengtun(Wangshuangct@yeah.net)
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Publication year: 2021
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Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Green Energy and Sustainable Development, GESD 2020
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Conference location: Shenyang City, Virtual, China
Conference code: 167246
Sponsor: CCCC Second Harbour Engineering Company Ltd.; Chishun Chemical; Wanxiang Group Technology Center
Publisher: IOP Publishing Ltd
Abstract: Sludge treatment has become one of the most important challenges in environmental protection. With the improvement of sludge treatment standards, the environmentally-friendly and efficient pyrolysis technology developed has a good development prospect. The addition of catalyst is one of the important conditions affecting sludge pyrolysis. This paper introduces the influence of different kinds of catalysts on pyrolysis, and summarizes their advantages and disadvantages. © Published under licence by IOP Publishing Ltd.
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Main heading: Pyrolysis
Controlled terms: Catalysts
Uncontrolled terms: Development prospects - Sludge treatment
Classification code: 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
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168. Study on grooving corrosion behavior of QT800 coiled tubing (*Open Access*)

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Authors: Yan, Fengxia (1, 2); Li, Zili (1); Zhang, Cheng (3); Wang, Heqin (3)
Author affiliation: (1) College of Pipeline and Civil Engineering, China University of Petroleum, Qingdao; 266580, China; (2) College of Petroleum Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (3) Puguang Branch of Zhongyuan Oilfield, Puyang; 457001, China
Corresponding author: Yan, Fengxia(yqcyyan@163.com)
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Language: English
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Document type: Journal article (JA)
Publisher: American Institute of Physics Inc.
Abstract: The characteristics of grooving corrosion at a welding seam of QT800 coiled tubing were investigated under different conditions by using the conventional immersion test and constant potential accelerated corrosion test, respectively. The results showed that the sensitivity of grooving corrosion of the welded tube, represented by the grooving corrosion factor, was within the acceptable range even after the long-term immersion test. The reasons of the grooving corrosion were analyzed from the microstructure and electrochemical performance of the weld. Compared with the matrix and the heat-affected zone, the fusion line had coarse grains, large corrosion current, and low self-corrosion potential, which played a part in the main reason to induce the groove corrosion effect. © 2021 Author(s).

Number of references: 33
Main heading: Heat affected zone
Controlled terms: Corrosive effects - Seam welding
Uncontrolled terms: Accelerated corrosion tests - Constant Potential - Corrosion current - Corrosion effects - Corrosion potentials - Electrochemical performance - Grooving Corrosion - Long-term immersions
Classification code: 538.2 Welding - 538.2.1 Welding Processes - 539.1 Metals Corrosion
DOI: 10.1063/5.0044098
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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169. Preparation and Oxidation Characteristics of Micron Aluminum Powder Interface Structure Based on Focused Ion Beam

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Title of translation:
Authors: Wang, Jingkai (1, 2); Chen, Jie (2); Liu, Shuai (3); Sui, Heliang (2); Suo, Zhirong (1); Yin, Ying (1, 2)
Author affiliation: (1) School of Materials and Engineering, Southwest University of Science and Technology, Mianyang; 621010, China; (2) Institute of Chemical Materials, CAEP, Mianyang; 621999, China; (3) College of Sciences, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding authors: Suo, Zhirong(suozhirong@163.com); Yin, Ying(yinying93@163.com); Yin, Ying(yinying93@163.com)
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Language: Chinese
ISSN: 10069941
Document type: Journal article (JA)
Publisher: Institute of Chemical Materials, China Academy of Engineering Physics
Abstract: In order to study the interface structure of aluminum core/oxide layer intuitively, the slicing method of aluminum powders (2-8 μm) were successfully established based on FIB micro and nano processing technology. The slices were obtained by combining FIB direct cutting with profile thinning. The interface structure of the prepared slice samples was clear and intact, and the oxide layers were not damaged. The microstructure, crystallinity and element distribution of "Al core/oxide layer" under different ageing conditions were obtained were characterized by SEM, HRTEM and EDS. The stoichiometric ratio of Al and O elements in the oxide layer of aluminum particles deviated from the standard Al2O3, showing a gradient distribution. The positive correlation between the oxide layer thickness of aluminum particles and the aging temperature has been quantitatively obtained. The oxide layer thickness of the samples without thermal aging was about 5.4 nm, and the oxide layer thickness of the samples aged at 75 and 95 increased to (34.1±2.1) nm and (51.3±2.2) nm, respectively. © 2021, Editorial Board of Chinese Journal of Energetic Materials. All right reserved.
Number of references: 20
Main heading: High resolution transmission electron microscopy
Controlled terms: Aluminum oxide - Alumina - Ion beams - Thermal aging - Crystallinity
Uncontrolled terms: Focused ions beams - Gradient distributions - High-resolution transmission electron microscopy - Micro aluminum - Micro nano processing technology - Micro/nano - Nanoprocessing - Oxide layer - Oxide layer thickness - Processing technologies
Classification code: 741.3 Optical Devices and Systems - 804.2 Inorganic Compounds - 932.1 High Energy Physics - 933.1 Crystalline Solids - 951 Materials Science
Numerical data indexing: Size 5.40E-09m
DOI: 10.11943/CJEM2020323
Compendex references: YES
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170. Synthesis and Surface Properties of Novel Quaternary Ammonium Gemini Surfactants with Polar Head Groups Containing 2-Hydroxypropyl Moieties

Accession number: 20210609884674
Authors: Bai, Yun (1); Pu, Chunsheng (1); Liu, Shuai (1); Gao, Xiang (1); Chen, Gang (2)
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Source title: Journal of Surfactants and Detergents
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Language: English
ISSN: 10973958
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CODEN: JSDEFL
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: The purpose of this paper is to comprehend in-depth the effect of the surfactant structure on its and physicochemical properties such as surface/interfacial properties, foam stability, wettability, and biodegradability. To this end, quaternary ammonium Gemini surfactants, alkanediyl-α,ω-bis[(2-hydroxypropyl)dodecylammonium] dibromide (abbreviated as Cm-n-Cm[iso-Pr(OH)]2 with m = 12, 14 and n = 2, 3, 4) were synthesized via substitution and quaternization reactions, and their chemical structures were characterized by Fourier transform infrared (FT-IR) and nuclear magnetic resonance (1HNMR) spectroscopies. The results showed that with the decrease of the spacer length, the surface tension was reduced more strongly, and with the increase of the alkyl tail length, micelles were more easily formed. Besides, the highest surface activity of C14-2-C14[iso-Pr(OH)]2 was observed by increasing NaCl concentration to 200 g L-1. The temperature had a great influence on thermodynamic parameters of the adsorption and micellization. The interfacial tension between 0.26 g L-1 C14-2-C14[iso-Pr(OH)]2 solution and oil could reach 0.022 mN m-1. An elongation of the spacer chain in C14-n-C14[iso-Pr(OH)]2 was unfavorable to foam stability. Besides, the oil-wetted core, which was aged in 0.6 g L-1 C14-2-C14[iso-Pr(OH)]2 solution, exhibited more hydrophilicity. Cm-n-Cm[iso-Pr(OH)]2 surfactants produced higher biodegradable rates in river water ($\geq$ 90% after 28 days) than the biodegradable surfactant of international recommendation (71% after 28 days) at 30 °C. © 2021 AOCS
Number of references: 23
Main heading: Wetting
Controlled terms: Surface properties - Physicochemical properties - Biodegradability - Dyes - Nuclear magnetic resonance spectroscopy - Cationic surfactants - Micelles - Sodium chloride
Uncontrolled terms: Fourier transform infrared - Gemini surfactant - NaCl concentration - Quaternary ammonium - Quaternization reaction - Surface activities - Surfactant structure - Thermodynamic parameter
Classification code: 801.2 Biochemistry - 801.3 Colloid Chemistry - 801.4 Physical Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Age 7.67e-02yr, Percentage 7.10e+01%, Percentage 9.00e+01%, Temperature 3.03e+02K
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171. Numerical study of displacement current phase tomography for gas-water two-phase flow (*Open Access*)

Accession number: 20212110398146
Authors: Wang, Xiaoxin (1); Chen, Yangzheng (1); Wang, Bo (2); Dang, Ruirong (1)
Author affiliation: (1) Key Laboratory of Education Ministry for Photoelectric Logging and Detecting of Oil and Gas, Xi'An Shiyou University, Xi'an, China; (2) Xi'An Research Institute Co. Ltd., China Coal Technology and Engineering Group Corp., Xi'an, China
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: Electrical Tomography technology is widely used in the research and engineering practice of two-phase flow due to its advantages of non-radiation, non-intrusive and simple equipment structure. However, because of the electrical tomography sensitive field distribution of medium nonlinear (soft), the reconstructed images are often distorted, especially when faced with high conductivity and high dielectric constant two-phase flow (such as oil-field water of high salinity). Displacement current phase tomography (DCPT) is a new electrical tomography technology and it is proposed in 2017. An attractive feature of DCPT is that the relationship between the measured phase and the loss factor has a more extended linear range than the relationship between the measured capacitances in ECT and the permittivity distribution. In this paper, a 12-electrod DCPT with Landweber reconstruction algorithm is applied for gas-water two-phase flow imaging, and the reconstruction results are compared with electrical capacitance tomography (ECT) by numerical examples. © Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Two phase flow
Controlled terms: Image reconstruction - Electric impedance tomography - Oil fields - Capacitance
Uncontrolled terms: Displacement currents - Electrical Capacitance Tomography - Electrical tomography - Engineering practices - High dielectric constants - Permittivity distributions - Reconstructed image - Reconstruction algorithms
Classification code: 512.1.1 Oil Fields - 631.1 Fluid Flow, General - 701.1 Electricity: Basic Concepts and Phenomena
DOI: 10.1088/1742-6596/1894/1/012095
Funding Details: Number: YCS18211003, Acronym: -, Sponsor: -; Number: 41874158, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-822, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
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172. Systematic evaluation of abnormal detection methods on gas well sensor data

Accession number: 20220411506565
Authors: Tang, Xichen (1); Wang, Jinlong (1); Zhu, Ye (2); Doss, Robin (2); Han, Xin (3)

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Conference name: 26th IEEE Symposium on Computers and Communications, ISCC 2021
Conference date: September 5, 2021 - September 8, 2021
Conference location: Athens, Greece
Conference code: 175523
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Natural gas, as a kind of clean energy, has attracted significant attention in the global market. However, how to ensure the safety and high efficiency in natural gas production becomes a hot research problem in the gas industry. The real-time abnormal status detection of the natural gas well empowers the decision-maker to prevent potentially catastrophic damage and correct unexpected situations. In this paper, we systematically evaluate the 9 state-of-the-art machine learning methods to detect such anomalous status on large sensor data collected from 4 natural gas wells. In addition, we have identified the most important features that can improve anomaly detection performance. The challenges and potential research directions have been discussed. This is the first work to investigate different types of anomaly detection methods on natural gas well sensor data. Our research results provide valuable insights for developing specific anomaly detection systems in the natural gas industry. © 2021 IEEE.
Number of references: 20
Main heading: Gases
Controlled terms: Gas industry - Natural gas - Accident prevention - Anomaly detection - Damage detection - International trade - Learning systems - Decision making - Natural gas wells - Natural gas well production
Uncontrolled terms: Abnormal detection - Anomaly detection - Clean energy - Detection methods - Gas well - Global market - Safety and high efficiencies - Sensors data - Systematic evaluation - Times series
Classification code: 512.2.1 Natural Gas Fields - 522 Gas Fuels - 912.2 Management - 914.1 Accidents and Accident Prevention
DOI: 10.1109/ISCC53001.2021.9631508
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Funding text: We thank The No.1 Gas Production Plant of PetroChina Changqing Oilfield Company for providing the labelled datasets collected from four natural gas wells.We thank The No.1 Gas Production Plant of PetroChina Changqing Oilfield Company for providing the labelled datasets collected from four natural gas wells. This research is partially supported by the National Natural Science Fund of China (Project No. 71871090). This research is supported by the Key Research and Development Foundation of Shandong Province of China (No. 2019GGX101017).
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173. A consistent sharp interface fictitious domain method for moving boundary problems with arbitrarily polyhedral mesh

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Authors: Chai, Guoliang (1); Wang, Le (2); Gu, Zhaolin (1); Yu, Chunlei (3); Zhang, Yigen (3); Shu, Qinglin (3); Su, Junwei (1)
Author affiliation: (1) School of Human Settlement and Civil Engineering, Xi'an Jiaotong University, Xi'an, China; (2) Mechanical Engineering College, Xi'an Shiyou University, Xi'an, China; (3) Research Institute of Exploration and Development, Shengli Oilfield Company, Sinopec group, Dongying, China
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E-ISSN: 10970363
CODEN: IJNFDW
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: A consistent, sharp interface fully Eulerian fictitious domain method is proposed in this article for moving boundary problems. In this method, a collocated finite volume method is used for the continuous phase; a geometry intersection method is employed for numerical integrals over the solid domain and transport of the body force; the pseudo body force defined at "solid centers" ensures the algorithm consists of the body force between the continuous form and its discretization counterpart; an explicit flux correction on cell faces and resulting mass source is introduced into the continuity equation to lower noncontinuity errors in the velocity correction step. This method is valid for stationary and moving boundary problems with arbitrarily polyhedral mesh. Several numerical tests are carried out to validate the proposed method. A second-order spatial accuracy is found in the flow around a cylinder case, and the spurious force oscillation is well suppressed for the in-line oscillation of a circular cylinder case. The performances on different meshes are tested, and structured mesh yields the best result, polyhedral next, and tetrahedral worst. A serial of tests is further performed on structured mesh to verify the effect of three different features (i.e., storing the body force at the solid centers, flux correction, and whether including the body force in the momentum equation) on the numerical predictions. Numerical results show that, in the in-line oscillation of a circular cylinder, "flux correction" can eliminate the large spikes in the drag coefficient, and "including the body force in the momentum equation" helps suppress the small oscillations. For other tests, "storing the body force at the solid centers" has enormous impacts on the final results of moving boundary problems, "flux correction" has little effects and the necessity of "including the body force in the momentum equation" is case dependent. © 2021 John Wiley & Sons Ltd.
Number of references: 55
Main heading: Circular cylinders
Controlled terms: Oscillating cylinders - Oscillating flow - Numerical methods - Finite volume method - Mesh generation - Momentum
Uncontrolled terms: Collocated finite volume methods - Continuity equations - Fictitious domain method - Flow around a cylinder - In-line oscillations - Intersection method - Moving boundary problems - Numerical predictions
Classification code: 601.1 Mechanical Devices - 631.1 Fluid Flow, General - 723.5 Computer Applications - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods - 931.1 Mechanics
DOI: 10.1002/fld.4965
Funding Details: Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 21306145, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: information National Major Science and Technology Projects of China, 2016ZX05011001; National Natural Science Foundation of China, 21306145This work is supported by the National Major Science and Technology Projects of China (No. 2016ZX05011001) and the National Natural Science Foundation of China (No. 21306145).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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174. In Situ Depositing Ag NPs on PDA/SiW11V Co-encapsulated Fe3O4@TiO2 Magnetic Microspheres as Highly Efficient and Durable Visible-light-driven Photocatalysts

Accession number: 20204809554975
Authors: Wu, Panfeng (1, 2); Xue, Qi (3); Liu, Jiquan (2); Wang, Tianyu (2); Feng, Caiting (2); Liu, Bin (2); Hu, Huaiming (2); Xue, Ganglin (2)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University Yanta District, Xi'an; 710065, China; (2) College of Chemistry & Materials Science, Northwest University Guodu, Chang'an District, Xi'an; 710127, China; (3) Xi'an Modern Chemistry Research Institute, Xi'an; 710065, China
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Pages: 388-396
Language: English
ISSN: 18673880
E-ISSN: 18673899
CODEN: CHEMK3
Document type: Journal article (JA)
Publisher: Wiley Blackwell
Abstract: The design and preparation of highly efficient and durable visible-light-driven photocatalysts remain a great challenge in the environment remediation. In this paper, a new multi-component composite, Fe3O4@TiO2@PDA/SiW11V-Ag, is successfully fabricated by in situ assembling Ag nanoparticles (NPs) onto polydopamine (PDA) and mono-vanadium substituted silicotungstate (SiW11VO406-, simplified as SiW11V) co-encapsulated Fe3O4@TiO2 magnetic microspheres. In the photodegradation of methyl orange (MO) and photocatalytic reduction of Cr(VI) under visible light, the multi-component composite displays the enhanced catalytic efficiency in comparison with other catalysts with less-components. Structure-reactivity relationship is established based on the correlation between photocatalytic efficiency and transient photocurrent intensity. Notably, the multi-component composite exhibits high stability and durability in wide range of pH aqueous solutions and most of organic solvents. The successful preparation of this novel type of materials provides a promising approach for constructing stable photocatalysts with multi-components, where poor compatibility of each component can be well bridged via PDA as an efficient linker and charge transport. © 2020 Wiley-VCH GmbH
Number of references: 66
Main heading: Silver nanoparticles
Controlled terms: Silicon - Chromium compounds - Magnetite - Metal nanoparticles - Titanium dioxide - Azo dyes - Efficiency - Light - Microspheres - Photocatalytic activity - TiO2 nanoparticles
Uncontrolled terms: Ag nanoparticle - Catalytic efficiencies - Magnetic microspheres - Multicomponents - Photocatalytic efficiency - Structure-reactivity relationships - Transient photocurrents - Visible light driven photocatalysts
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 741.1 Light/Optics - 761 Nanotechnology - 801.4 Physical Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 913.1 Production Engineering
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Funding text: This research was supported by the National Natural Science Foundation of China (21673176).
Compendex references: YES
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175. Methods to Test the Compressive Strength of Earth Blocks (*Open Access*)

Accession number: 20213710889080
Authors: Lan, Guanqi (1); Chao, Sisi (2); Wang, Yihong (3); Cui, Ying (1)
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Corresponding author: Lan, Guanqi(201202@xsyu.edu.cn)
Source title: Advances in Materials Science and Engineering
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Issue date: 2021
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Article number: 1767238
Language: English
ISSN: 16878434
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Document type: Journal article (JA)
Publisher: Hindawi Limited

Abstract: The efficient design of new earth structures and the restoration of old structures both require a reliable assessment of the compressive strength of earth materials. However, there is still much debate on the best method to accurately measure the compressive strength of earth blocks. To solve the problem of measuring the compressive strength of the earth block, the cube specimen, the half-block stacked specimen, and the full-size block specimen are used to measure the compressive strength of the molded adobe and rammed adobe, respectively, considering the influence of the specimen preparation process, loading direction, capping, and other factors. By comparing and analyzing the stress state, failure mode, and compressive strength of the specimen under various test methods, a compressive strength test method of earth blocks is determined, which is simple to operate, easy to standardize, and as close as possible to the actual strength of the blocks. The results show that the full-size block compression test method along the block thickness direction should be preferred to test the compressive strength of the earth block. The standard specimen obtained by cutting the full-size block is not suitable for the test of the compressive strength of the earth block; it can effectively solve the problem that the compressive strength of the small-thickness earth block cannot be directly measured by cutting the full-size block in half and stacking it, but it is not recommended to use the binder to bond the two half-blocks. When comparing the compressive strength of the earth blocks, the conversion coefficient related to the height-to-thickness ratio of the specimen cannot be used to convert the compressive strength. Still, the anisotropy of the material strength should be considered. © 2021 Guanqi Lan et al.
Number of references: 29
Main heading: Compressive strength
Controlled terms: Compression testing
Uncontrolled terms: Compression test method - Conversion coefficients - Efficient designs - Loading direction - Material strength - Reliable assessment - Standard specimens - Thickness direction
Classification code: 951 Materials Science
DOI: 10.1155/2021/1767238
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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176. Numerical simulation of the relationship between resistivity and microscopic pore structure of sandstone (*Open Access*)

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Authors: Li, Yuteng (1); Zhao, Jiajia (1); Fao, Tao (1); Liu, Lei (1); Fang, Zhe (1); Tian, Xiaochao (1); Xiongwei, Qu (2, 3)
Author affiliation: (1) Xi'an Research Institute of China Coal Technology and Engineering Group, Xi'an, Shaanxi; 710077, China; (2) Shanxi Fenghuo Hongsheng ScienceandTechnology Co Ltd, Baoji, Shaanxi; 721006, China; (3) Xi'an Shiyou University, Xi'an, Shaanxi; 710065, China
Corresponding author: Li, Yuteng(liyuteng@cctegxian.com)
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Issue title: 2nd International Conference on Geology, Resources Exploration and Development
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Publication year: 2021
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Language: English
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Document type: Conference article (CA)
Conference name: 2021 2nd International Conference on Geology, Resources Exploration and Development, ICGRED 2021
Conference date: January 15, 2021 - January 17, 2021
Conference location: Zhuhai, Virtual, China
Conference code: 167520
Publisher: IOP Publishing Ltd
Abstract: The microscopic pore structure of the sandstone rock layer determines the water richness and permeability of the rock layer. Mastering the relationship between the resistivity of the sandstone rock layer and the microscopic

pore structure is an important way to evaluate the water richness of the water-bearing rock layer from qualitative analysis to quantitative calculation. Using the finite element method to study the basic single and double modal structures in the sandstone layer of constant current field, the matrix resistivity, pore throat water resistivity, pore shape and difference in single sand model, pore throat model and capillary model are studied. The relationship between the direction of the current and the resistivity of the rock layer. The results show that the resistivity of the sandstone rock layer changes with the change of the matrix resistivity and has a linear relationship. When the contrast ratio between the sand and the matrix resistivity is between 10-1 and 10, the resistivity of the rock layer changes linearly with the resistivity of the sand; when the contrast ratio is greater than 10, the influence of the resistivity of the matrix is smaller. And when the contrast is greater than 103, the resistivity of the rock layer tends to be constant; when the contrast is less than 10-2, the smaller the resistivity of the sand grains, the smaller the effect on the resistivity of the rock layer, and when the contrast is less than 10-3, the resistivity of the rock layer tends to constant. Since the water in the sandstone rock layer is the main conductive medium, when the water resistivity is fixed, the smaller the water saturation or the smaller the porosity, the smaller the pores through which water can flow and the greater the resistivity of the sandstone formation. When the microstructures of the horizontal and vertical rock layers are different, different transmitting and receiving electrode layouts have a greater impact on the resistivity of the rock layer, and the different microstructures lead to electrical anisotropy of the rock layer. The research results of this paper lay the foundation for the analysis of the relationship between the more complex sandstone rock model resistivity and micro-pore structure, and the quantitative calculation of the water richness of the sandstone rock layer. © Published under licence by IOP Publishing Ltd.
Number of references: 14
Main heading: Sandstone
Controlled terms: Aquifers - Sand - Pore structure
Uncontrolled terms: Electrical anisotropy - Linear relationships - Micro-pore structures - Microscopic pore structures - Qualitative analysis - Quantitative calculation - Sandstone formations - Water-bearing rocks
Classification code: 444.2 Groundwater - 482.2 Minerals - 483.1 Soils and Soil Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
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177. Simulation of temperature compensation for geometrical stability in large ring laser

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Authors: Zhang, Lisong (1, 2); Guo, Wenge (1, 2, 3); Yao, Lixun (1, 4); Zhai, Erjiang (1, 3); Liu, Shitong (1, 3); Wei, Mingming (1, 3); Wang, Xikang (1, 2); Yun, Enxue (1, 2); Gao, Yuping (1, 2); Zhang, Shougang (1, 2)
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Corresponding author: Guo, Wenge(wguo@ntsc.ac.cn)
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Publisher: SPIE
Abstract: Large ring laser gyros are regarded as suitable sensors for precise monitoring of the Earth's rotation. Their long-Term stability, high sensitivity, and mechanical properties suggest themselves for potential terrestrial deployment, such as Universal Time (UT1), Length of Days (LOD), Geophysics, etc. This inertial technology based on Sagnac interferometers measure any non-reciprocal effect which gives rise to a difference of optical path lengths between forward-propagating laser beams and the counter-propagating within the cavity. Differing from their cousins used in navigation, large ring lasers is usually a heterolithic optical cavity composed of four independent reflector components s to avoid employing large whole Zerodur. Comparing with other UT1 measuring technologies, large ring lasers has characteristics of higher resolution and good real-Time, which is highly complementary to VLBI observation technology. In order to meet the measurement of UT1 error less than 1ms/day to coordinate with VLBI, the resolution of ultra-stable laser gyros must be better than 10e-13rad/s. The geometric stability of heterolithic ring cavity is demanded stringently. We simulated the intrinsic relationship between geometric deformation and scale factor of optical cavity. The influence of temperature on geometric deformation has been analyzed and the temperature compensation strategy is proposed. The temperature field distribution of the laser gyro is approximately evaluated by measuring the temperature network of some specific points. © COPYRIGHT SPIE. Downloading of the abstract is permitted for personal use only.
Number of references: 8
Main heading: Ring lasers
Controlled terms: Deformation - Gyroscopes - Laser beams - Temperature distribution - Geometry - Stability
Uncontrolled terms: Geometric deformations - Geometrical stability - Measuring technology - Non reciprocal effects - Optical path lengths - Sagnac interferometer - Temperature compensation - Temperature field distribution
Classification code: 641.1 Thermodynamics - 744 Lasers - 744.8 Laser Beam Interactions - 921 Mathematics
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178. Study of compressive strength test methods for earth block masonry—Capping method and loading mode

Accession number: 20220311466380
Authors: Lan, Guanqi (1); Chao, Sisi (3); Wang, Yihong (2); Zhang, Kun (1)
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Abstract: Earth blocks are different from sintered bricks and concrete blocks, and earth block masonry (EBM) is built chiefly with slurry, which shows evident plasticity and water absorption softening characteristics. The compressive strength test method for conventional masonry cannot be applied to EBM. Therefore, establishing a compressive strength test method for EBM is essential in researching and applying this green building material. The capping method and loading mode are two key factors affecting masonry compressive strength testing. This study involved a series of uniaxial compression tests of masonry to analyze the influence of the capping method and loading mode on EBM compression performance. The optimal capping method and loading mode were determined based on the Analytic Hierarchy Process. Fast-hardening self-leveling plaster combined with plastic film isolation simultaneously eliminated moisture erosion in the slurry in an earth block and ensured close contact between the masonry top surface and loading plate. This combination capping effectively improved the stability of the test data, such that it should be used as the standard leveling method for compressive strength testing of EBM. The proposed loading mode can improve the

operability and effectively avoid impact load in the loading process. The stress state of a specimen under this loading mode was close to the actual working state, specimen deformation fully developed, and, thus, it should be used as the standard loading mode for compressive strength testing of EBM. © 2021 Elsevier Ltd
Number of references: 34
Main heading: Compressive strength
Controlled terms: Plaster - Water absorption - Stress analysis - Compression testing
Uncontrolled terms: Capping method - Compressive strength testing - Earth block masonry - Earth blocks - Green building materials - Levelings - Loading modes - Sintered bricks - Strength tests - Test method
Classification code: 414 Masonry Materials - 802.3 Chemical Operations - 951 Materials Science
DOI: 10.1016/j.jobe.2021.103094
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179. A nano-Fe3O4 material coated with AM/AMPS copolymer for viscosity enhancement at harsh reservoir conditions

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Authors: Qin, Wenlong (1, 2); Li, Ruixuan (1); Li, Hanxi (1); Jiang, Guanfeng (3); Qin, Guowei (1); Wang, Yang (1); Yang, Jiang (1)
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Publisher: John Wiley and Sons Inc
Abstract: A Fe3O4 nonaparticles coated with acrylamide/2-acrylamido-2-methyl-1-propanesulfonic acid copolymer(Fe3O4-Polymer NPs) was synthesized by emulsion polymerization. The structure of Fe3O4-Polymer NPs was then characterized by infrared spectroscopy, thermo-gravimetric analysis, and scanning electron microscopy. Meanwhile, the rheological properties of Fe3O4-Polymer NPs solution were systematically studied. The results showed that when dosage of hydrophobic Fe3O4-Oleic NPs is 10%, the synthesized Fe3O4-Polymer NPs was with the best viscosity enhancement performance, and the maximum saturation magnetization could reach to 20.0 emu/g. The apparent viscosity value of 5000 mg/L magnetic nano-composite solution was 154.6 mPa·s at 30°C. It shows strong viscosity enhancement ability and good temperature performance. Hence, it has great application potential in well stimulation of medium and high temperature oil and gas reservoirs. © 2021 Wiley Periodicals LLC.
Number of references: 16
Main heading: Emulsion polymerization
Controlled terms: Acrylic monomers - Plastic coatings - Saturation magnetization - Emulsification - Nanocomposites - Infrared spectroscopy - Petroleum reservoirs - Thermogravimetric analysis - Viscosity - Amides - Magnetite - Petroleum reservoir engineering - Scanning electron microscopy

Uncontrolled terms: Acrylamides - Apparent viscosity - High temperature - Oil and gas reservoir - Reservoir conditions - Rheological property - Temperature performance
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 701.2 Magnetism: Basic Concepts and Phenomena - 761 Nanotechnology - 801 Chemistry - 802.3 Chemical Operations - 804.1 Organic Compounds - 813.2 Coating Materials - 815.2 Polymerization - 817.2 Polymer Applications - 931.2 Physical Properties of Gases, Liquids and Solids - 933 Solid State Physics
Numerical data indexing: Mass_Density 5.00e+00kg/m3, Percentage 1.00e+01%, Temperature 3.03e+02K
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180. Scale Effect Model of Thermal Conductivity for Silicon-on-Insulator Field Effect Transistors

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Corresponding author: Zhang, Guohe
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Abstract: A scale effect model of thermal conductivity for silicon film in fully depleted silicon-on-insulator (FD SOI) metal-oxide-semiconductor field effect transistor (MOSFET) based on an equivalent phonon boundary scattering free path is proposed to address the problem that thermal conductivity of micro-nano scale silicon film suffers a severe scale effect. Phonon relaxation time influenced by bound state and free state electrons was quantified by studying phonon scattering mechanism in silicon materials. The analytical thermal conductivity model of silicon material was derived. In-depth studies of phonon boundary scattering mechanism were carried out. Equivalent phonon boundary scattering mean free path was obtained by solving the attenuation factor function. Phonon boundary scattering and phonon scattering in silicon material were coupled by the Matthiessen rule. An approximate analytical thermal conductivity model for nanoscale FD SOI MOSFET silicon film was established and verified by the original model of Asheghi and experimental tests. Results show that the equivalent mean free path of phonon boundary scattering in silicon film is about 2.5 times the film thickness. Phonon boundary scattering dominates microscale and nanoscale phonon heat transfer process, determining the ultra-fast heat transfer characteristics of phonons in thin silicon films. The thermal conductivity model based on the equivalent boundary scattering free path approximation is in good

agreement with original model and experimental data, highlighting the physical significance of the attenuation factor and effectively revealing the thermal conductivity of the nanodevice in a limited space. © 2021, Editorial Office of Journal of Xi'an Jiaotong University. All right reserved.
Number of references: 27
Main heading: MOSFET devices
Controlled terms: Metallic films - Nanotechnology - Phonons - Finite difference method - Oxide semiconductors - Thermal conductivity of solids - Silicon on insulator technology - MOS devices - Electron beam lithography - Heat transfer - Metals - Phonon scattering
Uncontrolled terms: Fully depleted silicon on insulators (FD SOI) - Heat transfer characteristics - Mean free path of phonons - Microscale and nanoscale - Phonon-boundary scattering - Phonon-scattering mechanisms - Silicon-on-insulator field-effect transistors - Thermal conductivity model
Classification code: 641.1 Thermodynamics - 641.2 Heat Transfer - 712.1 Semiconducting Materials - 714.2 Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 921.6 Numerical Methods
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181. Investigating low salinity waterflooding via glass micromodels with triangular pore-throat architectures (*Open Access*)

Accession number: 20204109307321
Authors: Liu, Yafei (1, 2); Block, Erica (3); Squier, Jeff (3); Oakey, John (2)
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Publisher: Elsevier Ltd
Abstract: Glass micromodels have been extensively used to simulate and investigate crude oil, brine, and surface interactions due to their homogeneous wettability, rigidity, and ability to precisely capture a reservoir's areal heterogeneity. Most micromodels are fabricated via two-dimensional patterning, implying that feature depths are constant despite varying width, which sub-optimally describes a three-dimensional porous architecture. We have successfully fabricated micromodels with arbitrary triangular cross sections via femtosecond pulsed laser direct writing resulting in depth-dependent channel width. As such, we have achieved arbitrary geometric control over device fabrication and thus a more accurate recapitulation of a geological porous media. With this fabrication technique, we are now able to directly observe pore-level, depth-dependent multiphase flow phenomena. This platform was used to study the low salinity effect (LSE) by simulating waterflooding processes using various brine solutions that differ in cation type and salinity. Patterned pore-throat structures were created to investigate displacement behavior during waterflooding. Real-time monitoring of the displacement processes, combined with a comparison of the brine chemistry before and after waterflooding provides an insight into realistic interactions occurring between crude oil and brine. The results indicate that produced emulsions were prone to coalesce in the presence of lower salinity brine. Combined with previous work, the LSE was interpreted as favored coalescence and resisted breakup that resulting in a more continuous aqueous phase during waterflooding therefore improving the displacement efficiency. © 2020 Elsevier Ltd
Number of references: 83
Main heading: Crude oil
Controlled terms: Fabrication - Glass - Porous materials - Oil well flooding
Uncontrolled terms: Displacement efficiency - Fabrication technique - Femtosecond pulsed laser - Geological porous media - Pore throat structures - Real time monitoring - Triangular cross-sections - Two-dimensional patterning

Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 812.3 Glass - 951 Materials Science
DOI: 10.1016/j.fuel.2020.119264
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Open Access type(s): All Open Access, Green
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182. Effect of temperature on the cyclic stress amplitude of enicrfe-1 ni-based alloy electrode and its mechanism

Accession number: 20214211022500
Authors: Zhang, Qunbing (1); Zhang, Jianxun (2); Wei, Wenlan (3)
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Conference name: 21st Chinese Materials Conference, CMC 2020
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Publisher: Trans Tech Publications Ltd
Abstract: Ni-based alloy welding material has been widely used in the welding and post-welding repair of high-temperature materials. The effect of temperature on the cyclic stress amplitude of ENiCrFe-1 Ni-base alloy electrode was studied under the same strain condition. The results showed that when the temperature was lower than 400 , it presented the characteristics of cyclic hardening and then cyclic softening. When the temperature was higher than 500 , it presented the characteristics of cyclic hardening and then cyclic stability. The main reason is that with the temperature increase, the dislocation structure changed more and more stable. The results not only enrich the internal mechanism of fatigue behavior of nickel-based alloy welding materials, but also have important reference value for improving the structural safety of welded joints. © 2021 Trans Tech Publications Ltd, Switzerland.
Number of references: 8
Main heading: Welding
Controlled terms: Nickel alloys - Hardening - Low-cycle fatigue - Morphology - Temperature - High temperature applications
Uncontrolled terms: Alloy electrodes - Cyclic hardening - Cyclic stress amplitudes - Dislocation morphology - Effects of temperature - High temperature materials - Low cycle fatigues - Ni based alloy - Welding materials - Welding repairs
Classification code: 537.1 Heat Treatment Processes - 538.2 Welding - 548.2 Nickel Alloys - 641.1 Thermodynamics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science

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183. Experimental investigation into the buckling behaviour of cable-stiffened steel columns

Accession number: 20212110404442
Authors: Lv, Gang (1); Li, Pengcheng (2); Zhang, Chenglong (2); Sun, Xiaojing (3); Chen, Enzhen (4)
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Corresponding author: Li, Pengcheng(lipengcheng@cqu.edu.cn)
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Article number: 106753
Language: English
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Publisher: Elsevier Ltd
Abstract: In this study, cable-stiffened steel columns (CSSCs), which primarily aim to enhance compression behaviour, were experimentally investigated. In contrast to other stiffened column types, the cable-stiffened steel columns investigated in this work were equipped with a three-branch crossarm system. A series of tests were performed on 2.4 m CSSCs with two different crossarm–main column connection types (i.e., rigid and scissor types). In addition to the connection types, the effects of crossarm length and initial pretension on the load carrying capacities of CSSCs were also studied experimentally. The experimental results indicate that the three-branch crossarm system is effective in improving the buckling load of ordinary compression columns. The findings prove that the scissor-type connections between the crossarms and the main column could also be used in practical applications. Moreover, a unique, asymmetric post-buckling mode for a CSSC with a three-branch crossarm system was observed. The effects of crossarm length and pretension in cables are also demonstrated. This results presented in this work could be of assistance in the further design of CSSCs. © 2021 Elsevier Ltd
Number of references: 22
Main heading: Cables
Controlled terms: Steel structures - Tools - Buckling - Steel construction
Uncontrolled terms: Buckling behaviour - Cable-stiffened column - Cross arm - Experimental investigations - Influencing factor - Postbuckling - Scissor-type connection - Stability behavior - Steel column - Three-branch
Classification code: 405.2 Construction Methods - 408.2 Structural Members and Shapes - 545.3 Steel
Numerical data indexing: Size 2.40E+00m
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184. Numerical Simulation of Gas-Liquid-Solid Three Phase in Bubble Column (*Open Access*)

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Authors: Wang, Le (1); Cao, Zhourong (2); Cai, Hulin (3); Wang, Yifei (4)
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Conference name: 1st International Conference on Physics and Engineering Mathematics, ICPEM 2020
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Abstract: Based on the Euler-Euler-Lagrangian framework, the Euler-Euler two-fluid model coupled with population balance model (PBM) and the Discrete Phase Model (DPM) model were used to simulate the gas-liquid-solid three phase dynamic behavior in the laboratory bubble column. The non-Newtonian properties of the liquid phase was considered in the numerical simulation, and the cases with different numerical models were discussed. It is found that the peak value velocity of liquid phase decrease due to the solid phase. The gas holdup remains almost the same in different cases with or without solid phase. There is no obvious periodic oscillation plume in non-Newtonian fluid. The interaction between solid and liquid has an effect on the flow field, gas distribution and viscosity distribution. The flow field calculated by CFD+PBM+DPM model forms three obvious vortices, while the symmetrical vortex is formed by CFD+PBM+DPM model, which is located on both sides of the bubble column. The distribution of dynamic viscosity simulated by different numerical models is basically the same in vary cases. © Published under licence by IOP Publishing Ltd.
Number of references: 20
Main heading: Flow fields
Controlled terms: Computational fluid dynamics - Viscosity - Bubble columns - Two phase flow - Numerical models - Non Newtonian liquids - Vortex flow - Non Newtonian flow
Uncontrolled terms: Discrete phase model - Dynamic viscosities - Gas liquid solid three phase - Non-Newtonian fluids - Non-Newtonian property - Periodic oscillation - Population balance modeling - Viscosity distribution
Classification code: 631.1 Fluid Flow, General - 723.5 Computer Applications - 802.1 Chemical Plants and Equipment - 921 Mathematics - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids
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Compendex references: YES
Open Access type(s): All Open Access, Gold
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185. Study on ecological safety evaluation method for pyrolysis residue of oily sludge (*Open Access*)

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Authors: Sun, Xuan (2); Guo, Zhiqiang (1); Zhong, Faguo (1); Wu, Zhibin (1); Yang, Penghui (2); Yu, Tao (2); Qu, Chengtun (2); Li, Jinling (2)
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Corresponding author: Qu, Chengtun(xianquct@xsy.edu.cn)
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Conference name: 3rd International Conference on Green Energy and Sustainable Development, GESD 2020
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Conference location: Shenyang City, Virtual, China
Conference code: 167246
Sponsor: CCCC Second Harbour Engineering Company Ltd.; Chishun Chemical; Wanxiang Group Technology Center
Publisher: IOP Publishing Ltd
Abstract: The pollutants in the pyrolysis residue of oily sludge are harmful to the ecosystem, so it is necessary to evaluate its ecological security before it is discharged into the ecosystem. The evaluation methods based on physical and chemical indexes and the evaluation methods based on biological toxicity were summarized and compared in order to provide reference for the safety evaluation of the pyrolysis residue of oily sludge. © Published under licence by IOP Publishing Ltd.
Number of references: 42
Main heading: Ecosystems
Controlled terms: Safety engineering - Pyrolysis
Uncontrolled terms: Biological toxicity - Ecological safety evaluations - Ecological security - Evaluation methods - Oily sludges - Pyrolysis residue - Safety evaluations
Classification code: 454.3 Ecology and Ecosystems - 802.2 Chemical Reactions - 914 Safety Engineering
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186. Visualisation and investigation of water retention in tight oil reservoir via real sandstone micro-models

Accession number: 20212610559460
Authors: Liu, Yafei (1, 2); Shi, Yuhan (3); Yang, Haien (4, 5); Wu, Tianjiang (4, 5); Liu, Xiong (1, 2); Liu, Shun (1, 2); Zhou, Desheng (1, 2)
Author affiliation: (1) Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil and Gas Reservoirs, Xi'an Shiyou University, Shaanxi, Xi'an, China; (2) Ministry of Education, Engineering Research Center of Western Low and Ultralow Permeability Oilfield Development and Management, Xi'an Shiyou University, Shaanxi, Xi'an, China; (3) PetroChina Changqing Oilfield Company, No. 6 Gas Production Plant, Shaanxi, Xi'an, China; (4) Oil and Gas Technology Research Institute, Changqing Oilfield Company, PetroChina, Shaanxi, Xi'an, China; (5) National Engineering Laboratory of Low Permeability Oil and Gas Field Exploratory and Development, Shaanxi, Xi'an, China
Corresponding author: Zhou, Desheng(deshengzhou@xsyu.edu.cn)
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Publisher: Inderscience Publishers
Abstract: Hydraulic fracturing is considered as an effective approach for the development of tight oil reservoirs. Unlike conventional reservoirs, after a large volume injection of the fracturing fluid, the flowback rate in tight oil reservoirs is considerably lower whereas the underlying mechanism explaining water retention remains unclear. Therefore, in this work, to investigate the water retention mechanism, fracturing fluid injection and particularly oil production process were emulated within real tight rock chips. Displacement and water retention events were directly visualised and captured using a microscope. As a result, the discrepancy between temporary and permanent residence of water inside the pore space was clarified. Additionally, nuclear magnetic resonance (NMR) scanning was incorporated to study the pore-scale fluid flow behaviours. Results show that a large portion of water was retained in smaller pores and water retention rate is positively correlated with oil recovery, implying invaded water replaced the oil and resided in the pore space therefore increasing the mobile oil in the formation as oil flowing back. This work proposed an interpretation of water retention mechanism in tight oil reservoir after hydraulic fracturing and provided an insight to optimise the development and production of tight oil reservoirs. © 2021 Inderscience Enterprises Ltd.
Number of references: 37
Main heading: Hydraulic fracturing
Controlled terms: Oil field development - Petroleum reservoir engineering - Nuclear magnetic resonance - Flow of fluids - Fracturing fluids - Low permeability reservoirs
Uncontrolled terms: Effective approaches - Flowing back - Large volume injection - Nuclear magnetic resonance(NMR) - Oil production - Oil recoveries - Oil reservoirs - Water retention
Classification code: 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General
DOI: 10.1504/ijogct.2021.115542
Funding Details: Number: 51804257,51874242, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-364, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0663, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2016ZX05050-009, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This work was supported by the National Natural Science Foundation of China (Grant No. 51874242 and No. 51804257); National Science and Technology Major Project of China (Grant No. 2016ZX05050-009); Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-364) and Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 19JK0663).
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187. Machine learning regression approach to on-chip optical frequency combs analyses

Accession number: 20220311468345
Authors: Wen, Jin (1, 2, 3); Qin, Weijun (1); Sun, Wei (1); He, Chenyao (1); Xiong, Keyu (1); Liang, Bozhi (1)
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Publisher: SPIE

Abstract: We present a practical machine learning (ML) method for serving accessible nonlinear functions, which tackles a regression problem with tremendous parameters. By solving the modified Lugiato-Lefever equation, datasets for emulating the silicon-on-insulator platform and generating the on-chip optical frequency comb (OFC) are gathered. Furthermore, a feed-forward network-based ML model is used to train the datasets, and the prediction of the related parameters is implemented synchronously. Numerical results show that the model combining the finite element method with the ML technique is capable of predicting the properties of on-chip frequency combs for the first time, as far as we know, paving the way for analyzing OFCs based on integrated silicon photonics. © 2021 Society of Photo-Optical Instrumentation Engineers (SPIE).
Number of references: 31
Main heading: Nonlinear optics
Controlled terms: Machine learning - Natural frequencies - Numerical methods - Optical materials - Silicon on insulator technology - Silicon photonics
Uncontrolled terms: Feed-forward network - Machine learning methods - Network-based - Neural-networks - Nonlinear functions - On chips - Optical frequency combs - Optical-frequency combs - Regression problem - Silicon-on-insulator platforms
Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics - 741.1.1 Nonlinear Optics - 741.3 Optical Devices and Systems - 921.6 Numerical Methods
DOI: 10.1117/1.OE.60.12.124101
Funding Details: Number: YCS19211035, Acronym: -, Sponsor: -; Number: 2018KJXX-042, Acronym: -, Sponsor: -; Number: 61505160, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JM-084, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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188. Variations of thick-skinned deformation along tumuxiuke thrust in Bachu uplift of Tarim Basin, northwestern China

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Publisher: Elsevier Ltd
Abstract: The curved Tumuxiuke thrust is the northeastern boundary of the Bachu uplift in the Tarim Basin. Based on the interpretation of 2D seismic reflection sections, thick-skinned deformation along the Tumuxiuke structural belt is characterized by monoclinal fault-propagation folds that alternate with push-up structures. The localization and patterns of thick-skinned deformation were controlled by pre-existing normal faults. The forward trishear modeling process further revealed the existence of short-cut thrusts branched from pre-existing normal faults and tested their effect on folding deformation. Monoclines decapitated by low-angle short-cut thrusts coexist with anticlines decapitated by high-angle inverted faults due to the selective inversion of pre-existing normal fault segments. Furthermore, the fault propagation to fault slip ratio (P/S) and the combined effect of multiple propagating thrusts determine the variations in the fold amplification rate and the growth-stratal architecture. The coeval activity of the western Kunlun orogen and the Tumuxiuke thrust in the Cenozoic indicates the far-field transmission of orogenic stress into the distal foreland. Under the approximately N–S-directed compressive stress, inverted structures in nearly W-E-striking segments

exhibit monoclinal fault-propagation folds controlled by forethrusts; for the oblique NW-SE-striking segments, the transpressional deformation was partitioned into the frontal contractional deformation zone and the backlimb strike-slip zone. © 2021 Elsevier Ltd
Number of references: 72
Main heading: Deformation
Controlled terms: Fault slips - Strike-slip faults - Compressive stress
Uncontrolled terms: Amplification rate - Fault-propagation folds - Folding deformations - Inverted structure - Northwestern China - Thick-skinned deformations - Transpressional deformation - Trishear modeling
Classification code: 484.1 Earthquake Measurements and Analysis
DOI: 10.1016/j.jsg.2021.104277
Funding Details: Number: 41172125,41572105, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: SINOPEC, Sponsor: SINOPEC Petroleum Exploration and Production Research Institute; Number: -, Acronym: -, Sponsor: Xinjiang Oilfield Company;
Funding text: This study is financially supported by National Natural Science Foundation of China (Grant No. 41572105, 41172125). We sincerely thank Northwest Oilfield Company, SINOPEC, for providing us with valuable seismic data. We are thankful to reviewer Pablo Granado, an anonymous reviewer and Editor Toru Takeshita for their constructive comments and suggestions. The trishear modeling was made using the software FaultFold v.7 developed by Richard W. Allmendinger which is freely available from http://www.geo.cornell.edu/geology/faculty/RWA/programs/faultfoldforward.html.This study is financially supported by National Natural Science Foundation of China (Grant No. 41572105 , 41172125). We sincerely thank Northwest Oilfield Company, SINOPEC, for providing us with valuable seismic data. We are thankful to reviewer Pablo Granado, an anonymous reviewer and Editor Toru Takeshita for their constructive comments and suggestions. The trishear modeling was made using the software FaultFold v.7 developed by Richard W. Allmendinger which is freely available from http://www.geo.cornell.edu/geology/faculty/RWA/programs/faultfoldforward.html .
Compendex references: YES
Database: Compendex
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189. Realize larger grain size of CH3NH3PbI3 film with reduced non-radiative recombination for high performance perovskite solar cells via precursor colloidal size engineering

Accession number: 20213110710188
Authors: Li, Yan (1); Zheng, Jialu (1); Chen, Xuelian (1); Sun, Can (1); Jiang, Hao (1); Li, Guangrong (2); Zhang, Xiaoyong (1)
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Corresponding author: Li, Yan(li1988yan@163.com)
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Article number: 161300
Language: English
ISSN: 09258388
CODEN: JALCEU
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In CH3NH3PbI3 perovskite solar cells, enhancement grain size of CH3NH3PbI3 to reduce the non-radiative at grain boundaries is an important way to reach high performance perovskite solar cell. However, it is still a challenge to enhance the grain size of CH3NH3PbI3 through a simple and low cost way. In this work, a larger precursor colloidal size is realized through tuning morphology of precursor CH3NH3I using a polar solvent of ethanol during purification, yielding a larger grain size of CH3NH3PbI3 film, and the as-prepared perovskite solar cells are shown to be dramatically increased to 17.49% with an increase in short circuit density, fill factor and open circuit voltage, as compared to that (14.28%) in the control device with CH3NH3I purified by non-polar solvent of diethyl ether. The investigation result showed the increased efficiency of perovskite solar cells prepared by ethanol purification is ascribed to a faster charge transfer at CH3NH3PbI3/TiO2 interface resulting from the reduced grain boundary defects.

Our work provides a route for improving the CH3NH3PbI3 device efficiency through a simple yet effective approach. © 2021 Elsevier B.V.
Number of references: 35
Main heading: Perovskite solar cells
Controlled terms: Lead compounds - Organic solvents - Sols - Charge transfer - Ethanol - Layered semiconductors - Perovskite - Efficiency - Iodine compounds - Open circuit voltage - Purification - Film preparation - Cell engineering - Grain boundaries - Grain size and shape
Uncontrolled terms: CH3NH3I purification - Colloidal size - Grain-boundary defects - Grainsize - Largest grain sizes - Methylammonium lead iodide (CH3NH3PbI3) - NH-3 - Non-radiative recombinations - Performance - Simple++
Classification code: 461.1 Biomedical Engineering - 482.2 Minerals - 702.3 Solar Cells - 712.1 Semiconducting Materials - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 913.1 Production Engineering
Numerical data indexing: Percentage 1.428E+01%, Percentage 1.749E+01%
DOI: 10.1016/j.jallcom.2021.161300
Funding Details: Number: 2019JQ-184,2019JQ-286,2021JQ-603, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory for Mechanical Behavior of Materials;
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190. Pollution risk estimation of the Cu element in atmospheric sedimentation samples by laser induced breakdown spectroscopy (LIBS) combined with random forest (RF)

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Authors: Feng, Ting (1); Zhang, Xin (1); Li, Maogang (1); Chen, Tingting (1); Jiao, Long (2); Xu, Yanyan (1); Tang, Hongsheng (1); Zhang, Tianlong (1); Li, Hua (1, 2)
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ISSN: 17599660
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Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Laser-induced breakdown spectroscopy (LIBS) combined with the random forest (RF) algorithm was proposed to predict three pollution indexes (geo-accumulation index, enrichment factor, and potential ecological risk index) of the Cu element in atmospheric sedimentation samples to evaluate the pollution risk. To begin with, the LIBS spectra of 15 atmospheric sedimentation samples from different locations were collected and the copper element was identified using the National Institute of Standards and Technology (NIST) database. Then, the influence of different spectral pretreatment methods (MSC, WT and D1st) on the predictive performance of the RF was discussed according to the calibration set with the determination coefficient (Rc2) and mean relative error (MREC) as evaluation indexes. Next, in order to obtain a better RF calibration model, a variable importance (VI) measurement was applied to select input variables from LIBS spectral data based on the optimal spectral pretreatment method, and the optimal variable importance threshold was selected as the input variable to establish the RF calibration model. Finally, the predictive performance of the optimal RF calibration model was verified using the prediction set with the determination coefficient (Rp2) and the mean relative error (MREP). The results show that Rp2 of the geo-accumulation index, enrichment factor and potential ecological risk index is up to 0.9971, 0.9919 and 0.9290, respectively, and MREP of the three

indexes is 0.0234, 0.1173 and 0.0810, respectively; the average relative standard deviation (RSD) of the prediction set for the three indexes is 2.16%, 5.78% and 0.71%, respectively. Furthermore, it can be inferred that Cu was at levels corresponding to serious pollution primarily because of anthropogenic activities based on the predictive Igeo, Er and RI values. Therefore, LIBS combined with the RF algorithm is a promising means which can achieve fast and simple estimation of the pollution risk degree of Cu in atmospheric sedimentation samples without complicated sample preparation to provide a basis for pollution prevention and control measures. © The Royal Society of Chemistry.
Number of references: 45
Main heading: Sedimentation
Controlled terms: Atomic emission spectroscopy - Risk perception - Copper - Forecasting - Laser induced breakdown spectroscopy - Decision trees - Risk assessment
Uncontrolled terms: Anthropogenic activity - Determination coefficients - Laserinduced breakdown spectroscopy (LIBS) - National Institute of Standards and Technology - Pollution prevention and controls - Potential ecological risk - Relative standard deviations - Spectral pre treatments
Classification code: 544.1 Copper - 802.3 Chemical Operations - 914.1 Accidents and Accident Prevention - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 931.1 Mechanics - 961 Systems Science
Numerical data indexing: Percentage 2.16e+00%, Percentage 5.78e+00%, Percentage 7.10e-01%
DOI: 10.1039/d1ay00879j
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191. Origins of overpressure in the central Xihu depression of the East China Sea shelf basin

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Authors: Li, Jun (1, 2); Zhao, Jingzhou (1, 2); Hou, Zhiqiang (3); Zhang, Shuping (3); Chen, Mengna (1, 3)
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Language: English
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CODEN: AABUD2
Document type: Journal article (JA)
Publisher: American Association of Petroleum Geologists
Abstract: The origins of overpressure in the central Xihu depression have been accepted to result from disequilibrium compaction and hydrocarbon generation. This study uses organic matter correction of the log data in source rocks and five empirical methods (the multilogging combination method, Bowers' method, the sonic velocity- density crossplot method, the porosity method, and the pressure inversion method) to understand the origins of overpressure in the central Xihu depression. Overpressure strata are mainly distributed in the following two areas: the (1) Pinghu Formation on the western slope of the central Xihu depression and (2) Pinghu Formation and lower part of the Huagang Formation in the western sag and the central inversion anticline belt. The areas contain two types of pressure profiles: normal pressure-overpressure and normal pressure-overpressure-normal pressure. At the western slope and the western sag, overpressure in source rock and nonsource rock was caused by hydrocarbon generation and pressure transfer, respectively. At the central inversion anticline belt, however, overpressure was caused by hydrocarbon generation and tectonic compression in source rock and by pressure transfer and tectonic compression in nonsource rock. We also propose criteria for confirming the combination of tectonic compression and hydrocarbon generation as the origin of overpressure, where the porosity distribution in the overpressured mudstone is consistent

with the normal compaction trend or conforms to a higher level of normal compaction as the depth increases. In the sonic velocity-effective stress diagram, sonic velocity increases with decreasing effective stress, whereas density and sonic velocity both increase with increasing normal compaction in the density-sonic velocity diagram. © 2021. The American Association of Petroleum Geologists.
Number of references: 76
Main heading: Compaction
Controlled terms: Hydrocarbons - Porosity - Rocks - Tectonics - Velocity
Uncontrolled terms: Effective stress - Hydrocarbon generation - Normal pressure - Overpressure - Pressure transfer - Sonic velocity - Source rocks - Tectonic compressions - Western sags - Xihu depression
Classification code: 481.1 Geology - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
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192. Recessed AlGaN/GaN Schottky Barrier Diodes with TiN and NiN Dual Anodes

Accession number: 20211610232925
Authors: Wang, Ting-Ting (1); Wang, Xiao (1); He, Yue (1); Jia, Mao (1); Ye, Qiong (1); Xu, Yang (1); Zhang, Yi-Han (1); Li, Yang (1); Bai, Li-Hua (2); Ma, Xiao-Hua (1); Hao, Yue (1); Ao, Jin-Ping (1, 3)
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Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: High-performance AlGaN/GaN lateral Schottky barrier diodes (SBDs) with recess structure and dual metal nitride anodes were demonstrated. With high work-function and nonrecess structure, a NiN anode enhances the breakdown voltage (BV), while a TiN anode reduces the turn-on voltage (${V}_{ \mathrm{\scriptscriptstyle ON}}$) due to its low work-function and contact to the two-dimensional electron gas (2DEG) layer directly on a recess structure. As the length of the NiN anode (${L}_{r}$) on the nonrecess region decreases from 75 to 3 μm , ${V}_{ \mathrm{\scriptscriptstyle ON}}$ is reduced from 0.56 to 0.30 V, while the reverse leakage current slightly increases from ${3} \times {10}^{-{4}}$ to ${2} \times {10}^{-{3}}$ A/cm2 at the bias of -10 V. The lateral AlGaN/GaN SBD with a ${L}_{r}$ of 3 μm at a distance of cathode-anode (${L}_{\text {AC}}$) of 20 μm achieves a high BV of 1.62 kV, an ultralow ${V}_{ \mathrm{\scriptscriptstyle ON}}$ of 0.30 V and a small capacitance of 6.0 pF at zero bias with little degradation on ON-resistance, indicating superior potential application in high-frequency and high-power devices. © 1963-2012 IEEE.
Number of references: 25
Main heading: Anodes

Controlled terms: Aluminum gallium nitride - Bias voltage - Diodes - Gallium nitride - Schottky barrier diodes - Titanium nitride - Tin - III-V semiconductors - Work function - Capacitance - Electric breakdown
Uncontrolled terms: High frequency HF - High work function - High-power devices - Low work function - Reverse leakage current - Schottky barrier diodes (SBDs) - Turn-on voltages - Two-dimensional electron gas (2DEG)
Classification code: 546.2 Tin and Alloys - 701.1 Electricity: Basic Concepts and Phenomena - 712.1 Semiconducting Materials - 713 Electronic Circuits - 714.1 Electron Tubes - 714.2 Semiconductor Devices and Integrated Circuits - 804.2 Inorganic Compounds - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
Numerical data indexing: Capacitance 6.00e-12F, Voltage -1.00e+01V, Voltage 1.62e+03V, Voltage 3.00e-01V, Voltage 5.60e-01V to 3.00e-01V
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193. Effect of High Energy Shot Peening on Microstructure and Properties of R60702 Welded Joints

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Title of translation: R60702
Authors: Li, Ning (1, 2); Zhang, Min (1); Luo, Sheji (3); Ye, Jianlin (2); Li, Fengbo (2); Zheng, Min (2)
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Corresponding author: Zhang, Min(zhmmn@xaut.edu.cn)
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Language: Chinese
ISSN: 1002185X
CODEN: XJCGEA
Document type: Journal article (JA)
Publisher: Science Press
Abstract: The welded joint of industrial pure zirconium (R60702) was treated by surface high energy shot peening (HESP). The microstructure, surface grain size, micro distortion, gradient structure and crystal orientation were characterized by optical microscope (OM), X-ray diffraction (XRD) and electron back scattered diffraction (EBSD). A surface roughness measuring instrument was used to measure and evaluate the surface roughness, and an electrochemical workstation was used to study the corrosion resistance of R60702 welded joints. The results show that after HESP treatment, a gradient structure is formed on the surface layer of the industrial pure zirconium welded joints with a thickness of about 110 μm, and the grains of top layer reach the nanometer level. In the process of surface nanocrystallization, twins and dislocation slip are the main deforming mechanism. After HESP treatment, the self-corrosion potential of R60702 welded joints is positively shifted, and the corrosion current density is reduced. HESP

treatment makes the surface structure of the three areas of the welded joints uniform, and the self-corrosion potential tends to be uniform, which effectively inhibits galvanic corrosion. © 2021, Science Press. All right reserved.
Number of references: 21
Main heading: Corrosion resistance
Controlled terms: Welding - Corrosion inhibitors - Crystal orientation - Zirconium - Shot peening - Surface roughness - Welds
Uncontrolled terms: Corrosion current densities - Corrosion potentials - Deforming mechanisms - Electron back-scattered diffraction - High energy shot peening - Measuring instruments - Microstructure and properties - Surface nanocrystallization
Classification code: 538.2 Welding - 539 Metals Corrosion and Protection; Metal Plating - 539.1 Metals Corrosion - 539.2.1 Protection Methods - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 803 Chemical Agents and Basic Industrial Chemicals - 931.2 Physical Properties of Gases, Liquids and Solids - 933.1.1 Crystal Lattice
Numerical data indexing: Size 1.10e-04m
Compendex references: YES
Database: Compendex
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194. Notes on the diameter of the complement of the power graph of a finite group

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Authors: Ma, Xuanlong (1); Doostabadi, Alireza (2); Wang, Kaishun (3)
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Source title: arXiv
Abbreviated source title: arXiv
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Language: English
E-ISSN: 23318422
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Publisher: arXiv
Abstract: We determine the diameter of every connected component of the complement of the power graph and the enhanced power graph of a finite group, which completely answers two questions by Peter J. Cameron.MSC Codes 05C25, 05C12 © 2021, CC BY.
Number of references: 34
Uncontrolled terms: Connected component - Diameter - Enhanced power graph - Finite groups - Power graphs
Compendex references: YES
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Preprint ID type: ARXIV
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Data Provider: Engineering Village
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195. High-Purity, Thick CsPbCl3Films toward Selective Ultraviolet-Harvesting Visibly Transparent Photovoltaics

Accession number: 20214511138059
Authors: Chen, Dandan (1, 2); Ba, Yanshuang (1); Deng, Minyu (1); Zhu, Weidong (1); Chai, Wenming (1); Xi, He (1); Chen, Dazheng (1); Zhang, Jincheng (1); Zhang, Chunfu (1); Hao, Yue (1)
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Corresponding authors: Zhu, Weidong(wdzhu@xidian.edu.cn); Zhang, Chunfu(cfzhang@xidian.edu.cn)
Source title: ACS Applied Energy Materials
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Language: English
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Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Inorganic lead halide perovskite CsPbCl3 with an absorption edge of ~420 nm and exceptional optoelectronic properties is promising for selective ultraviolet (UV)-harvesting visibly transparent photovoltaics. However, the low solubilities of CsCl and PbCl2 precursor materials in common solvents make it difficult to prepare high-quality CsPbCl3 films with the desired thickness. Herein, we demonstrate a water-assisted two-step spin coating growth strategy for CsPbCl3 films. Because of the high solubility of CsCl but the low solubility of PbCl2 in water, it becomes possible to produce CsPbCl3 films by direct spin coating of CsCl/H2O solution onto a PbCl2 film without damaging it. After optimizing the dose of CsCl/H2O solution, CsPbCl3 films with a full surface coverage, pure perovskite phase, high crystallinity, large average grain size of 620 nm, and thickness of ~310 nm are obtained. Consequently, the selective UV-harvesting visibly transparent PSCs with the CsPbCl3 films yield an optimized efficiency of 1.19%, an average visible transparency of 53.1%, and a color rendering index of 91.1. The findings of our study make it clear that the water-assisted two-step spin coating growth strategy is highly feasible to prepare CsPbCl3 films with desired characters, and thus, it has a great potential in the future development of CsPbCl3 optoelectronic devices. ©
Number of references: 43
Main heading: Lead compounds
Controlled terms: Crystallinity - Solubility - Chlorine compounds - Harvesting - Perovskite - Cesium compounds - Films - Optoelectronic devices - Coatings
Uncontrolled terms: Coating growth - Growth strategy - Inorganic perovskite - Inorganics - Photovoltaics - Solution reaction - Transparent photovoltaic - Two-step solution reaction - Ultraviolet harvesting - Water assisted
Classification code: 482.2 Minerals - 741.3 Optical Devices and Systems - 801.4 Physical Chemistry - 813.2 Coating Materials - 821.3 Agricultural Methods - 933.1 Crystalline Solids
Numerical data indexing: Percentage 1.19E+00%, Percentage 5.31E+01%, Size 3.10E-07m, Size 4.20E-07m, Size 6.20E-07m
DOI: 10.1021/acsaem.1c01649
Funding Details: Number: 61804113,61874083,62004151,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020GXLH-Z-014, Acronym: NPU, Sponsor: Northwestern Polytechnical University; Number: 2019M663628, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: -, Sponsor: ShanXi Science and Technology Department;
Funding text: The authors gratefully acknowledge the financial support from the National Natural Science Foundation of China (61804113, 61874083, and 62004151), the China Initiative Postdocs Supporting Program (BX20190261), the China Postdoctoral Science Foundation (2019M663628), the National Natural Science Foundation of Shaanxi Province (2018ZDCXL-GY-08-02-02 and 2017JM6049), and the Joint Research Funds of Department of Science and Technology of Shaanxi Province and Northwestern Polytechnical University (no. 2020GXLH-Z-014).
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196. Solutions to two open problems in topological residuated lattices

Accession number: 20201208333159
Authors: He, Pengfei (1); Yang, Jiang (2); Wang, Juntao (3)
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Corresponding author: Wang, Juntao(wjt@xsyu.edu.cn)
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Abbreviated source title: Fuzzy Sets Syst
Volume: 405
Volume title: Algebra
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Language: English
ISSN: 01650114
CODEN: FSSYD8
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: The main aim of this paper is to solve two open problems in topological residuated lattices. In this paper, given a linear topological residuated lattice, we find sufficient and necessary conditions under which the original topology coincides with the new one induced by a system of filters of the residuated lattice. This result will be valid for finite and infinite BL-algebras, which is a complete answer to the open problem proposed by Zahiri and Borzooei in 2016 and improves the incomplete answer given by Yang et al. in 2018. Moreover, using the topology induced by a system of filters of a residuated lattice, we prove that the set of all filters of the residuated lattice and the set of all corresponding zero-dimensional linear topological residuated lattices have the same cardinality. This result gives a negative answer to the open problem proposed by Yang and Zhang in 2019. Finally, we show that the category of residuated lattices is the reflective subcategory of the category of linear topological residuated lattices. © 2020 Elsevier B.V.
Number of references: 15
Main heading: Topology
Uncontrolled terms: BL-algebra - Cardinalities - Filter - Reflective subcategory - Residuated lattices - Sufficient and necessary condition - Zero-dimensional
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.1016/j.fss.2020.03.011
Funding Details: Number: GK202003003, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: 19JK0653, Acronym: -, Sponsor: -; Number: 2016M602761,2019M663919XB, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2019JQ-472, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 11901371,11601302,61976244,11961016, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The authors are very grateful to the referees and the Area Editor, for their valuable comments and suggestions. This work is supported by the National Natural Science Foundation of China (11901371 , 11601302 , 61976244 , 11961016), the Postdoctoral Science Foundation of China (2019M663919XB , 2016M602761), Natural Science Foundation of Shaanxi Province (2019JQ-472), and the Natural Science Foundation of Education Committee of Shannxi Province (19JK0653) and the Fundamental Research Funds for the Central Universities (GK202003003).
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197. Dual-core fiber based in-line Michelson interferometer for humidity sensing

Accession number: 20211910344792
Authors: Shao, Min (1); Zhang, Rong (1); Zhao, Xue (1); Zhang, Wensong (2); Lu, Qingqing (2); Qiao, Xueguang (3)
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Source title: Optical Fiber Technology
Abbreviated source title: Opt. Fiber Technol.
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Issue date: July 2021
Publication year: 2021
Article number: 102570
Language: English
ISSN: 10685200
CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: A high-sensitive optical fiber humidity sensor based on in-line Michelson interferometer (MI) is proposed and demonstrated. The MI is formed by an asymmetric dual-core fiber (DCF) spliced with a short section of multimode fiber (MMF). The MMF serves as fiber coupler, while the DCF creates a strong intermodal interference to strengthen the interaction between light and ambient moisture. The sensor presents a humidity sensitivity of -0.199 dB/%RH in a wide relative humidity (RH) range of 20–90%RH without any humidity-sensitive material. An experiment based on human breathing shows that the response time and recovery time are 562 ms and 308 ms, respectively. In addition,

the performance of stability and temperature response are tested, the standard measurement error is 0.21 %RH and the temperature sensitivity is 0.0398 nm/°C. Experimental results indicate the sensor has a good practical prospect. © 2021 Elsevier Inc.
Number of references: 21
Main heading: Humidity sensors
Controlled terms: Michelson interferometers - Multimode fibers
Uncontrolled terms: Humidity sensitive - Humidity sensitivity - In-line Michelson interferometers - Intermodal interferences - Multi-mode fibers (MMF) - Standard measurements - Temperature response - Temperature sensitivity
Classification code: 443.2 Meteorological Instrumentation - 741.1.2 Fiber Optics - 941.3 Optical Instruments
Numerical data indexing: Time 3.08e-01s, Time 5.62e-01s
DOI: 10.1016/j.yofte.2021.102570
Funding Details: Number: YSC19112034, Acronym: -, Sponsor: -; Number: 61805197, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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198. A fully coupled and full 3D finite element model for hydraulic fracturing and its verification with physical experiments

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Title of translation:
Authors: Bao, Jinqing (1); Yang, Chenxu (1); Xu, Jianguo (2); Liu, Hongxia (2); Wang, Gaocheng (3); Zhang, Guangming (4); Cheng, Wei (4); Zhou, Desheng (1)
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Issue date: August 2021
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Pages: 833-841
Language: Chinese
ISSN: 10000054
CODEN: QDXKE8
Document type: Journal article (JA)
Publisher: Tsinghua University
Abstract: Two sets of equation are proposed to describe the key mechanic issues in hydraulic fracturing including rock deformation, fracture propagation, fluid flow and leak-off in fractures, where the finite element method is taken as the numerical foundation. The fully coupled and full 3-D numerical model for hydraulic fracturing is set up via solving the coupled two sets of equation simultaneously. Comparisons of the numerical simulations from the model with two classical physical experiments are made, and they have excellent agreements on net pressure, fracture widths, fracture lengths, fracture propagation modes, et al. The numerical model is verified by the experiments, and shows that the cubic law in the hydraulic fracturing theory is still applicable even when the fracture widths are at the order of microns. © 2021, Tsinghua University Press. All right reserved.
Number of references: 36
Main heading: Finite element method
Controlled terms: Flow of fluids - Hydraulic fracturing - Numerical methods - Fracture - Numerical models
Uncontrolled terms: 3-D numerical modeling - 3D finite element model - Fracture length - Fracture propagation - Fracture width - Fully-coupled - Physical experiments - Rock deformation
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 921 Mathematics - 921.6 Numerical Methods - 951 Materials Science

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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199. Characterizations of FI-lattices associated to implicative derivations

Accession number: 20214511135144
Authors: Wang, Mei (1); Ma, Nana (2); Jiang, Nan (3); Wang, Juntao (3)
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Corresponding author: Wang, Juntao(wjt@xsyu.edu.cn)
Source title: Italian Journal of Pure and Applied Mathematics
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Publication year: 2021
Pages: 795-804
Language: English
ISSN: 11268042
E-ISSN: 22390227
Document type: Journal article (JA)
Publisher: Forum-Editrice Universitaria Udinese SRL
Abstract: In this paper, we discuss related properties of implicative derivations and give some characterizations of them in FI-lattices. Then we show that every implicative derivation on regular FI-lattice is principle. Finally we prove that every Boolean algebra is isomorphic to the the algebra of all implicative derivations. © 2021 Forum-Editrice Universitaria Udinese SRL. All rights reserved.
Number of references: 13
Main heading: Boolean algebra
Controlled terms: Fuzzy logic
Uncontrolled terms: Algebra of fuzzy logic - FI-lattice - Fuzzy-Logic - Implicative derivation - Property
Classification code: 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 921.1 Algebra
Funding Details: Number: 20JK0626, Acronym: -, Sponsor: -; Number: 12001423,11961016,12001413,11926503, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020JQ-762,2019JQ-869,2021JQ-579, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
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Compendex references: YES
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200. Study on Rapid Quantitative Analysis Method of Methanol Content in Methanol Gasoline by Raman Spectroscopy and Partial Least Squares

Accession number: 20212910661411
Title of translation:
Authors: Li, Mao-Gang (1); Yan, Chun-Hua (2); Du, Yao (1); Zhang, Tian-Long (2); Li, Hua (1, 2)
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Abbreviated source title: Guang Pu Xue Yu Guang Pu Fen Xi
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Pages: 2099-2104
Language: Chinese
ISSN: 10000593
CODEN: GYGFED
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Methanol gasoline is a new fuel to replace traditional gasoline, and its quality is greatly affected by methanol content. Therefore, the rapid analysis and detection of methanol content in methanol gasoline will have far-reaching significance for its quality control. A rapid quantitative analysis method of methanol content in methanol gasoline based on Raman spectroscopy and partial least squares (PLS) was established in this work. Raman spectra of 49 methanol gasoline samples were collected by laser Raman spectrometer, and spectral analysis was carried out. The effects of five spectral pretreatment methods on the raw Raman spectra of methanol gasoline were compared. In addition, variable importance in projection (VIP) was used to extract the Raman spectra's feature variables preprocessed by wavelet transform (WT). The number of latent variables (LVs) and VIP threshold of the PLS calibration model was optimized by 5-flod cross-validation (CV). Under the optimal input variables and model parameters, PLS models based on different input variables were constructed. The results show that compared with RAW-PLS and WT-PLS, VIP-PLS can achieve better analysis performance, with the determination of the prediction set (Rp2) of 0.960 4 and root mean square error of prediction set (RMSEP) of 0.034 1. Therefore, Raman spectroscopy combined with PLS is a fast and accurate method for analysing methanol content in methanol gasoline. © 2021, Peking University Press. All right reserved.
Number of references: 14
Main heading: Raman scattering
Controlled terms: Wavelet transforms - Raman spectroscopy - Least squares approximations - Quality control - Spectrometers - Mean square error - Methanol - Gasoline - Spectrum analysis
Uncontrolled terms: Cross validation - Laser raman spectrometers - Methanol content - Model parameters - Partial least square (PLS) - Root-mean-square error of predictions - Spectral pre treatments - Variable importances
Classification code: 523 Liquid Fuels - 741.1 Light/Optics - 741.3 Optical Devices and Systems - 804.1 Organic Compounds - 913.3 Quality Assurance and Control - 921.3 Mathematical Transformations - 921.6 Numerical Methods - 922.2 Mathematical Statistics
DOI: 10.3964/j.issn.1000-0593(2021)07-2099-06
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

201. Research on application of intelligent prestressed construction technology based on computer software analysis (*Open Access*)

Accession number: 20212410506633
Authors: Shi, Dong (1); Zhang, Limei (2)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, Xi'an; 710065, China; (2) Xi'an Water Supply Corporation Limited, Xi'an; 710082, China
Corresponding author: Shi, Dong(shidong@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1915
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Issue: 2
Issue title: 2021 International Conference on Information Systems and Computer Engineering, ISCE 2021 - Computer Engineering
Issue date: May 31, 2021
Publication year: 2021
Article number: 022019
Language: English
ISSN: 17426588
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Conference name: 2021 International Conference on Information Systems and Computer Engineering, ISCE 2021
Conference date: March 29, 2021 - March 30, 2021
Conference location: Qingdao, China
Conference code: 169413
Publisher: IOP Publishing Ltd
Abstract: The important process of prestressing work is prestressing tension, which can directly affect the safety and durability of prestressed structure and frame. The role of prestressing tension is to ensure the quality of the bridge, which is related to the safety and durability of the bridge structure. This article mainly analyzes the intelligent tension technology, studies the specific application of the intelligent tension technology in construction, and does a little research on the future development of the intelligent tension technology. Practice has proved that the elongation value of the tension force of the intelligent tension system is accurate in operation, has good performance, high safety performance, simple operation and quality control. © Published under licence by IOP Publishing Ltd.
Number of references: 11
Main heading: Prestressing
Controlled terms: Application programs - Durability - Safety engineering - Quality control
Uncontrolled terms: Bridge structures - Construction technologies - Elongation values - High safety - Pre-stressed - Prestressed structures - Simple operation - Tension force
Classification code: 723 Computer Software, Data Handling and Applications - 913.3 Quality Assurance and Control - 914 Safety Engineering
DOI: 10.1088/1742-6596/1915/2/022019
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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202. High-Sensitive Temperature Sensor Based on Cascaded Polymer-Air Cavities

Accession number: 20213310762543
Authors: Liu, Yinggang (1); Li, Bowen (1); Song, Xiaoya (1); Huang, Liang (1); Dong, Jingfei (1)
Author affiliation: (1) Shaanxi Engineering Research Center of Oil and Gas Resource Optical Fiber Detection, Xi'An Shiyou University, Xi'an, China
Corresponding author: Liu, Yinggang(ygliu@xsyu.edu.cn)
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Abbreviated source title: IEEE Photonics Technol Lett
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Issue date: July 15, 2021
Publication year: 2021
Pages: 711-714
Article number: 9453789
Language: English
ISSN: 10411135
E-ISSN: 19410174
CODEN: IPTLEL
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: A cascaded Fabry-Perot interferometers (FPIs) structure based on polymer-air cavities is proposed and demonstrated. The structure can be easily manufactured by inserting a section of single-mode fiber (SMF) with a flat end-face into the silica capillary tube (SCT), then filling the SCT with polymer under capillary action, and last inserting another segment of SMF from the other end of the SCT. Thus, a cascaded FPIs structure based on polymer-air cavities are formed. Through tracing the dip wavelengths of superimposed spectra resulting from the two FPIs in temperature change, experimental results show that the spectral dip fringes have clearly linear blue-shifts with the increase of temperature. The linearity of fitting curve exceeds to 0.99, and the temperature sensitivity of sensor is -6.76 nm/°C in temperature range of 29 35 °C. Furthermore, it is pointed out for the first time that a closed air-cavity will have a certain inhibitory effect on the thermal expansion of the polymer. Due to serial merits of higher temperature sensitivity and ease of fabrication, the proposed sensor is more potentially competitiveness in practical applications. © 1989-2012 IEEE.
Number of references: 21
Main heading: Fiber optic sensors

Controlled terms: Single mode fibers - Curve fitting - Silica - Fabry-Perot interferometers - Thermal expansion - Temperature sensors - Capillary tubes
Uncontrolled terms: Capillary action - Fitting curves - Inhibitory effect - Silica capillary - Structure-based - Temperature changes - Temperature range - Temperature sensitivity
Classification code: 619.1 Pipe, Piping and Pipelines - 641.1 Thermodynamics - 741.1.2 Fiber Optics - 921.6 Numerical Methods - 941.3 Optical Instruments - 944.5 Temperature Measuring Instruments - 951 Materials Science
DOI: 10.1109/LPT.2021.3088944
Funding Details: Number: YCS20211069, Acronym: -, Sponsor: -; Number: 61805197, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2013JM8032, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 20JS122, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: Manuscript received May 6, 2021; revised June 2, 2021; accepted June 9, 2021. Date of publication June 14, 2021; date of current version June 22, 2021. This work was supported in part by the National Natural Science Foundation of China under Grant 61805197, in part by the Natural Science Basic Research Plan in Shaanxi Province of China under Grant 2013JM8032, in part by the Scientific Research Program Funded by Shaanxi Provincial Education Department of China under Grant 20JS122, and in part by the Graduate Student Innovation Fund of Xi'an Shiyou University under Grant YCS20211069. (Corresponding author: Yinggang Liu.) The authors are with the Shaanxi Engineering Research Center of Oil and Gas Resource Optical Fiber Detection, Xi'an Shiyou University, Xi'an 710065, China, and also with the Key Laboratory of Well Logging, China National Petroleum Corporation (CNPC), Xi'an 710077, China (e-mail: ygliu@xsyu.edu.cn; 181070563@stumail.xsyu.edu.cn; 181070566@ stumail.xsyu.edu.cn; 19211080786@stumail.xsyu.edu.cn; 19211080775@ stumail.xsyu.edu.cn).
Compendex references: YES
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Data Provider: Engineering Village
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203. 2021 international conference on computer technology and power electronics (*Open Access*)

Accession number: 20214311054517
Authors: Wang, Jianning (1); Zhao, Yuehua (2)
Author affiliation: (1) College of Computer Science, Xi'an Shiyou University, China; (2) School of Computer Science and Telecommunication Engineering, Jiangsu University, China
Source title: Journal of Physics: Conference Series
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Issue title: 2021 International Conference on Computer Technology and Power Electronics, ICCTPE 2021
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Article number: 011001
Language: English
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Document type: Journal article (JA)
Conference name: 2021 International Conference on Computer Technology and Power Electronics, ICCTPE 2021
Conference date: March 30, 2021 - March 31, 2021
Conference location: Dalian, Virtual, China
Conference code: 172125
Sponsor: Jilin University; Juneng Electronic Technology Co., Ltd; Shaanxi Juxing Exhibition Co., Ltd
Publisher: IOP Publishing Ltd
DOI: 10.1088/1742-6596/2023/1/011001
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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204. Design and Implementation of Drilling Engineering Simulation System Based on Unity3D (*Open Access*)

Accession number: 20212110392505
Authors: Huo, Aiqing (1); Xu, Jingrong (1); Li, Haopingm (2); Wang, Zewen (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China; (2) RandD Management Department xi'An Changyuan Electronic Engineering Co. Ltd., Xi'an, China
Corresponding author: Huo, Aiqing(aqhuo@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1894
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012043
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In this paper, a drilling engineering simulation system is designed and developed aiming at some problems existing in traditional well control safety operation training. The overall design and process of the virtual simulation system were given, optimized and rendered the models of the drilling engineering equipment and the wellsite scene were created using the software 3Ds Max. With the aid of the Unity3D development platform, the oil drilling virtual simulation system was constructed, which realized the interaction between the wellsite roaming system and drilling operations. The system has the characteristics of low development cost, strong real-time interaction, realistic immersion and meets the needs of oilfield drilling engineering training. © Published under licence by IOP Publishing Ltd.
Number of references: 13
Main heading: Design
Controlled terms: Drilling equipment - Cost engineering - Infill drilling - Oil field development - Simulation platform - Computer software
Uncontrolled terms: Design and implementations - Development costs - Development platform - Drilling engineering - Drilling operation - Real time interactions - Safety operations - Virtual simulation system
Classification code: 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 723 Computer Software, Data Handling and Applications - 723.5 Computer Applications - 911 Cost and Value Engineering; Industrial Economics
DOI: 10.1088/1742-6596/1894/1/012043
Funding Details: Number: 2020GY-152, Acronym: -, Sponsor: -; Number: 17JS108, Acronym: -, Sponsor: -;
Funding text: This research was supported by the scientific research project of the Key Laboratory of Education Department of Shaanxi Province (17JS108).This research was partially supported by General Project of Shaanxi Provincial Science and Technology Department-Industrial Field (No. 2020GY-152).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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205. Study of load combination values for existing frame structures

Accession number: 20214711213763
Authors: Cheng, Kaikai (1); Yao, Jitao (2); Cheng, Zhengjie (2)
Author affiliation: (1) Mechanical Engineering College, Xi'An Shiyou University, Xi'an, China; (2) School of Civil Engineering, Xi'An University of Architecture and Technology, Xi'an, China
Corresponding author: Cheng, Kaikai(chengkaikai_1990@126.com)
Source title: Proceedings of the Institution of Civil Engineers: Structures and Buildings

Abbreviated source title: Proc. Inst. Civ. Eng. Struct. Build.
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Publication year: 2021
Pages: 1022-1030
Language: English
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Document type: Journal article (JA)
Publisher: ICE Publishing
Abstract: A great number of structures dating back several centuries have been preserved on the basis of their historical and economic importance. In terms of the actual condition of these structures, it is necessary to analyse and assess their structural performance. Although there are differences between the design of new structures and the assessment of existing structures, the design expression of the ultimate limit state (ULS) and corresponding partial factors are currently used to evaluate the reliability of existing structures. Based on the design expression of the ULS and probabilistic approaches to consider the structural resistances and loads of existing structures, load combination values (LCVs) of existing frame structures under different target periods of usage (TPUs) were ascertained. These acquired values can be applied to the safety analysis of existing structures. To determine the LCVs, optimised analyses of 14 representative structural components taking into account different loading ratios under four load combinations were performed. The results show that different TPUs for existing structures lead to lower or higher LCVs compared with the initial design phase. Therefore, different TPUs should be considered during the assessment of existing structures. © 2020 ICE Publishing: All rights reserved.
Number of references: 40
Main heading: Risk assessment
Controlled terms: Risk analysis - Structural analysis - Safety engineering - Structural frames
Uncontrolled terms: Design expressions - Economic importance - Existing structure - Frame structure - Load combination - Maintenance inspections - Probability analysis - Risk & probability analyse - Risk probabilities - Safety hazards
Classification code: 408.1 Structural Design, General - 408.2 Structural Members and Shapes - 914 Safety Engineering - 914.1 Accidents and Accident Prevention - 922 Statistical Methods
DOI: 10.1680/jstbu.18.00224
Funding Details: Number: 51278401, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-055, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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206. Study on the ground measurements of key parameters of tubing leakage point in sustained annular pressure gas well

Accession number: 20213510848124
Authors: Feng, Cao (1, 5); Heng, Luo (2); Ruirong, Dang (3); Zheng, Huifeng (4)
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Corresponding author: Ruirong, Dang(1061085600@qq.com)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Article number: 9513398
Language: English
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Sustained annular pressure (SCP) is a common phenomenon in offshore gas fields, which poses a threat to the integrity of gas Wells. Among all the causes, the leakage of tubing string poses the greatest threat to the safety of production. In production practice, it is necessary to measure the key parameters of the leakage point to evaluate the risk. Aiming at this demand, the gas flow model in tubing and the pressure build up model in A-annulus are established. A method to determine the key parameters of leakage point was proposed based on the dynamic liquid level test and annular pressure releasing down test. Through analyzing the flow conditions of leakage point at different data points, the cross-validation method of test data was presented. This method not only provides two kinds of optional test methods for key parameters of leakage point, but also evaluates the reliability of test data, so it has a good value of popularization in offshore gas fields. © 2021 IEEE.
Number of references: 21
Main heading: Risk assessment
Controlled terms: Flow of gases - Offshore gas wells - Testing - Gas industry - Offshore gas fields - Offshore oil well production - Gases - Tubing - Offshore oil wells
Uncontrolled terms: Annular pressures - Cross-validation methods - Dynamic liquid levels - Flow condition - Gas flow model - Ground measurements - Pressure build up - Production practice
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 619.1 Pipe, Piping and Pipelines - 631.1.2 Gas Dynamics - 674.2 Marine Drilling Rigs and Platforms - 914.1 Accidents and Accident Prevention
DOI: 10.1109/ICMSP53480.2021.9513398
Funding Details: Number: ST2020ZCZJ0007, Acronym: -, Sponsor: -; Number: 41874158, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China;
Funding text: ACKNOWLEDGMENTS The authors gratefully acknowledge the financial support from the CNOOC Safety Technology Service Co., Ltd. Zhanjiang Branch (contract NO: ST2020ZCZJ0007), this research is also supported by Natural Science Foundation of China (Grant number: 41874158)
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207. An Optimal Design Algorithm for Proppant Placement in Slickwater Fracturing

Accession number: 20221511944983
Authors: Wang, HaiYang (1); Zhou, Desheng (1); Xu, Jinze (1); Liu, Shun (1); Liu, Erhu (2); Gao, Qian (1); Liu, Xiong (1); Guo, Minhao (3); Wang, Panfeng (4)
Author affiliation: (1) Xi'an Shiyou University, China; (2) Yanchang Petroleum Group ExplorationCompany, China; (3) Northwest University, United States; (4) China Petroleum Pipeline Engineering Co.,Ltd., China
Source title: Society of Petroleum Engineers - Abu Dhabi International Petroleum Exhibition and Conference, ADIP 2021
Abbreviated source title: Soc. Pet. Eng. - Abu Dhabi Int. Pet. Exhib. Conf., ADIP
Part number: 1 of 1
Issue title: Society of Petroleum Engineers - Abu Dhabi International Petroleum Exhibition and Conference, ADIP 2021
Issue date: 2021
Publication year: 2021
Report number: SPE-207617-MS
Language: English
ISBN-13: 9781613998342
Document type: Conference article (CA)
Conference name: 2021 Abu Dhabi International Petroleum Exhibition and Conference, ADIP 2021
Conference date: November 15, 2021 - November 18, 2021

Conference location: Abu Dhabi, United arab emirates
Conference code: 177720
Publisher: Society of Petroleum Engineers
Abstract: Slickwater fracturing technology is one of the significant stimulation measures for the development of unconventional reservoirs. An effective proppant placement in hydraulic fractures is the key to increase the oil production of unconventional reservoirs. However, previous studies on optimizing proppant placement are mainly focused on CFD numerical simulation and related laboratory experiments, and an optimization design method that comprehensively consider multiple influencing factors has not been established. The objective of this study is to establish an optimal design algorithm for proppant placement based on the construction characteristics of slickwater fracturing combined with Back Propagation (BP) neural network. In this paper, a proppant placement simulation experimental device was built to analyze proppant placement form data. We established a BP neural network model that considers multiple influencing factors and used the proppant placement form data to train and calibrate the model, which the proppant placement form prediction model is finally obtained. Using the proppant placement form prediction model, we designed an algorithm that can quickly select the three groups of construction schemes with the best proppant-filling ratio based on the massive construction schemes. The results indicate that the prediction results of the algorithm for proppant placement form are consistent with the CFD simulation results and experimental results, and the numerical error of the balanced height and the distance between the front edge of the proppant sandbank and the fracture entrance is within 5%. After using this algorithm to optimize the design of the fracturing construction scheme for the C8 oil well in Changqing Oilfield, the stimulation performance of the C8 oil well after fracturing is 2.7 times that of the adjacent well. The optimal design algorithm for proppant placement established in this paper is an effective, accurate, and intelligent optimization algorithm. This algorithm will provide a novel method for hydraulic fracturing construction design in oilfields. © Copyright 2021, Society of Petroleum Engineers
Number of references: 21
Main heading: Numerical methods
Controlled terms: Neural networks - Design - Petroleum reservoir engineering - Proppants - Oil wells - Optimal systems - Forecasting - Fracture
Uncontrolled terms: Back-propagation neural networks - Construction scheme - Fracturing construction - Oil-production - Optimal design algorithms - Prediction modelling - Proppant placement - Slickwater fracturing - Stimulation measure - Unconventional reservoirs
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 921.6 Numerical Methods - 951 Materials Science - 961 Systems Science
Numerical data indexing: Percentage 5.00E+00%
DOI: 10.2118/207617-MS
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Funding text: This work was supported by the National Natural Science Foundation of China (Grant No. 51874242, 51934005).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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208. Propagating of Hydraulic Fractures from Horizontal Wellbores: Effects of In-situ Stress and Near Wellbore Stress Redistribution

Accession number: 20231814050388
Authors: Gao, Qian (1, 2); Zhou, Desheng (1); Ghassemi, Ahmad (2); Liu, Xiong (1); Liu, Yafei (1); Guo, Minhao (3)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, China; (2) The University of Oklahoma, United States; (3) Northwest University, Xi'an, China
Corresponding author: Gao, Qian
Source title: SPE/AAPG/SEG Unconventional Resources Technology Conference, URTC 2021
Abbreviated source title: SPE/AAPG/SEG Unconv. Resour. Technol. Conf., URTC
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Issue title: SPE/AAPG/SEG Unconventional Resources Technology Conference, URTC 2021
Issue date: 2021
Publication year: 2021
Report number: URTeC: 5661
Language: English
Document type: Conference article (CA)
Conference name: 2021 SPE/AAPG/SEG Unconventional Resources Technology Conference, URTC 2021

Conference date: July 26, 2021 - July 28, 2021
Conference location: Houston, TX, United states
Conference code: 187237
Publisher: Unconventional Resources Technology Conference (URTEC)
Abstract: As a mature technology to enhance the permeability of geological formations, hydraulic fracturing has widely been utilized in geothermal energy development and in petroleum industry. Due to its effectiveness in practical applications, it attracts many research efforts. Because of the complexity of hydraulic fracturing itself and the complex distribution of stresses around wellbores, accurately describing the behaviors of hydraulic fractures is still a challenging task. We propose a numerical method to simulate arbitrarily propagating of hydraulic fractures from a wellbore, emphases are placed on influences of in-situ stress and near wellbore stress redistribution. In the developed hydro-mechanical model, special considerations are given to its ability to simulate arbitrarily propagating of hydraulic fractures. The propagation of fractures is modelled through the phase-field method. Several cases on hydraulic fracture initiation and propagation from horizontal wellbores are studied through the proposed model. The model has been successfully verified through analytical solutions. The influence of stress redistribution caused by wellbore pressurization on hydraulic fracture initiation from the wellbores is analyzed. Under different in-situ stress configurations and initial fracture orientations (flaws around wellbores are represented by the initial fractures), several patterns of hydraulic fracture propagation around the wellbores are recognized. It is found that the stress redistribution in the close vicinity of wellbores has great influences on the fracture initiation and propagation, it makes hydraulic fractures propagate in non-planar, complex manners. As hydraulic fractures propagate away from the stress redistribution regions around the wellbores, in-situ stress then determines the directions of fracture propagation, the curvature of fracture growth paths is greatly determined by the difference in in-situ stress, for example, #v - #hmin in this study. It has also been demonstrated that, when analyzing fracture propagation from wellbores, the wellbore stability or nonlinear deformation of a wellbore should be considered together with the fracture propagation conditions.
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Number of references: 27
Main heading: Fracture
Controlled terms: Boreholes - Hydraulic fracturing - Numerical methods - Oil field equipment - Oil wells - Petroleum industry - Phase transitions - Resource valuation - Stresses
Uncontrolled terms: Effect of In - Fracture initiation - Fracture propagation - Horizontal wellbores - Initiation and propagation - Insitu stress - Near-wellbore stress - Stress redistribution - Wellbore - Wellbore effects
Classification code: 511.2 Oil Field Equipment - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 801.4 Physical Chemistry - 921.6 Numerical Methods - 951 Materials Science
DOI: 10.15530/urtec-2021-5661
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Database: Compendex
Data Provider: Engineering Village
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209. An Efficient Randomized Low-Rank Matrix Factorization with Application to Robust PCA

Accession number: 20214511119355
Authors: Kaloorazi, Maboud F. (1); Chen, Jie (2); Li, Fei (1); Wu, Dan (1)
Author affiliation: (1) Xi'An Shiyou University, School of Electronic Engineering, Xi'an, China; (2) Northwestern Polytechnical University, School of Marine Science and Technology, Xi'an, China
Source title: Proceedings of 2021 IEEE International Conference on Signal Processing, Communications and Computing, ICSPCC 2021
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Publication year: 2021
Language: English
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Document type: Conference article (CA)

Conference name: 2021 IEEE International Conference on Signal Processing, Communications and Computing, ICSPCC 2021
Conference date: August 17, 2021 - August 19, 2021
Conference location: Xian, China
Conference code: 173100
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Low-rank matrix factorization algorithms using the randomized sampling paradigm have recently gained momentum, owing to their computational efficiency, high accuracy, robustness, and efficient parallelization. This paper presents a randomized factorization algorithm tailored for low-rank matrices, called Randomized Partial UTV (RaP-UTV) factorization. RaP-Utvis efficient in arithmetic operations, and can harness the parallel structure of advanced computational platforms. The effectiveness of RaP-Utvis demonstrated through synthetic and real-world data. Applications treated in this work include image reconstruction and robust principal component analysis. The results of RaP-UTV are compared with those of multiple algorithms from the literature. © 2021 IEEE.
Number of references: 34
Main heading: Computational efficiency
Controlled terms: Image reconstruction - Matrix algebra - Matrix factorization - Principal component analysis
Uncontrolled terms: Background modelling - Dimensionality reduction - Factorization algorithms - Image recovery - Low-rank matrices - Low-rank matrix factorization - Matrix factorizations - Randomized Algorithms - Robust PCA - UTV decomposition
Classification code: 921 Mathematics - 921.1 Algebra - 922.2 Mathematical Statistics
DOI: 10.1109/ICSPCC52875.2021.9564568
Funding Details: Number: 2021GY-168, Acronym: -, Sponsor: -; Number: 2020KJRC0095, Acronym: -, Sponsor: -;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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210. Design and Simulation of Combustion Control System for the Oilfield Water Jacket Heater

Accession number: 20211910343246
Authors: Li, Mao (1); Ji, Xiaoke (1); Zhou, Wangming (1); Liang, Na (1); Liu, Yazhou (1); Xu, Xiangqian (2)
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Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 1385-1388
Article number: 9408915
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The water jacket heating furnace has become the widely used crude oil storage and transportation equipment in the oilfield. And the improvement of its thermal efficiency has become one key issue of energy conservation and emission reduction. The combustion system of the oilfield water jacket heating furnace is designed by combining support vector machine with PID control in this paper. The flow rate of heated medium is predicted by the support vector machine (SVM). According to the flow rate of heated medium, the air and fuel in the heating furnace are optimized to increase thermal efficiency and reduce emissions. Through the calculation and simulation, the response speed of the combustion control system is faster and the thermal efficiency has been improved. © 2021 IEEE.
Number of references: 6

Main heading: Support vector machines
Controlled terms: Combustion - Energy efficiency - Gas emissions - Three term control systems - Oil fields - Emission control - Thermal efficiency - Heating
Uncontrolled terms: Combustion systems - Combustion-control systems - Crude oil storage - Design and simulation - Energy conservation and emission reductions - Oilfield waters - Response speed - Thermal efficiency
Classification code: 451.2 Air Pollution Control - 512.1.1 Oil Fields - 525.2 Energy Conservation - 641.1 Thermodynamics - 641.2 Heat Transfer - 723 Computer Software, Data Handling and Applications - 731.1 Control Systems
DOI: 10.1109/ICSP51882.2021.9408915
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

211. Experimental study on the temperature and structure of the exhaust plume in valveless pulse detonation engines

Accession number: 20212610575845
Authors: Wang, Zhiwu (1); Qin, Weifeng (1); Huang, Jingjing (2); Wei, Lisi (1); Wang, Yafei (1); Zhang, Longfei (1); Liu, Zhi (1)
Author affiliation: (1) School of Power and Energy, Northwestern Polytechnical University, Xi'an; 710072, China; (2) Mechanical Engineering College, Xi'an Shiyou University, China
Corresponding author: Wang, Zhiwu(malsoo@mail.nwpu.edu.cn)
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Issue date: October 2021
Publication year: 2021
Article number: 106907
Language: English
ISSN: 12709638
Document type: Journal article (JA)
Publisher: Elsevier Masson s.r.l.
Abstract: The experiments of multi-cycle detonation were carried out based on a direct-connected pulse detonation engine (PDE) and an air-breathing PDE. The ignition energy was less than 50 mJ generated by a spark plug. The gasoline and air were used as the fuel and oxidizer. The pressure variation along the length of the direct-connected PDE and air-breathing PDE at several different operating frequencies was measured by the piezoelectric pressure sensors. The temperature of the exhaust plume from the PDEs was measured by the temperature and water vapor concentration instrument based on infrared spectrum measurement principle. Meanwhile, the average thrust of the air-breathing PDE with three different nozzles, including convergent nozzle, divergent nozzle, and convergent-divergent nozzle was measured by the force sensor. The experimental results indicated that there was a reflected shock wave propagating upstream when the detonation wave reached the convergent nozzle, while there was no reflected shock wave for the divergent nozzle. The exhaust plume temperature increased slightly with the increasing operating frequency. The exhaust plume temperature of the PDE with the convergent nozzle was lower than that of the divergent nozzle and convergent-divergent nozzle, while the PDE with divergent nozzle obtained the highest exhaust plume temperature. Analogously, the average thrust of PDE with the convergent nozzle was the largest while the PDE with the divergent nozzle obtained the minimum average thrust. The spontaneous flow field of the exhaust plume under the condition of multi-cycle was observed by a high speed camera. Several Mach disks looked like diamonds were generated at the center of exhaust plume and the flow was supersonic for a while. The flow field was similar to that of the supersonic unexpanded free jet. © 2021 Elsevier Masson SAS
Number of references: 34
Main heading: Flow fields
Controlled terms: Supersonic aerodynamics - Shock waves - Pulse detonation engines - Rocket nozzles - High speed cameras - Thermal plumes
Uncontrolled terms: Average thrust - Convergent nozzles - Detonation engines - Divergent nozzles - Experimental study - Mach discs - Pulse detonation - Pulse detonation engine - Temperature and structure of exhaust plume
Classification code: 631.1 Fluid Flow, General - 651.1 Aerodynamics, General - 654.2 Rocket Engines - 742.2 Photographic Equipment - 931 Classical Physics; Quantum Theory; Relativity
Numerical data indexing: Energy 5.00E-02J

DOI: 10.1016/j.ast.2021.106907
Funding Details: Number: 2017009, Acronym: -, Sponsor: -; Number: 91741116, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: CX2020129, Acronym: NPU, Sponsor: Northwestern Polytechnical University; Number: 2017JZ011, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 3102020OMS702, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work was financially supported by the National Natural Science Foundation of China through Grant No. (91741116), the Fundamental Research Funds for the Central Universities through Grant No. 3102020OMS702 , the seed Foundation of Innovation and Creation for Graduate Students in Northwestern Polytechnical University (CX2020129), the Natural Science Foundation of Shaanxi Province of China through Grant No. 2017JZ011 , and Science and Technology Foundation for Selected Overseas Scholar of Shaanxi Province of China (Grant No. 2017009).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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212. Reducing residual oil saturation: Underlying mechanism of imbibition in oil recovery enhancement of tight reservoir

Accession number: 20213610849432
Authors: Xu, Guoqing (1); Han, Yujiao (1); Jiang, Yun (2); Shi, Yang (2); Wang, Mingxian (3); Zeng, XingHang (1)
Author affiliation: (1) Sinopec Research Institute of Petroleum Engineering; (2) Research Institute of Petroleum Exploration and Development, PetroChina, China; (3) Xi'an Shiyou University, China
Corresponding authors: Xu, Guoqing(xgqcup1001@126.com); Jiang, Yun(jiangyun119@petrochina.com.cn); Shi, Yang(shy312@petrochina.com.cn); Wang, Mingxian(wangmingxian@xsyu.edu.cn)
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Issue date: August 2021
Publication year: 2021
Pages: 2340-2351
Language: English
ISSN: 1086055X
CODEN: SPJRFW
Document type: Journal article (JA)
Publisher: Society of Petroleum Engineers (SPE)
Abstract: Spontaneous imbibition (SI) is regarded as an effective method to improve the oil recovery in a tight sandstone reservoir, which leads to a significant change in fracturing design and flowback treatment. However, a longtime shut-in period would aggravate the retention of fracturing fluid, which is in contradiction with high production in the field. It is imperative to understand how SI works during shut-in time, so as to maximize the effect of imbibition in oil recovery enhancement. In this study, a series of experiments were conducted to simulate the status of residual oil saturation so that the inner mechanism of imbibition on oil recovery can be investigated. Low-field nuclear magnetic resonance (LF-NMR) was used to provide direct observation of phase changes in different pore sizes. The experimental results show a positive effect of imbibition on residual oil reduction. This phenomenon further elucidates the observations made during the well shut-in, soaking period, and low flowback efficiency. This study aims to understand the mechanism of SI behavior and help to improve the accuracy of production prediction. © 2021 Society of Petroleum Engineers
Number of references: 43
Main heading: Fracturing fluids
Controlled terms: Hydraulic fracturing - Nuclear magnetic resonance - Petroleum reservoir engineering - Tight gas - Petroleum reservoirs - Pore size
Uncontrolled terms: Different pore sizes - Direct observations - Low field nuclear magnetic resonance (LF NMR) - Oil Recovery enhancements - Production prediction - Residual oil saturation - Spontaneous imbibition - Tight sandstone reservoirs
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.2118/205491-PA
Funding Details: Number: 2020D-5007-0201, Acronym: -, Sponsor: -; Number: 2016ZX05046004, Acronym: -, Sponsor: National Major Science and Technology Projects of China;

Funding text: The study was supported by "National Science and Technology Major Project" (NO. 2016ZX05046004) and "CNPC innovation foundation" (NO. 2020D-5007-0201).
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Database: Compendex
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213. Theoretical study on cave evaluation model based on LWD resistivity imaging tool

Accession number: 20212610567592
Title of translation:
Authors: Kang, Zhengming (1, 2); Ke, Shizhen (3); Li, Xin (4); Ni, Weining (4); Li, Fei (1, 2)
Author affiliation: (1) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) College of Geophysics, China University of Petroleum, Beijing; 102249, China; (4) Sinopec Research Institute of Petroleum Engineering, Beijing; 100101, China
Corresponding author: Kang, Zhengming(190720@xsyu.edu.cn)
Source title: Zhongnan Daxue Xuebao (Ziran Kexue Ban)/Journal of Central South University (Science and Technology)
Abbreviated source title: Zhongnan Daxue Xuebao (Ziran Kexue Ban)
Volume: 52
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Issue date: May 26, 2021
Publication year: 2021
Pages: 1542-1551
Language: Chinese
ISSN: 16727207
CODEN: ZDXZAC
Document type: Journal article (JA)
Publisher: Central South University of Technology
Abstract: The numerical simulation of the response of logging while drilling(LWD) resistivity imaging was realized based on the 3D finite element method. The single-cave and multi-cave formation models were designed respectively, and the influence of cave diameter, cave resistivity and cave extension on the measurement signal was investigated. Furthermore, the imaging sampling process of the tool in the multi-caved formation was simulated to reflect the influence of different factors on the cave. The theoretical calculation models of cave diameter and cave extension were established by using the concept of maximum current contrast. The results show that there is a non-monotonic relationship between the diameter of the cave and the measured signal under the influence of borehole. When the tool is close to the borehole wall, there is a linear relationship between the cave diameter and the measured signal, and there is a better power index relationship between the middle cave extension and the measured signal. At different cave diameters, the resistivity contrast between cave and formation shows a power exponential relationship with the measured signal. © 2021, Central South University Press. All right reserved.
Number of references: 23
Main heading: Caves
Controlled terms: Boreholes - Numerical methods - Logging while drilling
Uncontrolled terms: 3-D finite element method - Evaluation modeling - Linear relationships - Measured signals - Resistivity imaging - Sampling process - Theoretical calculation model - Theoretical study
Classification code: 481.1 Geology - 512.1.2 Petroleum Deposits : Development Operations - 921.6 Numerical Methods
DOI: 10.11817/j.issn.1672-7207.2021.05.015
Funding Details: Number: 2021KW -33, Acronym: -, Sponsor: -; Number: 20JS125, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2021JQ-590, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project; Number: -, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: 2020-07-27 2020-09-10 (Foundation item) (U19B6003U20B2029)(20JS125) (2021KW -33) (2021JQ-590) (Projects(U19B6003, U20B2029) supported by the National Natural Science Foundation of China; Project(20JS125) supported by Scientific Research Program of Education Department of Shaanxi Province; Project(2021KW -33) supported by the Key Research and Development Program of Shaanxi Province; Project(2021JQ-590) supported by the Natural Science Basic Research Plan in ShaanxiProvince) E-mail190720@xsyu.edu.cnProjects(U19B6003, U20B2029) supported by the National Natural Science Foundation of China; Project(20JS125) supported by Scientific Research Program of Education Department of Shaanxi

Province; Project(2021KW-33) supported by the Key Research and Development Program of Shaanxi Province; Project(2021JQ-590) supported by the Natural Science Basic Research Plan in Shaanxi Province.
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Database: Compendex
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214. The CO2-in-water foam stabilized with the mixture of CO2-soluble surfactant and nonionic surfactant

Accession number: 20204909582654
Authors: Zhang, Xuan (1); Zhang, Tianci (1); Ge, Jijiang (1); Wang, Yang (2); Ding, Lei (1); Zhang, Guicai (1)
Author affiliation: (1) College of Petroleum Engineering, China University of Petroleum, Qingdao, China; (2) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an, China
Corresponding author: Zhang, Guicai(zhanggc@upc.edu.cn)
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Article number: 108117
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In recent years, many studies focused on the foam behavior with CO2-soluble surfactants. However, it would be better if the mixing surfactants solution could increase the foam viscosities further and keep the considerable solubility in CO2 comparing with single CO2-soluble surfactant. In this paper, the synergism of the mixture of CO2-soluble surfactant composed of 2 ethoxylated amine headgroups with cocoalkyl tails (C12NEO2) and nonionic surfactant with high degree ethoxylation (C13EO12) was investigated quantitatively by interfacial tension measurement, including micelles in water phase and monolayer at CO2-water interface. Lower critical micelle concentration (CMC) and negative interaction parameters β_{σ} represented the positive synergism clearly after adding nonionic surfactant to the switchable CO2-soluble surfactant. Importantly, the solubility in CO2 and the foam viscosity in porous media were analyzed comparably to confirm the engineering applicability. Even though the C13EO12 is hard to dissolve in CO2 solely, 0.2 wt% surfactants mixture (C13EO12 proportion was lower than 30%) could dissolve in CO2 absolutely to form transparent single-phase at 60 °C and 16 MPa. Limited to the mixture solubility in CO2, which means that the #(C13EO12) 12NEO2:C13EO12 = 8:2, where the bulk foam stability and viscosity increased 1.5 and 2.5 times separately. It was attributed to that the positive synergism leaded to more compact surfactants adsorption layers at the interface, then more stable foam. With increasing brine salinity, the enhancement of foam viscosity diminished to a great extent, while the counter ions in brine could help to get more viscous foam stabilized with C12NEO2 alone. © 2020 Elsevier B.V.
Number of references: 57
Main heading: Carbon dioxide
Controlled terms: Critical micelle concentration - Mixtures - Nonionic surfactants - Porous materials - Micelles - Solubility - Viscosity
Uncontrolled terms: Engineering applicability - Foam behaviors - Foam stability - Lower critical - Negative interaction - Soluble surfactants - Surfactants adsorption - Water interface
Classification code: 631.1 Fluid Flow, General - 801.3 Colloid Chemistry - 801.4 Physical Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 3.00e+01%, Pressure 1.60e+07Pa, Temperature 3.33e+02K
DOI: 10.1016/j.petrol.2020.108117
Funding Details: Number: 2019JM-269, Acronym: -, Sponsor: Natural Science Foundation of Shanxi Province; Number: 2018YFA0702400, Acronym: -, Sponsor: -; Number: 17CX06012, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: 51574266, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES

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215. Seismic Behavior Testing of Joints Reinforced by Sleeves Between Circular CFST Columns and Steel Beams

Accession number: 20212510518216
Title of translation: -
Authors: Bu, Yong-Hong (1); Zhao, Jun-Hai (1); Zhang, Dong-Fang (1); Fan, Jun-Chao (1); Lan, Guan-Qi (2)
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Corresponding author: Bu, Yong-Hong(byh956@126.com)
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Publication year: 2021
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Language: Chinese
ISSN: 10017372
CODEN: ZGXUFN
Document type: Journal article (JA)
Publisher: Chang'an University
Abstract: To solve the hidden danger of joints using single-direction bolts under seismic loads, this paper proposed joints reinforced by sleeves between circular concrete-filled steel tubular (CFST) columns and steel beams. Considering the joint construction and beam-to-column stiffness ratio as the main parameters, ten half-scale joint specimens were designed. The quasi-static test of the specimens under low cyclic reversed loading was completed by employing column end loading. The failure process and failure mode of the specimens were observed, and the hysteretic curve, bearing capacity, ductility and energy dissipation capacity, as well as strength and stiffness degradation of the specimens were analyzed. The damage law differences of the weld and bolt-weld joints reinforced by sleeves and the traditional joints using bolts were systematically compared using different influence factors, and the calculation methods of the ultimate bending moment of the joints were also provided. The test results demonstrate that the failure modes of joints are decided by the joint construction and the stiffness ratio of beams to columns. The bolt-weld joints reinforced by sleeves can prevent the occurrence of bolt relaxation, bolt fracture, and weld cracking and can meet the seismic design requirements of "strong joint, weak member". The connection stiffness and the strength of joints reinforced by sleeves are enhanced, and the joints change from having a semi-rigid connection to a rigid connection, because the moment and shear force are undertaken by both welds and bolts. Compared with the traditional joints using bolts, the joints reinforced by sleeves exhibit higher bearing capacity and safety reserve. Their equivalent viscous damping coefficient, angle ductility coefficient, elastic and elastic-plastic interlayer displacement angle all meet the requirements of the code, and their seismic performance indexes are satisfactory. Moreover, the calculation results of the ultimate bending moment of the joints are in good agreement with the experimental results, indicating that the method can be used for the design and calculation of the proposed joints. © 2021, Editorial Department of China Journal of Highway and Transport. All right reserved.
Number of references: 32
Main heading: Bolts
Controlled terms: Ductility - Seismology - Stiffness - Welds - Concrete beams and girders - Seismic design - Bending moments - Bridges - Elastoplasticity - Bearing capacity - Energy dissipation - Reinforcement
Uncontrolled terms: Concrete filled steel tubular columns - Cyclic reversed loadings - Design and calculation - Ductility and energy dissipation capacities - Ductility coefficient - Equivalent viscous damping coefficient - Interlayer displacements - Strength and stiffness
Classification code: 401.1 Bridges - 408 Structural Design - 408.2 Structural Members and Shapes - 412 Concrete - 484.1 Earthquake Measurements and Analysis - 484.3 Earthquake Resistance - 525.4 Energy Losses (industrial and residential) - 538.2 Welding - 605 Small Tools and Hardware - 951 Materials Science
DOI: 10.19721/j.cnki.1001-7372.2021.05.011
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Funding text: National Natural Science Foundation of China (51878056, 51508028).
Compendex references: YES

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Data Provider: Engineering Village
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216. The study of instrument recognition based on convolutional neural network

Accession number: 20213510848031
Authors: Wang, Ze-Tian (1); Wu, Dan (1); Hua, Le (2); Yan, Su-Li (1); Gao, Zhe (1); Wu, Zhao-Xue (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China; (2) Suzhou Borui Measurement and Control Equipment Co. Ltd, Suzhou, China
Corresponding author: Wu, Dan(wudan@xsyu.edu.cn)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Part number: 1 of 1
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Article number: 9513354
Language: English
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: At present, the digital meter recognition is widely used in the field of power transmission and transformation, but rarely used in the petrochemical industry. This paper combines traditional image processing techniques with deep learning methods and proposes a meter recognition method based on an improved neural network model. By establishing a neural network model architecture, setting up the three convolutional layers and adding a batch normalization processing operation, the digital meters of the oil extraction platform are recognized, and the recognition rate is about 99.17%, which achieve the expectations. Through comparative research, the model constructed in this paper has a higher recognition accuracy and reflects a better recognition effect. © 2021 IEEE.
Number of references: 14
Main heading: Neural network models
Controlled terms: Convolution - Learning systems - Convolutional neural networks - Multilayer neural networks - Deep learning - Image enhancement
Uncontrolled terms: Comparative research - Image processing technique - Instrument recognition - Neural network model - Petrochemical industry - Processing operations - Recognition accuracy - Recognition methods
Classification code: 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence
Numerical data indexing: Percentage 9.92e+01%
DOI: 10.1109/ICMSP53480.2021.9513354
Funding Details: Number: YCS21113138, Acronym: -, Sponsor: -; Number: 2020KJRC0095, Acronym: -, Sponsor: -; Number: 2019GY-100,2021GY-168, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: This project is supported by the Innovation and Practical Ability Cultivation Program for Postgraduates of Xi 'an Shiyou University (YCS21113138), Shaanxi Provincial Key Research and Development Program(2021GY-168), Shaanxi Provincial Key Research and Development Program(2019GY-100) and Xi'an Science and Technology Plan(2020KJRC0095).ACKNOWLEDGMENT This project is supported by the Innovation and Practical Ability Cultivation Program for Postgraduates of Xi 'an Shiyou University (YCS21113138), Shaanxi Provincial Key Research and Development Program(2021GY-168), Shaanxi Provincial Key Research and Development Program(2019GY-100) and Xi 'an Science and Technology Plan(2020KJRC0095).
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217. Dendritic fibrous nanosilica-supported dendritic IL/Ru(ii) as photocatalysts for the dicarbofunctionalization of styrenes with carbon dioxide and amines (*Open Access*)

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Authors: Liu, Can (1); Rouhi, Jalal (2)
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CODEN: RSCACL
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: The effectual utilization of heterogeneous catalysts from nano sources through chemical moderation for the α–aminomethylcarboxylation of alkenes with carbon dioxide and amines is an attractive area to study. Dendritic fibrous nanosilica (DFNS) is a cost-effective, resistant, plenteous, and reproducible source with dandelion-like fibrous anatomy. The present paper is a report on an easy method to provide a family of new DFNS-supported dendritic imidazolium IL/Ru(ii) heterogeneous catalysts DFNS/IL/Ru (1-3) with high ionic density from DFNS. A positive dendritic effect was perceived in the chemical stabilization performance of CO2. DFNS/IL/Ru(ii) was appropriately identified by UV-vis spectroscopy, XPS, SEM, TEM, FT-IR spectroscopy, and TGA. It was discovered that DFNS/IL/Ru(ii) has high catalytic activity for the synthesis of quinoline-2-one through the annulation ofortho-heteroaryl anilines and CO2. DFNS/IL/Ru (3) could be reutilized ten continuous times with no notable reduction in the catalytic activity. Notably, the coveted quinoline-2-one was prepared on a multi-gram scale by deploying DFNS/IL/Ru (3) as a green heterogeneous catalyst. Owing to the attendance of the zwitterionic liquid functional groups on the exterior layer of the bio-based DFNS/IL/Ru (3) catalyst, DFNS/IL/Ru (3) expressed the highest catalytic activity. This approach provides highly functional γ–amino acids in proper yields with great selective power. This paper announces the first nanocatalyst for this transformation, comprising the DFNS-supported Ru N-heterocyclic carbine complex. © The Royal Society of Chemistry 2021.
Number of references: 74
Main heading: Carbon dioxide
Controlled terms: Nanocatalysts - Cost effectiveness - Ultraviolet visible spectroscopy - Aniline - Ruthenium compounds - Styrene - Catalyst activity
Uncontrolled terms: Chemical stabilization - Dendritic effects - Fibrous nanosilica - FTIR spectroscopy - Heterogeneous catalyst - Ionic densities - UV-vis spectroscopy - Zwitterionic liquids
Classification code: 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 911.2 Industrial Economics
DOI: 10.1039/d0ra10729h
Funding Details: Number: UNPYSCT-2018114, Acronym: -, Sponsor: Department of Education, Heilongjiang Province; Number: 2020102254, Acronym: -, Sponsor: -;
Funding text: This work was supported by the Young Talent Innovation Project of the Education Department of Heilongjiang Province of China (Grants No. UNPYSCT-2018114), and the Key Project of College Student Innovation and Entrepreneurship Training Program of Heilongjiang Province of China (Grants No. 2020102254).
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Database: Compendex
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218. Dynamic crypto currency transaction index modelling using blockchain and community detection method

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Authors: Xu, Xiaoyan (1); Zhang, Beibei (2); Lv, Wei (1); Weiwei (2)
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference date: July 23, 2021 - July 25, 2021
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Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In this paper, we propose a macro online transaction trend analysis framework for global crypto currencies by utilizing the dynamic community detection method which is popular and hot in structure analysis of the complex network. The proposed framework includes two major schemas, firstly, method for choosing the representative crypto currencies by utilizing our proposed novel dynamic community detection algorithm, secondly, the dynamic global block-chain transaction situation awareness index model (DGBIM) to analyze and to reflect macro transaction trend of the global online crypto currencies is presented. Compared with classical and offline macro transaction analysis index like GBI, our proposed DGBI model yields fairly good results on huge amount of real crypto currency transaction data crawled from mainstream online trading markets such as 'feixiaohao', 'okcoin', and 'Huobi'. © 2021 IEEE.
Number of references: 16
Main heading: Complex networks
Controlled terms: Population dynamics - Blockchain
Uncontrolled terms: Community detection - Dynamic communities - Online trading - Online transaction - Situation awareness - Structure analysis - Transaction data - Trend analysis
Classification code: 722 Computer Systems and Equipment - 723.3 Database Systems - 971 Social Sciences
DOI: 10.1109/ICMSP53480.2021.9513352
Funding Details: Number: 2018YFB0203900,2018YFB0203901, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China; Number: -, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
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Database: Compendex
Data Provider: Engineering Village
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219. Simulation analysis of EMAT shear wave in pipeline and research of defect detection characteristics

Accession number: 20213510848002
Authors: Wu, Jie (1); Wang, Chiyu (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Ministry of Education, Key Laboratory Photoelectric Logging and Detecting, Xi an, China
Corresponding author: Wang, Chiyu(379719690@qq.com)

Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Article number: 9513224
Language: English
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: According to the principle of electromagnetic Acoustic transducer (EMAT), the propagation characteristics of electromagnetic ultrasonic shear wave in pipeline are analyzed by using the finite element analysis software COMSOL. Based on the study of the acoustic field characteristics of the ultrasonic shear wave, a finite element model with bubble defects was established, and the ultrasonic response characteristics of the inner and outer walls of the pipe with defects were simulated and analyzed, and compared with those of the pipe without defects. Then the simulation analysis of the defects of different sizes and different positions is carried out, and the relationship between the size, position, defect echo, defect transmission wave and time is obtained, which lays a foundation for the quantitative and location monitoring of pipeline bubble defects. The possibility of electromagnetic ultrasonic body wave in oil pipeline flaw detection is verified. © 2021 IEEE.
Number of references: 5
Main heading: Defects
Controlled terms: Acoustic emission testing - Finite element method - Acoustic fields - Ultrasonic testing - Pipelines - Shear flow - Shear waves
Uncontrolled terms: Electromagnetic acoustic transducers - Finite element analysis software - Location monitoring - Propagation characteristics - Simulation analysis - Ultrasonic body waves - Ultrasonic response - Ultrasonic shear waves
Classification code: 619.1 Pipe, Piping and Pipelines - 631.1 Fluid Flow, General - 751 Acoustics, Noise. Sound - 751.2 Acoustic Properties of Materials - 753.3 Ultrasonic Applications - 921.6 Numerical Methods - 931.1 Mechanics - 951 Materials Science
DOI: 10.1109/ICMSP53480.2021.9513224
Compendex references: YES
Database: Compendex
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220. Post-stack diffraction imaging based on pathintegral

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Title of translation:
Authors: Li, Qin (1, 2); Shen, Hongyan (1, 2); Wang, Xin (1, 2); Zhao, Jing (1, 2); Li, Meng (1, 2)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an; 710065, China
Corresponding authors: Shen, Hongyan(shenhongyan@xsyu.edu.cn); Shen, Hongyan(shenhongyan@xsyu.edu.cn)
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Language: Chinese

ISSN: 02539993
CODEN: MTHPDA
Document type: Journal article (JA)
Publisher: China Coal Society
Abstract: Diffracted waves are seismic responses caused by local heterogeneities of underground strata, which carry high-resolution heterogeneous information. The key to identify and track the heterogeneous body (or region) by diffractions is to accurately image them. A post-stacked diffraction migration imaging method based on path integral has been developed. Firstly, a migration filter in f-k domain is constructed by combining the path integral theory with the analytical solution of the isotropic zero migration velocity continuation partial differential equation. Then, the filtering characteristics are varied according to the integral interval (velocity). Finally, the post-stacked diffraction imaging is achieved after using an amplitude and phase control in the f-k domain to highlight the top of the diffraction arc and weaken the steep wings of the diffraction event. In addition, a Gaussian weighting factor is introduced into the filter to suppress the tail-line interferences and improve the imaging quality, and a selection principle of imaging control parameters is also discussed. The results show that this imaging process is equivalent to a continuous summation of all constant velocity continuation sections in a given velocity range. It accumulates stable contribution to boost the energy of the diffraction arc apex, and simultaneously offsets the wings of the event by continuous phase shifting. However, the migration components caused by interval endpoints cannot be offset in this way, which may lead to residual events under and over migrated in the imaging results. To suppress the tail lines and converge the diffraction event, a Gaussian factor can be introduced into the filter. The Gaussian weight can enhance the contribution near the accurate velocity and diminish the migration components caused by wrong velocities. Moreover, for the Gaussian method, the endpoint values on both sides of the velocity interval correspond respectively to the under and over migration components in the imaging section. The size of the velocity range is directly proportional to the energy of the migrated event apex. The focusing degree of diffraction points is determined by the velocity bias and standard deviation. Two theoretical diffraction models verified the effectiveness of this method. The processed results of real seismic data sets show that this method does not need to build an imaging velocity model in advance, and it can effectively improve the imaging quality under the premise of complete extraction of diffracted waves. © 2021, Editorial Office of Journal of China Coal Society. All right reserved.
Number of references: 44
Main heading: Velocity
Controlled terms: Diffraction - Gaussian distribution - Image processing - Integral equations - Quality control - Quantum theory
Uncontrolled terms: Diffracted waves - Diffraction arcs - Diffraction imaging - F-k domain - Gaussians - Heterogeneous body(or region) - Imaging quality - Path integral - Seismic imaging - Velocity continuation
Classification code: 723.2 Data Processing and Image Processing - 913.3 Quality Assurance and Control - 921.2 Calculus - 922.1 Probability Theory - 922.2 Mathematical Statistics - 931.4 Quantum Theory; Quantum Mechanics
DOI: 10.13225/j.cnki.jccs.2020.1360
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221. High Figure of Merit and Low Cross Sensitivity Fiber Bragg Grating Accelerometer Based on Double Grid-Diaphragms

Accession number: 20214511129616
Authors: Liu, Qinpeng (1); Liu, Wangfei (1); Wang, Chunfang (1); Zhang, Rong (1); Fan, Wei (2); Yu, Dakuan (2); Qiao, Xueguang (2)
Author affiliation: (1) Ministry of Education, Key Laboratory on Photoelectric Oil-Gas Logging and Detecting, School of Science, Key Laboratory of PetroChina LoggingCompany, Xi'an Shiyou University, Xi'an; 710065, China; (2) Ministry of Education, Key Laboratory on Photoelectric Oil-Gas Logging and Detecting, School of Science, Xi'an Shiyou University, Xi'an; 710072, China
Corresponding author: Liu, Wangfei(bwllwf72@163.com)
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Language: English

ISSN: 1530437X
E-ISSN: 15581748
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Use of a detailed parallel theoretical model has allowed the design of a high figure of merit and low cross sensitivity accelerometer based on fiber Bragg grating (FBG), and the good response characteristics have been demonstrated experimentally. The relationship between the sensitivity and resonant frequency is downplayed, the mechanism of expanding the frequency band and maintaining higher sensitivity has been analyzed. A FBG accelerometer with a good performance of higher main-axis sensitivity and lower cross sensitivity has been presented. The experimental results obtained indicate that the FBG accelerometer has a broad frequency range from 1 to 60Hz, the corresponding sensitivity range from 754.3 to 763.2pm/G, while the fluctuation is less than 3dB. The resonant frequency is 103Hz, and the corresponding cross sensitivity is less than -24.76dB (© 2001-2012 IEEE.
Number of references: 28
Main heading: Natural frequencies
Controlled terms: Accelerometers - Fiber Bragg gratings - Petroleum prospecting
Uncontrolled terms: Cross sensitivity - Fiber bragg grating - Fiber bragg grating accelerometer - Fiber gratings - High figure of merit - High sensitivity - Performance - Response characteristic - Sensitivity - Theoretical modeling
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 943.1 Mechanical Instruments
Numerical data indexing: Decibel -2.476E+01dB, Decibel 3.00E+00dB, Frequency 1.00E00Hz to 6.00E+01Hz, Frequency 1.03E+02Hz, Percentage 5.00E+00%, Size 7.543E-10m to 7.632E-10m, Size 7.861E-08m
DOI: 10.1109/JSEN.2021.3124030
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222. Microstructure and mechanical properties of the Ag/316L composite plate fabricated by explosive welding

Accession number: 20210509867569
Authors: Zhao, Hui (1); Sheng, Liyuan (2)
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Corresponding author: Sheng, Liyuan(lysheng@yeah.net)
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Language: English
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Document type: Journal article (JA)
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Abstract: In the present research, the Ag/316L composite plate was fabricated by the explosive welding. Its microstructure and mechanical properties were studied and the results reveal that the explosively welded Ag/316L composite plate has typical interfacial wavy structure which has the average period of 900 μm and average height of 400 μm. Along the Ag/316L composite interface, the transition layer, melted region and Ag rich layer are formed discontinuously. The γ–Fe particles are enveloped in the melted region with relatively homogeneous distribution. Moreover, some Fe2O3 oxides are formed in the melted region. The violent collision by explosive welding has resulted in great deformation in the region adjacent to the interface, which promotes the thorough recrystallization in Ag side and abundant substructures in 316L stainless steel side. Such a microstructure evolution increases the microhardness

of the area adjacent to the interface. The Ag/316L composite plate exhibits good bending properties without any interfacial crack, but the discontinuously distributed oxides are formed along the interface, which would be detrimental to the deformability by acting as the crack nucleation. The Ag/316L composite plate possesses the average yield strength, ultimate tensile strength and elongation of 350 MPa, 690 MPa and 39 %, respectively. And its average shear strength is 177 MPa. Such mechanical properties should be attributed its good interfacial structure and refined grains.
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Number of references: 56
Main heading: Microstructure
Controlled terms: Cracks - Explosive welding - Deformation - Hematite - Explosives - Plates (structural components) - Fabrication - Tensile strength
Uncontrolled terms: 316 L stainless steel - Bending properties - Homogeneous distribution - Interfacial cracks - Interfacial structures - Micro-structure evolutions - Microstructure and mechanical properties - Ultimate tensile strength
Classification code: 408.2 Structural Members and Shapes - 482.2 Minerals - 538.2.1 Welding Processes - 951 Materials Science
Numerical data indexing: Percentage 3.90e+01%, Pressure 1.77e+08Pa, Pressure 3.50e+08Pa, Pressure 6.90e+08Pa, Size 4.00e-04m, Size 9.00e-04m
DOI: 10.1016/j.jmapro.2021.01.026
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223. Eccentric array-based borehole transient electromagnetic system for NDT of multipipe strings in sidetrack well (*Open Access*)

Accession number: 20212110398101
Authors: Ling, Yang (1); Ruirong, Dang (1); Bo, Dang (1); Rui, Guo (1)
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Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In the middle and late stage of oilfield development, the sidetracking technology is widely used for restoring the production of stripper well, damaged well and abandoned well. In this paper, we present an eccentric array-based borehole transient electromagnetic (TEM) system for nondestructive testing (NDT) of multipipe strings in sidetrack well. Using the borehole TEM signal model, the response of eccentric sensor is analyzed, which contains more information in the direction of eccentricity. On this basis, multiple eccentric sensors with different depths and different angles are utilized to form an eccentric array, which can be used to determine the direction of sidetracking and to detect the multiple pipes in hanging casing strings. The performance of the proposed system was verified by applying it to sidetrack wells in Shengli oilfield. In addition, field experiments were conducted, and the results demonstrated the effectiveness of the proposed method. © Published under licence by IOP Publishing Ltd.
Number of references: 13
Main heading: Nondestructive examination
Controlled terms: Oil field development - Transient analysis - Well testing - Oil wells - Boreholes
Uncontrolled terms: Casing strings - Field experiment - Shengli Oilfield - Sidetrack well - Sidetracking technology - Signal modeling - Stripper wells - Transient electromagnetic systems
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations
DOI: 10.1088/1742-6596/1894/1/012050
Funding Details: Number: YCS19211002, Acronym: -, Sponsor: -; Number: 2020KJXX-018, Acronym: -, Sponsor: -; Number: 41874158,51974250, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
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224. High Temperature Low Cycle Fatigue Characteristics of Steam Turbine Rotor Steel 10%Cr

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Title of translation: 10%Cr
Authors: Cui, Lu (1); Kangwenquan (1); Zou, Fang (1); Weiwenlan (1); Li, Zhen (1); Wang, Peng (2)
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Language: Chinese
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Abstract: High temperature low cycle fatigue performance of the ultra-supercritical steam turbine rotor steel 10%Cr was studied by controlling the strain and temperature, as well as the characterization of surface morphology and sub-grain structure with SEM and TEM for the steel before and after test. Based on the experimental data the Ramberg-Osgood parameters and Manson-Coffin parameters of the high temperature and low cycle fatigue characteristics of the material were obtained through fitting the stress-strain curves, stress-life curves and strain-life curves. The hysteresis loops and stress-life curves in the initial and final phases of the high temperature low cycle fatigue experiment were analyzed comparatively in terms of the relation between plastic strains with temperature and strain amplitude. Results show that the plastic strain of steel 10%Cr is much obvious under high temperature conditions, and the fatigue life of the material decreases with the increasing strain amplitude. The plastic strain rate experienced three stages with the fatigue cycle, namely the falling stage-the transition stage-the rising stage, and the plastic strain rate has an inflection point with the variation of fatigue cycles. The maximum crack length varied nonlinearly with the number of cycles, and as a result of the high temperature and low cycle fatigue process, the size of sub-grains of the steel increases. © 2021, Editorial Office of Chinese Journal of Materials Research. All right reserved.
Number of references: 36
Main heading: Plastic deformation
Controlled terms: Curve fitting - Strain rate - Morphology - Surface morphology - Low-cycle fatigue - Stress-strain curves - Cracks
Uncontrolled terms: High temperature condition - High temperature low cycle fatigues - Inflection points - Low cycle fatigues - Ramberg-Osgood parameters - Steam turbine rotor - Subgrain structures - Supercritical steam turbines
Classification code: 921.6 Numerical Methods - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.11901/1005.3093.2020.283
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Funding text: Supported by National Natural Science Foundation of China (No. 51305348), the Youth Innovation Team of Xi'an Shiyou University (No. 2019QNKYCXTD10) and Xi'an Shiyou University Graduate Innovation and Practice Ability Development Program (No. YCS19113058)Correspondent: W ANG Peng, T el : 13730170648, E-mail: wp168@hotmail.com Supported by National Natural Science Foundation of China (No. 51305348), the Y outh Innovation T eam of Xi'an Shiyou University (No. 2019QNKYCXTD10) and Xi'an Shiyou University Graduate Innovation and PracticeAbility Development Program (No. YCS191 13058) Manuscript received 2020-07-12, in revised form 2020-09-18
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225. Erratum: Dendritic fibrous nanosilica-supported dendritic IL/Ru(ii) as photocatalysts for the dicarbofunctionalization of styrenes with carbon dioxide and amines (RSC Advances (2021) 11 (9933–9941) DOI: 10.1039/D0RA10729H) (*Open Access*)

Accession number: 20212710592949
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Corresponding authors: Liu, Can(liucanxk@126.com); Rouhi, Jalal(jalalrouhi@gmail.com)
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Document type: Erratum (ER)
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226. Designing a Teaching Assistant System for Physical Education Using Web Technology (*Open Access*)

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Authors: Qi, Shiyuan (1); Li, Shoubang (1); Zhang, Jing (1)
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Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: An efficient and effective management is mandatory for the success of every organization, especially educational institutes. Following the course curriculum and completing it in time are beneficial for the students and the colleges' reputation in educational institutes. In this paper, intelligent management of physical education curriculum is designed using a Web-based teaching assistant system. The multilayer designed system provides convenience for teachers and students of health and physical education. The data layer collects input data from users and transmits it to the storage layer after being compiled by the decoder. The layer uses memory to save the transmitted data and integrate the saved data into the expansion chip and transmit it to the transmission layer. The Web server at this layer outputs the transmitted data in the form of an HTML structure file through a CGI program and feeds back the output to the browser of the application layer. The man-machine interaction interface of the application layer uses a large-scale hierarchical information visualization method to show data on the browser to users. The experimental results show that the system has comprehensive functions, fast processing speed, and low energy consumption. It has a good page display effect, which is in line with the user's visual cognition; the recall rate of curriculum scheduling data and curriculum selection data is always higher than 96%, and the data analysis ability is excellent. © 2021 Shiyuan Qi et al.
Number of references: 23
Main heading: Curricula
Controlled terms: Information systems - Data visualization - Application programs - Digital storage - Information use - Students - Energy utilization
Uncontrolled terms: Educational Institutes - Effective management - Hierarchical information - Intelligent management - Low energy consumption - Physical education - Teaching assistants - Transmission layers
Classification code: 525.3 Energy Utilization - 722.1 Data Storage, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 901.2 Education - 903.2 Information Dissemination - 903.3 Information Retrieval and Use
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227. Microstructure evolution and mechanical properties of x6crnimovnb11-2 stainless steel after heat treatment (*Open Access*)

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Publisher: MDPI
Abstract: X6CrNiMoVNb11-2 supermartensitic stainless steel, a special type of stainless steel, is commonly used in the production of gas turbine discs in liquid rocket engines and compressor disks in aero engines. By optimizing the parameters of the heat-treatment process, its mechanical properties are specially adjusted to meet the performance requirement in that particular practical application during the advanced composite casting-rolling forming process. The relationship between the microstructure and mechanical properties after quenching from 1040C and tempering at 300–670C was studied, where the yield strength, tensile strength, elongation and impact toughness under different cooling conditions are obtained by means of mechanical property tests. A certain amount of high-density nanophase precipitation is found in the martensite phase transformation through the heat treatment involved in the quenching and tempering processes, where M23C6 carbides are dispersed in lamellar martensite, with the close-packed Ni3Mo and Ni3Nb phases of high-density co-lattice nanocrystalline precipitation created during the tempering process. The ideal process parameters are to quench at 1040C in an oil-cooling medium and to temper at 650C by air-cooling; final hardness is averaged about 313 HV, with an elongation of 17.9%, the cross-area reduction ratio is 52%, and the impact toughness is about 65 J, respectively. Moreover, the tempered hardness equation, considering various tempering temperatures, is precisely fitted. This investigation helps us to better understand the strengthening mechanism and performance controlling scheme of martensite stainless steel during the cast-rolling forming process in future applications. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.
Number of references: 58
Main heading: Hardness
Controlled terms: Binary alloys - Aircraft engines - Chromium alloys - Cooling - Microstructure - Quenching - Carbides - Fracture toughness - Martensite - Nanocrystals - Rockets - Niobium alloys - Tempering - Molybdenum alloys - Tensile strength
Uncontrolled terms: Martensite phase transformation - Martensite stainless steel - Micro-structure evolutions - Microstructure and mechanical properties - Performance requirements - Quenching and tempering - Strengthening mechanisms - Supermartensitic stainless steels
Classification code: 531.2 Metallography - 537.1 Heat Treatment Processes - 543.1 Chromium and Alloys - 543.3 Molybdenum and Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 641.2 Heat Transfer - 653.1 Aircraft Engines, General - 654.1 Rockets and Missiles - 761 Nanotechnology - 804.2 Inorganic Compounds - 812.1 Ceramics - 933.1 Crystalline Solids - 951 Materials Science
Numerical data indexing: Energy 6.50e+01J, Percentage 1.79e+01%, Percentage 5.20e+01%
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228. A Model for the Deposition of Scale Crystals on the Surface of Clay Particles (*Open Access*)

Accession number: 20210910008878
Authors: Yu, Tao (1, 2); Song, Jiayu (3); Yan, Yan (1, 2); Wu, Baichun (3); Qu, Chengtun (1, 2)
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Publisher: IOP Publishing Ltd
Abstract: Deposition and aggregation of scale on microbial surface leads to poor stabilization of the treatment of oilfield high-scale oily wastewater. To study the deposition characteristics of scale on the surface of microbial particles, we perform the deposition and aggregation of calcium sulfate on the surface of clay particles as simulators of microbes and establish the deposition-aggregation process model. According to the theory of crystal growth, the diffuse electric double layer theory for clay, and the charged colloid theory, the scale deposition model can be divided into induction period, formative period of scale crystal nucleation, and crystal growth period. When calcium sulfate crystals deposit and aggregate on the surface of clay particles, the zeta potential and the average particle size on the surface of the clay particles increase continuously over time and tend to increase and decrease in cycles. The scale crystals are wrapped divergently around the surface of the clay particles in a needle-like form, such that the clay suspension is in a state of high aggregation. Logarithmic value of the conductivity in the formation of scale crystal has a good linear relationship with time, which conforms to the first-order rate equation. Conductivity curves can better reflect the deposition course of scale crystal on the surface of clay particles, which is divided into the induction period (6 min), transition period (1.5 min), formative period of scale crystal nucleation (10.75 min), rapid growth period of scale crystal (8.5 min), slow growth period of scale crystal (14.75 min), and stationary phase (4.75 min), and with the formation of the scale crystal, the deposition rate constant decreases gradually from 0.00945 min-1 to 0.0001 min-1. The results uncovered that Deposition and aggregation rules of scale on the surface of clay particles and the basis for further studying on microbial surface. © Published under licence by IOP Publishing Ltd.
Number of references: 24
Main heading: Agglomeration
Controlled terms: Aggregates - Particle size - Nucleation - Rate constants - Deposition rates - Calcium sulfate - Suspensions (fluids)
Uncontrolled terms: Aggregation process - Average particle size - Crystal nucleation - Deposition characteristics - Electric double layer - First order rate equation - Linear relationships - Theory of crystal growth
Classification code: 406 Highway Engineering - 412.2 Concrete Reinforcements - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 933.1.2 Crystal Growth
Numerical data indexing: Time 2.85e+02s, Time 3.60e+02s, Time 5.10e+02s, Time 6.45e+02s, Time 8.85e+02s, Time 9.00e+01s
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Open Access type(s): All Open Access, Bronze
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229. Application of three-component acoustic emission sensor in the uniaxial compression rock failure experiment

Accession number: 20220411504145
Authors: Wu, Shan (1); Ge, Hongkui (2); Wang, Xiaoqiong (2); Li, Tiantai (3); Gao, Ke (1)
Author affiliation: (1) Southern University of Science and Technology, Shenzhen, China; (2) China University of Petroleum (Beijing), Beijing, China; (3) Xi'an Shiyou University, Xi'an, China
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Volume: 3
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Publisher: American Rock Mechanics Association (ARMA)
Abstract: In rock mechanics laboratory experiments, single-component acoustic emission sensors are commonly employed to monitor the failure process of rock, and from which basic information such as fracture types and location can be extracted. However, the spatial information of particle vibration is usually missing, and also the polarization of single-component signal cannot be analyzed. All these render it difficult to make comprehensive analyses of acoustic emission waveforms and thus hinder the understanding of the mechanical properties of rupture sources. Since polarization analysis of data from three-component sensors can enhance the classification of multiple coupling waveforms, it is of great significance to investigate their applicability in acoustic emission analysis of fracture propagation in rock failure experiments. In this paper, we use a new type of three-component sensors in acoustic emission monitoring. Our results show that it provides more detailed information for understanding the dynamic fracture propagation in tight reservoir rocks. © 2021 ARMA, American Rock Mechanics Association
Number of references: 32
Main heading: Rock mechanics
Controlled terms: Acoustic emission testing - Acoustic emissions - Fracture - Rocks - Vibration analysis - Polarization
Uncontrolled terms: Acoustic emission sensors - Failure process - Fracture propagation - Laboratory experiments - Mechanics laboratory - Rock failures - Single components - Three-component - Uni-axial compression - Waveforms
Classification code: 483.1 Soils and Soil Mechanics - 751.2 Acoustic Properties of Materials - 951 Materials Science
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230. The study of enhanced displacement efficiency in tight sandstone from the combination of spontaneous and dynamic imbibition

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Authors: Dou, Liangbin (1, 2); Xiao, Yingjian (3); Gao, Hui (1, 2); Wang, Rui (1, 2); Liu, Chenglu (1, 2); Sun, Hengbin (1, 2)
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Article number: 108327
Language: English
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Abstract: Spontaneous imbibition is critical in the oil recovery process for low permeability and tight reservoirs, which is driven by the capillary pressure. In the waterflooding process, dynamic imbibition has been determined as an important means of oil recovery for ultra-low permeability reservoirs. It functions significantly to the oil recovery in cyclic water injection. Unfortunately, some mechanisms are not fully understood within the spontaneous and dynamic imbibition such as the effect of pore size on imbibition and their collaboration on oil recovery. In this paper, three micro mechanisms were studied to understand their effects on oil recovery efficiency: spontaneous imbibition, dynamic imbibition and the combination of spontaneous and dynamic imbibition. The Nuclear Magnetic Resonance (NMR) technique was applied to investigate the sandstone formation of Yanchang group in Ordos basin. First, we analyzed the T2 spectrum characteristics of tight sandstone, by which the pore size was grouped into three along with the high-pressure mercury injection data. Second, we studied the quantitative effect of imbibition time and interfacial tension on the oil recovery efficiency of tight sandstone, with respect to various pore sizes during the spontaneous imbibition process. Simultaneously, the effect of interfacial tension on dynamic imbibition was evaluated at various pore sizes by means of displacement experiments and low-field NMR. Third, we proposed the methodology of the utilization of spontaneous and dynamic imbibition to enhance the displacement efficiency in tight sandstone, based on their characteristics. Meanwhile, the displacement characteristics were compared at various pore sizes from the three imbibition types. A feasible workflow was provided for field applications to enhance oil recovery by means of spontaneous and dynamic imbibition. This research fills the gap of waterflooding in tight sandstone and low permeability reservoirs and improves the waterflooding technique. © 2020 Elsevier B.V.
Number of references: 46
Main heading: Pore size
Controlled terms: Nuclear magnetic resonance - Petroleum reservoir engineering - Dynamics - Efficiency - Low permeability reservoirs - Tight gas - Oil well flooding - Sandstone
Uncontrolled terms: Displacement characteristic - Displacement efficiency - Displacement experiments - Enhance oil recoveries - Nuclear magnetic resonance techniques - Oil recovery efficiency - Spontaneous imbibition - Ultra-low permeability reservoirs
Classification code: 482.2 Minerals - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
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231. Carbonate cementation patterns and diagenetic reservoir facies of the triassic Yanchang Formation deep-water sandstone in the huangling area of the Ordos Basin, northwest China

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Abstract: The Chang 6 member sandstone is one of the main oil reservoirs of the Ordos basin, China, and consists of a lacustrine gravity flow deposited in Huangling area. Carbonate cement is volumetrically the most important diagenetic parameter controlling reservoir quality in the sandstones. Three generations of carbonate cements were recognized. The massive microcrystalline calcite, poikilotopic calcite and microcrystalline dolomite from the supersaturated alkaline pore water precipitate with basement cements at an early diagenesis stage. The ferroan calcite is mainly pore-filling and replacement cementation in the middle diagenesis stage, and ferroan dolomite is pore-filling cementation in the late diagenesis stage. The four types of reservoir facies and the distribution patterns were identified in the Chang 6 member sandstones. (1) Massive carbonate cemented facies with high contents of carbonate cements are distributed along the edges of the sandstone bodies, which are in the channels of the turbidite and sandy debris flow deposits. (2) Partial carbonate cemented facies occur along the margins of the massive carbonate cemented facies. (3) The porous facies with the lowest percentages of carbonate cements in sandstone are distributed in the middle of the sand-bodies of the sandy debris flow deposits. (4) High muddy debris facies that have high percentages of carbonate-cemented and high muddy debris sandstones occur essentially in the proximal overbank and lobe of the turbidite deposits.
The reservoir quality of sandstones depended upon time of precipitation of carbonate cements on and diagenetic processes. Massive carbonate cements and the high muddy debris of sandstones undergo lots of carbonate cements and strong compaction in the early diagenesis stage, respectively. There was weak water rock reaction of dissolution in the later diagenesis process. Partial carbonate cemented facies and the porous facies of sandstones have sufficient water rock reaction and more dissolution pores. © 2021 Elsevier B.V.
Number of references: 30
Main heading: Sandstone
Controlled terms: Cementing (shafts) - Sedimentology - Deposits - Petroleum reservoir engineering - Debris - Dissolution - Petroleum reservoirs - Calcite - Carbonation - Cements
Uncontrolled terms: Carbonate cement - Carbonate cementation - Diagenetic reservoir facies - Early diagenesis - Lacustrine deep-water sandstone - Microcrystallines - Ordos Basin - Pore filling - Reservoir quality - Yanchang Formation
Classification code: 412.1 Cement - 481.1 Geology - 482.2 Minerals - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.2 Inorganic Compounds
DOI: 10.1016/j.petrol.2021.108608
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Compendex references: YES
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Data Provider: Engineering Village
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232. Seismic Signal Filtering based on Pseudo Wigner-Ville Distribution and Catte Model (*Open Access*)

Accession number: 20212110398109
Authors: Yanping, Liu (1); Zheng, Ma (1); Huiqin, Jia (1); Jianshen, Gao (1)
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In practice, there are various noises included in the collected seismic data. As a common background noise, random noise may interfere even annihilate valid signals. In view of this, it needs to adopt effective methods to eliminate random noise as much as possible. This paper proposes a filtering method that is based on pseudo Wigner-Ville distribution (PWVD) and Catte model. PWVD is a windowed form of Wigner-Ville distribution (WVD) which can make the nonlinear signal to be locally linearized in addition to weakening the influence of cross item. And the Catte model is a kind of anisotropic diffusion algorithm which can eliminate the noise while protecting the edge of image. The implementation of the proposed method is to do PWVD for the frequency modulation form of noise-containing signal and then to filter the PWVD via Catte model, at last to adopt peak search to obtain the estimation of the valid signal. © Published under licence by IOP Publishing Ltd.
Number of references: 17
Main heading: Wigner-Ville distribution
Controlled terms: Edge detection - Seismology - Seismic waves - Frequency estimation
Uncontrolled terms: Anisotropic Diffusion - Background noise - Filtering method - Nonlinear signals - Peak searches - Seismic datas - Seismic signals - WignerVille distribution (WVD)
Classification code: 484 Seismology - 484.1 Earthquake Measurements and Analysis - 922 Statistical Methods
DOI: 10.1088/1742-6596/1894/1/012058
Funding Details: Number: YCS20213166, Acronym: -, Sponsor: -; Number: 41704106, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: S2018-JC-QN-1235, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This research is supported by the National Natural Science Foundation of China with Grant No. 41704106, the Basic Research Plan of Natural Science in Shaanxi Province with Grant No. S2018-JC-QN-1235 and Postgraduate Innovation and Practical Ability Training Program of Xi'an Shiyou University with No. YCS20213166.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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233. Model construction of complex thin-wall structure parts for adaptive machining

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Title of translation:

Authors: Feng, Yazhou (1); Ren, Junxue (2); Liu, Zhanfeng (1); Han, Xiaolan (1)
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Language: Chinese
ISSN: 10006893
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Publisher: Chinese Society of Astronautics
Abstract: With continuous improvement of manufacturing concepts and levels, a large number of near-net-shape blades produced by multi-manufacturing technologies have been applied to in-service or in-development aero-engine. However, by the reason of typical complex thin-walled structure parts, no accurate positioning datum and poor forming consistency of the precision forging blade, the machined leading edge and trailing edge, blade tenon shape and the positional accuracy are generally difficult to be guaranteed using the pressure and suction surfaces with variant shapes as the positioning references, which leads to poor consistency, low pass rate, and easy out-of-tolerance of final productions. In order to solve the above problems, a model construction method of complex thin-wall structure parts for adaptive machining is proposed. Firstly, a distribution model of sampling points on complex surface is established to quickly obtain the position and shape of the precision forged blade. Secondly, a model reconstruction algorithm is proposed based on the similar deformation of the characteristic curve, in order to reconstruct the geometry model of the inexact molding area at the leading edge and trailing edge. Finally, this approach is verified by adaptive machining of precision forged blade. The results show that this method can effectively meet the requirements of the adaptive machining of complex thin-wall structure parts represented by precision forged blades. © 2021, Beihang University Aerospace Knowledge Press. All right reserved.
Number of references: 22
Main heading: Thin walled structures
Controlled terms: Aircraft engines
Uncontrolled terms: Adaptive machining - Continuous improvements - Digital measurement - Leading/trailing edge - Manufacturing concepts - Model construction - Precision forged blade - Structure parts - Thin-wall structures - Trailing edges
Classification code: 653.1 Aircraft Engines, General
DOI: 10.7527/S1000-6893.2021.24820
Funding Details: Number: HPM-2020-03, Acronym: -, Sponsor: -;
Funding text: Major Basic Research Programs on Aero-Engine and Gas Turbine (VII-0001-0141); Open Project Fund of Key Laboratory of Aeroengine High Performance Manufacturing of Ministry of Industry and Information Technology (HPM-2020-03).
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Data Provider: Engineering Village
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234. A signal reconstruction method for memory-type transient electromagnetic detection systems in horizontal wells

Accession number: 20213510848125
Authors: Bo, Dang (1); Mengmeng, Peng (1); Bowen, Ren (1); Ling, Yang (1)
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Issue date: July 23, 2021
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: A signal reconstruction method for memory-type transient electromagnetic detection systems based on empirical mode decomposition (EMD) was proposed in this study to tackle with the large volume of data saved by the electromagnetic flaw detector in horizontal wells. First, based on the underground transient electromagnetic detection model, sparse representation was performed for the depth-dimensional transient electromagnetic detection signal, which was then projected through a Gaussian random measurement matrix. Next, a depth-directional observation matrix was built to reconstruct the underground transient electromagnetic signal. In addition, in order to improve the reconstruction precision, the baseline wander of underground transient electromagnetic detection signal was removed through EMD, the key information of casing pipe was described using intrinsic mode functions (IMFs), and the IMFs were constructed using the above compressive sensing algorithm. It is verified through the measured data that the compressed signal after the baseline removal can be recovered at a higher probability, and moreover, it can accurately describe the forms of casing pipes and effectively remit the storage problem of large data volume faced by the memory-type electromagnetic flaw detectors in horizontal wells. © 2021 IEEE.
Number of references: 15
Main heading: Empirical mode decomposition
Controlled terms: Horizontal wells - Transient analysis - Matrix algebra - Compressed sensing - Signal detection - Signal reconstruction - Digital storage
Uncontrolled terms: Compressive sensing - Empirical Mode Decomposition - Intrinsic Mode functions - Large data volumes - Random measurement - Sparse representation - Transient electromagnetics - Underground transients
Classification code: 512.1.1 Oil Fields - 716.1 Information Theory and Signal Processing - 722.1 Data Storage, Equipment and Techniques - 921.1 Algebra
DOI: 10.1109/ICMSP53480.2021.9513399
Funding Details: Number: 2020KJXX-018, Acronym: -, Sponsor: -; Number: 41874158,51974250, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China;
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Data Provider: Engineering Village
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235. A Data-Driven Optimization Model of Important Multidimensional Factors Affecting College Students' Cognitive Engagement in Ideological and Political Theory Course (*Open Access*)

Accession number: 20215011315312
Authors: Wang, Liangliang (1, 2)
Author affiliation: (1) School of Marxism, Northwestern Polytechnical University, Shaanxi, Xi'an; 710072, China; (2) School of Marxism, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China
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Publication year: 2021
Article number: 2257415
Language: English
ISSN: 10589244
CODEN: SCIPEV
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: The optimization of important multidimensional factors is conducive to cognitive engagement, which is a crucial dimension of student engagement and plays a significant role in college students' learning of the Ideological and Political Theory Course. However, because there are many influencing factors associated with cognitive engagement, the influence mechanism and analysis strategy of this kind of model are relatively complex. In order to solve this research gap, this paper establishes an optimization model affecting Chinese college students' cognitive engagement in IPTC on the basis of sample collection and investigation. In this process, 4,700 questionnaires were distributed to 47 colleges and universities across the country, and copies were effectively recovered (N = 3992); the effective recovery rate was 84.94%. Cronbach's alpha of 0.759 indicates that the scale has high reliability and Pearson's correlation coefficient P $\leq$ 0.001 shows that the scale has good validity. The KMO value of 0.703 in the Bartlett sphere test also shows that the scale is suitable for factor analysis. Firstly, according to the method of factor analysis, there are six important factor dimensions affecting college students' cognitive engagement in the IPTC, namely, attention and motivation factor dimension, behavior and value attainment factor dimension, interest and practicality factor dimension, personality and will factor dimension, evaluation and time factor dimension, and knowledge and strategy factor dimension. Then, through descriptive analysis, it is found that personality and will factor dimension (M = 6.5837) plays a relatively major role while knowledge motivation dimension (M = 6.3505) has a weak impact on cognitive engagement. Finally, from linear regression analysis, there is a significant positive correlation between cognitive engagement and other variables. In addition, undergraduates are slightly lacking motivation in the learning of the course, and vigorously strengthening college students' cognitive engagement is still necessary, so as to effectively enhance the effectiveness of the IPTC in the future. © 2021 Liangliang Wang.
Number of references: 40
Main heading: Factor analysis
Controlled terms: Regression analysis - Students - Correlation methods - Multivariant analysis - Surveys - Motivation - Optimization
Uncontrolled terms: Analysis strategies - College students - Data-driven optimization - Influence analysis - Influence mechanism - Optimisations - Optimization models - Political theory course - Student engagement - Student learning
Classification code: 912.4 Personnel - 921.5 Optimization Techniques - 922 Statistical Methods - 922.2 Mathematical Statistics
Numerical data indexing: Percentage 8.494E+01%, Size 1.78562E-02m
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Compendex references: YES
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236. Study on the vibration response mechanism of gear root crack and spalling

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Authors: Wan, Zhiguo (1); He, Wangpeng (2); Liao, Nannan (2); Dou, Yihua (1); Guo, Baolong (2)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Aerospace Science & Technology, Xidian University, Xi'an; 710071, China
Corresponding author: He, Wangpeng(hewp@xidian.edu.cn)
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Language: Chinese
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CODEN: XDKXEP
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Root crack and spalling are common gear faults in a gear transmission system. Due to the lack of research on the fault mechanism, these two fault types cannot be accurately identified by the current gear fault diagnosis methods. Based on the energy method, an analytical model is established to analyze and compare the different mechanisms of the influence of the two faults on the time-varying meshing stiffness. A dynamic model of the gear system is established to analyze the vibration response mechanism of the root crack and spalling fault. By comparison, it is found that although the root crack and spalling fault will make the system produce the periodic vibration and impact response, the number and law of impact response produced by the two faults in one meshing cycle are quite different. The research results reveal the differences in vibration response mechanism between root crack and tooth spalling faults, which provides a theoretical basis for the accurate diagnosis of these two kinds of faults. © 2021, The Editorial Board of Journal of Xidian University. All right reserved.
Number of references: 14
Main heading: Dynamic models
Controlled terms: Fault detection - Gears - Spalling - Stiffness - Vibration analysis
Uncontrolled terms: Dynamics models - Fault mechanism - Gear faults - Gear transmission system - Impact response - Response mechanisms - Root crack - Time varying meshing stiffness - Vibration response - Vibration response mechanism
Classification code: 601.2 Machine Components - 921 Mathematics - 951 Materials Science
DOI: 10.19665/j.issn1001-2400.2021.06.016
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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237. Design of phase angle measurement system for single-phase line based on MATLAB

Accession number: 20213510848007
Authors: Qin, Hongwei (1); Dang, Ruirong (1)
Author affiliation: (1) Xi'An Shiyou University, Shaanxi Provincial Key Laboratory of Oil and Gas Well Measurement and Control Technology, Shaanxi, Xi'an; 710065, China
Corresponding author: Qin, Hongwei(qinhw516@163.com)
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Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to improve the power quality of the power transmission system, engineers must measure the phase angle of the transmission line to evaluate the power quality. Therefore, this article measures the phase angle by measuring the real-time voltage signal and current signal of the single-phase transmission line. This design is considered from the two aspects of hardware and software as well as the upper computer and the lower computer cooperate to test. The whole system uses ARM as the core to measure and process the parameters of the transmission line, which combined with the characteristics of ARM for signal acquisition, analog-to-digital conversion, data processing. The lower computer uploads it to the upper computer MATLAB for programming calculation through serial communication, and it uses the cross-correlation function method to measure the phase angle between voltage

and current to meet the design requirements. The above design has been proved through experiments that it can be applied to engineering practice. The cross-correlation function algorithm in MATLAB closely fits the measurement of the phase angle of the transmission line. It proposes a new method for the measurement of the phase angle and lays a solid foundation for the future phase angle optimization. © 2021 IEEE.
Number of references: 11
Main heading: MATLAB
Controlled terms: Computer hardware - Power quality - Data handling - Electric power transmission networks - Signal processing - Electric lines - Analog to digital conversion - Software testing - Transmissions - Electric power transmission
Uncontrolled terms: Cross-correlation function - Engineering practices - Hardware and software - Phase angle measurement - Power transmission systems - Serial communications - Signal acquisitions - Single phase transmission lines
Classification code: 602.2 Mechanical Transmissions - 706.1.1 Electric Power Transmission - 706.1.2 Electric Power Distribution - 706.2 Electric Power Lines and Equipment - 716.1 Information Theory and Signal Processing - 722 Computer Systems and Equipment - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 921 Mathematics
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Funding text: Acknowledgments Thanks to the teacher for the past guidance and the support of the National Natural Science Foundation of China. The project name is time-domain electromagnetic method multi-component reservoir online monitoring (41874158).
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Data Provider: Engineering Village
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238. Effects of stratigraphic division on stability analysis of high loess slopes

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Title of translation:
Authors: Lin, Xiao-Yan (1, 2); Yang, Ze (3); Li, Ping (4); Yang, Yong-Hui (5); Li, Tong-Lu (4)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an Shiyou University, Xi'an; 710065, China; (3) Shaanxi Railway Instutute, Weinan; 714000, China; (4) School of Geological Engineering and Geomatics, Chang'an University, Xi'an; 710054, China; (5) China Electronic Research Institute of Engineering Investigations and Design, Xi'an; 710054, China
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Publication year: 2021
Pages: 76-80
Language: Chinese
ISSN: 10004548
CODEN: YGXUEB
Document type: Journal article (JA)
Publisher: Chinese Society of Civil Engineering
Abstract: Taking the high loess slope with a slope of 45° and a slope height of 100 m in Linfen-Jixian Expressway area of Shanxi Province as an example, different stratigraphic stratification methods are studied. The models for four stratification methods are established by using the SLOPE/W software, and the limit equilibrium method (Morgenstern-Price method) is used to solve the stability coefficients of different models. The influences of different stratification methods on the stability of the high loess slope are explored to obtain the optimal stratigraphic stratification methods. The analysis results show that the stability coefficients calculated by different stratigraphic stratification methods are different. With the increase of the number of stratifications, the larger the stability coefficient is, the better the slope stability is. In addition, through comprehensive comparative analysis, the method for dividing the loess strata according to the geological era can meet the research needs of construction engineering field. Moreover, less workload can improve efficiency and save cost, which is more significant for the calculation and analysis of the stability of high loess slopes. © 2021, Editorial Office of Chinese Journal of Geotechnical Engineering. All right reserved.
Number of references: 11
Main heading: Slope stability
Controlled terms: Geotechnical engineering - Sediments - Stratigraphy

Uncontrolled terms: Comparative analysis - Construction engineering - Limit equilibrium methods - Loess slopes - Morgenstern-Price method - Research needs - Stability analysis - Stability coefficient
Classification code: 406.2 Roads and Streets - 409 Civil Engineering, General - 481 Geology and Geophysics - 481.1 Geology - 483 Soil Mechanics and Foundations
Numerical data indexing: Size 1.00e+02m
DOI: 10.11779/CJGE2021S1014
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Database: Compendex
Data Provider: Engineering Village
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239. A fiber Bragg grating accelerometer based on corrugated diaphragm

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Authors: Li, Xiaorui (1); Yu, Dakuan (1); Fan, Xiaoyang (1); Ding, Wei (1); Cheng, Yiwei (1); Liu, Qinpeng (1); Qiao, Xueguang (2)
Author affiliation: (1) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, School of Science, Xian Shiyou University, Xian; 710065, China; (2) School of Physics, Northwest University, Xian; 710069, China
Corresponding author: Yu, Dakuan(yudakuan04@163.com)
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Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 11761
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Issue title: Fourth International Conference on Photonics and Optical Engineering
Issue date: 2021
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Article number: 117611H
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CODEN: PSISDG
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Document type: Conference article (CA)
Conference name: 4th International Conference on Photonics and Optical Engineering
Conference date: October 15, 2020 - October 16, 2020
Conference location: Xi'an, China
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Sponsor: Chinese Optical Society; High-speed Photography and Photonics Committee of Chinese Optical Society; Optics and Photonics Society of Singapore; Shaanxi Optical Society; The Society of Photo-Optical Instrumentation Engineers (SPIE)
Publisher: SPIE
Abstract: A high frequency fiber Bragg grating (FBG) accelerometer based on corrugated diaphragm has been proposed. The mechanical model is demonstrated. The accelerometer contains four parts, corrugated diaphragm, a FBG, two mass blocks, shell. The corrugated diaphragm is fixed on the shell. The upper and lower parts of the diaphragm center are symmetrically fixed by two mass blocks. The FBG is glued between the bottom of shell and mass blocks through a microhole. The amplitude-frequency and sensitivity of the accelerometer are theoretically analyzed and experimental measured. Experimental results show that the resonant frequency of the accelerometer is 490Hz, the sensor has a broad flat frequency range from 20 Hz to 350 Hz, the sensitivity of the accelerometer is about 50.3 pm/G with a linearity of 0.9997. The cross-sensitivity of the accelerometer is tested and the cross-Axis sensitivity is about 8% of the main-Axis. The accelerometer has a wide frequency and high sensitivity, which is promising in cross well micro-seismic exploration. © COPYRIGHT SPIE. Downloading of the abstract is permitted for personal use only.
Number of references: 12
Main heading: Fiber Bragg gratings
Controlled terms: Accelerometers - Seismology - Diaphragms - Natural frequencies
Uncontrolled terms: Amplitude frequency - Corrugated diaphragm - Cross sensitivity - Cross-axis sensitivity - Fiber bragg grating accelerometer - Frequency ranges - High frequency HF - Mechanical model
Classification code: 484.1 Earthquake Measurements and Analysis - 601.2 Machine Components - 943.1 Mechanical Instruments
Numerical data indexing: Frequency 2.00e+01Hz to 3.50e+02Hz, Frequency 4.90e+02Hz, Percentage 8.00e+00%
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Funding text: This work was supported by the National Natural Science Foundation of China (Nos. 61927812, 61735014), Innovation and Entrepreneurship Training Project for College Students of Shaanxi Province, China (No. s201910705001), Scientific Research Program Funded by Shaanxi Provincial Education Department of China (No.18JS093).
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Database: Compendex
Data Provider: Engineering Village
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240. A real-time correction method for baseline wander of transient electromagnetic logging signals

Accession number: 20213510848027
Authors: Dang, Bo (1); Zhang, Chenlu (1); Zhang, Xiang (1); Cheng, Lanqing (1)
Author affiliation: (1) Xi'An Shiyou University, Ministry of Education, Key Laboratory of Photoelectric Logging and Detecting of Oil and Gas, Shaanxi, Xi'an, China
Corresponding author: Dang, Bo(bodang521@126.com)
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Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The empirical mode decomposition method can eliminate the baseline wander caused by the changes in the downhole environment, but it is difficult to achieve real-time segmentation processing due to the influence of the end effect. Aiming at this problem, this paper proposed a real-time correction method for baseline wander of transient electromagnetic logging signals based on mirror continuation method. In this method, by locating the position of the coupling in the original signal, and taking the middle position of the two couplings as the end point, the logging signal is extracted and corrected in real time and in sections. First, the original signal at the endpoint is extracted and its mirror image is extended. Then the extended signal is decomposed by empirical mode and the high-order intrinsic mode function is removed. On this basis, the corresponding continuation point is truncated according to the depth of the original signal endpoint and then the signal is reconstructed. Finally, the next segment of the original signal is reselected to eliminate the baseline wander and the corrected signals are successively spliced to finally realize the real-time segmented correction of the log signal baseline wander. The processing and analysis of field measured data show that the method studied in this paper can effectively solve the problem of transient electromagnetic logging signal baseline wander caused by downhole temperature, and has the advantages of real-time, high efficiency and accuracy.
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Number of references: 10
Main heading: Empirical mode decomposition
Controlled terms: Electromagnetic wave attenuation - Electromagnetic logging - Mirrors - Transient analysis
Uncontrolled terms: Continuation method - Empirical mode decomposition method - Field-measured data - High-efficiency - Intrinsic Mode functions - Real-time corrections - Real-time segmentation - Transient electromagnetics

Classification code: 512.1.2 Petroleum Deposits : Development Operations - 701 Electricity and Magnetism - 711 Electromagnetic Waves - 716.1 Information Theory and Signal Processing - 741.3 Optical Devices and Systems
DOI: 10.1109/ICMSP53480.2021.9513350
Funding Details: Number: 2020KJXX-018, Acronym: -, Sponsor: -; Number: 41874158,51974250, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China;
Funding text: ACKNOWLEDGMENT This work was supported by the National Natural Science Foundation of China under Grant 51974250 and Grant 41874158 and the Youth Science and Technology Nova Project in Shaanxi Province, China under Grant 2020KJXX-018.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

241. In-Fiber Michelson Interferometer in Photonic Crystal Fiber for Humidity Measurement

Accession number: 20205209691779
Authors: Shao, Min (1); Sun, Haonan (1); Liang, Junjun (1); Han, Liang (1); Feng, Dequan (1)
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Corresponding author: Shao, Min(shaomin@xsyu.edu.cn)
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Volume: 21
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Issue date: January 15, 2021
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Pages: 1561-1567
Article number: 9178339
Language: English
ISSN: 1530437X
E-ISSN: 15581748
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: A humidity sensor based on photonic crystal fiber (PCF) is experimentally demonstrated, which was fabricated by sandwiching a taper between PCF and a standard single mode fiber (SMF). The taper and collapsed region in PCF excite high-order modes and couple them with core mode to form a Michelson interferometer (MI). Experiment results show that the reflection interference intensity linearly changes with humidity and the sensitivity is -0.166 dB/%RH in the range of 30-90 %RH, the sensor displayed a low temperature cross-sensitivity of 0.09 %RH/°C in the temperature range of 20-100 °C. In addition, a rise/recovery time of 400/200 ms was achieved respectively for human breathing test. The easy fabrication, high sensitivity and fast response indicate the sensor has broad practical prospects. © 2001-2012 IEEE.
Number of references: 19
Main heading: Humidity sensors
Controlled terms: Crystal whiskers - Temperature - Photonic crystal fibers - Single mode fibers - Optical fiber fabrication - Nonlinear optics - Michelson interferometers
Uncontrolled terms: Easy fabrication - High order mode - High sensitivity - Humidity measurements - Interference intensity - Low temperatures - Standard single mode fibers - Temperature range
Classification code: 443.2 Meteorological Instrumentation - 641.1 Thermodynamics - 741.1.1 Nonlinear Optics - 741.1.2 Fiber Optics - 933.1.1 Crystal Lattice - 941.3 Optical Instruments - 951 Materials Science
Numerical data indexing: Temperature 2.93e+02K to 3.73e+02K
DOI: 10.1109/JSEN.2020.3019717
Funding Details: Number: 61805197, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: Manuscript received July 7, 2020; accepted August 18, 2020. Date of publication August 26, 2020; date of current version December 16, 2020. This work was supported in part by the National Natural Science Foundation of China under Grant 61805197. The associate editor coordinating the review of this article and approving it for publication was Prof. Marco Petrovich. (Corresponding author: Min Shao.) The authors are with the Key Laboratory on Photoelectric Oil-Gas Logging and Detecting, Ministry of Education, School of Science, Xi'an Shiyou University, Xi'an 710065, China (e-mail: shaomin@xsyu.edu.cn). Digital Object Identifier 10.1109/JSEN.2020.3019717
Compendex references: YES
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242. All-optical tunable slow-light based on an analogue of electromagnetically induced transparency in a hybrid metamaterial (*Open Access*)

Accession number: 20214110995456
Authors: Ma, Chengju (1); Zhang, Yuebin (1); Zhang, Yao (1); Bao, Shiqian (1); Jin, Jiasheng (1); Li, Mi (1); Li, Dongming (1); Liu, Yinggang (1); Xu, Yiping (2)
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Corresponding author: Ma, Chengju(chengjuma@xsyu.edu.cn)
Source title: Nanoscale Advances
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Volume: 3
Issue: 19
Issue date: October 7, 2021
Publication year: 2021
Pages: 5636-5641
Language: English
E-ISSN: 25160230
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: We demonstrate and analyze the use of metamaterials featuring an analogue of electromagnetically induced transparency (EIT) in slow light technology. For most metamaterials, EIT-like effects suffer from intrinsic ohmic loss, and the metamaterial-based slow-light effect can only be tuned passively, which limits their application in slow light devices. We propose a hybrid metamaterial with a unit cell composed of a ring resonator formed from photoactive silicon (Si) and a rectangular bar formed from metallic silver (Ag). Based on an analogue of EIT in the designed hybrid metamaterial, we theoretically demonstrate an all-optical tunable slow-light effect in the telecommunication window. We successfully demonstrate the possibility of designing novel all-optical tunable chip-scale slow-light devices that could be used in optical buffering. © The Royal Society of Chemistry.
Number of references: 28
Main heading: Slow light
Controlled terms: Quantum optics - Transparency - Metamaterials
Uncontrolled terms: A-RINGS - All optical - Electromagnetically-induced transparency - Light effects - Ohmic loss - Rectangular bar - Ring resonator - Slow-light devices - Tunables - Unit cells
Classification code: 741.1 Light/Optics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science
DOI: 10.1039/d1na00232e
Funding Details: Number: -, Acronym: CSC, Sponsor: China Scholarship Council; Number: 15JK1578, Acronym: -, Sponsor: Education Department of Shaanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village
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243. Characterization and quantitative evaluation of hydraulic fracture network based on acoustic emission monitoring

Accession number: 20220411498402
Authors: Wu, Shan (1); Ge, Hongkui (2); Wang, Xiaoqiong (2); Li, Tiantai (3); Gao, Ke (4)
Author affiliation: (1) Southern University of Science and Technology, Shenzhen, China; (2) China University of Petroleum (Beijing), Beijing, China; (3) Xi'an Shiyou University, Xi'an, China; (4) Southern University of Science and Technology, Shenzhen, China
Source title: 55th U.S. Rock Mechanics / Geomechanics Symposium 2021
Abbreviated source title: U.S. Rock Mech. / Geomech. Symp.
Volume: 4
Part number: 4 of 5
Issue title: 55th U.S. Rock Mechanics / Geomechanics Symposium 2021

Issue date: 2021
Publication year: 2021
Report number: ARMA 21-1845
Language: English
ISBN-13: 9781713839125
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Conference name: 55th U.S. Rock Mechanics / Geomechanics Symposium 2021
Conference date: June 18, 2021 - June 25, 2021
Conference location: Houston, Virtual, TX, United states
Conference code: 175961
Publisher: American Rock Mechanics Association (ARMA)
Abstract: Hydraulic fracturing technique is commonly used to enhance the production of tight reservoirs. Generally, the effect of hydraulic fracturing is appraised through true triaxial hydraulic fracturing experiments in laboratory, in which acoustic emission (AE) is often used to monitor the fracturing processes. At present, the number of AE events and the spatial distribution of AE locations are the two main factors considered in the evaluation of fracturing effect. A large number of AE events and a wide spatial distribution of AE locations often indicate a better fracturing effect. However, this regularly employed evaluation approach ignores two important factors, i.e., the connectivity of fractures formed by fracturing, and the property of tensile and shear fractures formed by fracturing. The former directly affects the generation of effective path for production in tight reservoirs, and the latter affects the production by alternating the permeability of fractures. In this paper, we consider the influence of these two factors on fracturing effect by establishing a connected fractures model based on AE data. We compare the results from seven triaxial hydraulic fracturing experiments and find that it is more effective to evaluate the hydraulic fracturing effect by comprehensively considering the connectivity between AE location and the tension-shear property of AE. Copyright © 2021 ARMA, American Rock Mechanics Association.
Number of references: 29
Main heading: Hydraulic fracturing
Controlled terms: Acoustic emission testing - Spatial distribution - Fracture - Shear flow - Rock mechanics - Location - Petroleum reservoir engineering
Uncontrolled terms: Acoustic emission locations - Acoustic emission monitoring - Acoustic-emissions - Fracture network - Fracturing process - Fracturing techniques - Network-based - Quantitative evaluation - Tight reservoir - True triaxial
Classification code: 405.3 Surveying - 483.1 Soils and Soil Mechanics - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 751.2 Acoustic Properties of Materials - 902.1 Engineering Graphics - 921 Mathematics - 951 Materials Science
Funding Details: Number: 51774236, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: ZLZX2020-01-07,ZLZX2020-01-08, Acronym: CUP, Sponsor: China University of Petroleum, Beijing; Number: -, Acronym: КННК, Sponsor: China National Petroleum Corporation;
Funding text: The authors express thanks for financial support from the subprojects of the Strategic Cooperation Technology Projects of CNPC and CUPB (ZLZX2020-01-08 and ZLZX2020-01-07), and the Natural Science Foundation of China (No. 51774236).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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244. Design of Programmable Gain Amplifier Module in Dynamic Liquid Level Tester (*Open Access*)

Accession number: 20212110392489
Authors: Zhang, Jiatian (1); Qin, Hongwei (1); Yan, Zhengguo (1)
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Corresponding author: Qin, Hongwei(2990110037@qq.com)
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Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020

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Article number: 012027
Language: English
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: Oil and gas wells need to perform dynamic liquid level detection during the development to prevent inaccurate detection during drilling and damage the oil and gas field. The Program Controlled Gain Amplifier (PGA) module designed in this paper is used in the dynamic liquid level test instrument. Using STM32F4O7ZGT6 as a microcontroller (MCU), the MCU, a multi-stage variable gain amplifier and a peak detection circuit form a closed loop control, forming an automatic gain control (AGC) circuit. First, the signal output by the peak detection circuit is collected by AD, and then the entire module is in a dynamic balance state through DA feedback. This AGC system can accurately control the gain and output signal. Finally, the ratio-average filtering algorithm is used to test the experimental data. Experimental results show that the module can achieve gain control of-20#60dB in the frequency range of 1kHz#20MHz; the relative error of the output voltage is within 3%. This module achieves the performance indicators of broadband, high precision and high gain. Compared with the traditional module, its advantage is that it takes into account and optimizes the three performance indicators at the same time, and has better stability. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Variable gain amplifiers
Controlled terms: Benchmarking - Damage detection - Gain control - Voltage regulators - Natural gas fields - Software testing - Gas industry
Uncontrolled terms: Automatic gain control circuit - Average filtering - Closed-loop control - Controlled gain amplifiers - Dynamic liquid levels - Oil and gas fields - Performance indicators - Programmable gain amplifier
Classification code: 512.2.1 Natural Gas Fields - 522 Gas Fuels - 713.1 Amplifiers - 723.5 Computer Applications - 731.3 Specific Variables Control - 732.1 Control Equipment
Numerical data indexing: Percentage 3.00e+00%
DOI: 10.1088/1742-6596/1894/1/012027
Funding Details: Number: 15JS097, Acronym: -, Sponsor: -;
Funding text: Project funding: Shaanxi Provincial Department of Education Key Laboratory Scientific Research Project (15JS097)
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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245. Design of intelligent real-time safety supervision system for pension institutions based on LBS (*Open Access*)

Accession number: 20214711190656
Authors: Song, Caili (1); Kateb, Faris (2); Aouad, Marwan (3)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University, Shaanxi; 710065, China; (2) Canadian University, Dubai, United Arab Emirates; (3) Applied Science University, Bahrain
Corresponding author: Song, Caili(songcaili@xsyu.edu.cn)
Source title: Applied Mathematics and Nonlinear Sciences
Abbreviated source title: Appl. Math. Nonlinear Sci.
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Publication year: 2021
Pages: 323-330
Language: English

E-ISSN: 24448656
Document type: Journal article (JA)
Publisher: Sciendo
Abstract: With the gradual ageing of China's population and the single-child family system becoming the backbone of society, the traditional pension way of relying on children at home not only does not guarantee the quality of life of the elderly, but also brings great pressure to the work and life of young people. The way of relying on pension institutions to provide for the aged is becoming gradually accepted by society. In elderly care institutions, safety supervision systems provide an important link to protect the safety of the elderly, thereby ensuring accurate analysis and supervision of the elderly persons' activity routes and activity rules, and thus allowing an early warning to be given in a dangerous situation. The system realises the real-time positioning and monitoring of the elderly activity track, and can give early warning and timely rescue to the elderly who enter into any dangerous area. The system includes a server monitoring program and mobile APP; ASP.NET Technology to develop the monitoring program; SQL Server 2012 for data storage; and model view controller (MVC) architecture for the APP to improve the efficiency of program development. The supervision program comprises the functions of personnel information management, fence management, positioning service, activity track record, danger warning and rapid rescue. The APP deploys the location-based service (LBS) technology of Android, uses Baidu map API to obtain location information and draw activity track, and stores the information in the mobile phone SQLite database. The APP is installed on mobile phones, bracelets and other devices carried by the elderly and staff, which can record the current position of the person in real-time and simultaneously transmit it to the computer. When the elderly enter into a dangerous area, the system can quickly select the nearest staff and inform them for rescue, so as to ensure the safety of the elderly. After simulation test, the system has now reached the preset function. © 2021 Caili Song et al., published by Sciendo.
Number of references: 12
Main heading: Application programs
Controlled terms: Information management - Human resource management - Cellular telephones - Digital storage - Telecommunication services - Location based services
Uncontrolled terms: Baidu map - Dangerous area - Early warning - Location-based services - Monitoring programmes - Nursing homes - Quality of life - Real- time - Safety supervision system - Young peoples
Classification code: 716 Telecommunication; Radar, Radio and Television - 718.1 Telephone Systems and Equipment - 722.1 Data Storage, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 912.2 Management - 912.4 Personnel
DOI: 10.2478/amns.2021.2.00047
Funding Details: Number: 2020KJRC0101, Acronym: -, Sponsor: -; Number: 2019JQ-056, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
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246. Effects of Friction Coefficient on Structure and Sealed Integrity of Expandable Casing Joint with Metal-to-metal Seal

Accession number: 20211910343224
Authors: Zhang, Jianbing (1); Wang, Haobo (1); Liu, Hua (2); Luo, Chu (1); Cao, Yinping (1); Wang, Qian (1)
Author affiliation: (1) Xi'an Shiyou University, Mechanical Engineering College, Xi'an; 710065, China; (2) Gas Production Plant 3 of PetroChina Changqing Oilfield Company, Xi'an; 710018, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Publication year: 2021
Pages: 1344-1348
Article number: 9408891
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021

Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: During the expansion process, the structure and sealed integrity of a new type expandable casing joint with metal sealing were explored by the finite element explicit dynamic analysis method, the nonlinear analysis is used in the expansion process of metal sealing joint of expansion casing under different friction coefficients between expansion cone and inner wall of expansion casing, while the key technical parameters such as effective stress, residual stress and contact force on the sealing surface of the expandable casing joint were obtained. When the expansion process is over, the V on Mises peak stress and residual stress increase with the rise of the friction coefficient. In order to maintain the structural integrity of the joint, the friction coefficient should be controlled below 0.12. Stress is focused on the thread teeth in the expansion process, and the residual peak stress is concentrated at the root of internal thread after expansion. Increasing the friction coefficient moderately is beneficial to increase the contact force between sealing surfaces after expansion, and thus to improve the sealing performance of the joint. Considering the structure and sealed integrity of the joint, the friction coefficient should be controlled at about 0.1. The results of the paper research had reference value for the design of expandable casing joint with metal sealing structure. © 2021 IEEE.
Number of references: 11
Main heading: Metals
Controlled terms: Nonlinear analysis - Seals - Friction - Residual stresses - Finite element method
Uncontrolled terms: Effective stress - Expansion cones - Expansion process - Explicit dynamics - Friction coefficients - Internal threads - Reference values - Sealing performance
Classification code: 619.1.1 Pipe Accessories - 921.6 Numerical Methods
DOI: 10.1109/ICSP51882.2021.9408891
Funding Details: Number: 51905426,51974251, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019D-5007-0305, Acronym: -, Sponsor: PetroChina Innovation Foundation; Number: 2020KW-015, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: The authors are grateful for the financial support from the National Natural Science Foundation of China (Nos. 51974251 and 51905426), Key Research and Development Program of Shaanxi (No. 2020KW-015) and Petro China Innovation Foundation(2019D-5007-0305).
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247. Effect of shape memory alloys on the mechanical properties of metallic glasses: A molecular dynamics study

Accession number: 20204309377220
Authors: Li, W.W. (1); Song, H.Y. (1); Dai, J.L. (1, 2); Wang, J.Y. (1, 2); An, M.R. (1); Li, Y.L. (2)
Author affiliation: (1) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Aeronautics, Northwestern Polytechnical University, Xi'an; 710072, China
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Source title: Computational Materials Science
Abbreviated source title: Comput Mater Sci
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Publication year: 2021
Article number: 110088
Language: English
ISSN: 09270256
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The strength-plasticity trade-off of metallic glass (MG) has not still been effectively overcome. The introduction of shape memory alloy (SMA) is an effective way to improve the mechanical properties of MG. Here, the deformation behavior of amorphous/SMA Cu64Zr36/B2-CuZr nanomultilayers (ASNMs) under tension loading is investigated by molecular dynamics (MD) simulation method. The results show that the peak stresses and flow stress of the ASNMs are greater than those of the monolithic MG regardless of SMA volume fraction. The martensitic transformation (MT) in the SMA phase limits the propagation of shear bands (SBs), avoids a runaway instability, and simultaneously induces plastic strain strengthening. The results also indicate that the plastic deformation mode

of ASNMs changes from the interaction of multiple SBs dominated to finally brittle fracture caused by nano-pores aggregation with the increase of SMA volume fraction. This means that the plasticity and strength of ASNMs can be significantly improved by adjusting the volume fraction of SMA. The fruits stem from this paper may provide a valuable guidance and theory route for the design of high-performance MGs. © 2020 Elsevier B.V.
Number of references: 54
Main heading: Molecular dynamics
Controlled terms: Plastic deformation - Glass - Economic and social effects - Martensitic transformations - Metallic glass - Plasticity - Volume fraction
Uncontrolled terms: Deformation behavior - Molecular dynamics simulations - Nanomultilayers - Peak stress - Shape memory alloys(SMA) - Tension loading - Trade off
Classification code: 531 Metallurgy and Metallography - 531.2 Metallography - 641.1 Thermodynamics - 801.4 Physical Chemistry - 812.3 Glass - 951 Materials Science - 971 Social Sciences
DOI: 10.1016/j.commatsci.2020.110088
Funding Details: Number: YCS18211007, Acronym: -, Sponsor: -; Number: 2019JQ-827, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work is supported by the National Natural Science Foundation of China (No. 11572259), Natural Science Foundation of Shaanxi Province (No. 2019JQ-827), The Youth Innovation Team of Shaanxi Universities, and Program for Graduate Innovation Fund of Xian Shiyou University (No. YCS18211007).
Compendex references: YES
Database: Compendex
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248. Projection-Based QLP Algorithm for Efficiently Computing Low-Rank Approximation of Matrices (*Open Access*)

Accession number: 20211310144435
Authors: Kaloorazi, Maboud F. (1, 2); Chen, Jie (1)
Author affiliation: (1) School of Marine Science and Technology, Northwestern Polytechnical University, Xi'an, China; (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710000, China
Corresponding author: Chen, Jie(dr.jie.chen@ieee.org)
Source title: IEEE Transactions on Signal Processing
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Language: English
ISSN: 1053587X
E-ISSN: 19410476
CODEN: ITPRED
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Matrices with low numerical rank are omnipresent in many signal processing and data analysis applications. The pivoted QLP (p-QLP) algorithm constructs a highly accurate approximation to an input low-rank matrix. However, it is computationally prohibitive for large matrices. In this paper, we introduce a new algorithm termed Projection-based Partial QLP (PbP-QLP) that efficiently approximates the p-QLP with high accuracy. Fundamental in our work is the exploitation of randomization and in contrast to the p-QLP, PbP-QLP does not use the pivoting strategy. As such, PbP-QLP can harness modern computer architectures, even better than competing randomized algorithms. The efficiency and effectiveness of our proposed PbP-QLP algorithm are investigated through various classes of synthetic and real-world data matrices. © 1991-2012 IEEE.
Number of references: 58
Main heading: Singular value decomposition
Controlled terms: Approximation theory - Factorization - Data handling - Signal processing - Computer architecture - Approximation algorithms
Uncontrolled terms: Data matrices - Highly accurate - Low rank approximations - Low-rank matrices - Randomized Algorithms - Real-world

Classification code: 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 921 Mathematics - 921.6 Numerical Methods
DOI: 10.1109/TSP.2021.3066258
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Funding text: Manuscript received December 17, 2019; revised September 3, 2020 and January 12, 2021; accepted March 7, 2021. Date of publication March 17, 2021; date of current version May 28, 2021. The associate editor coordinating the review of this manuscript and approving it for publication was Prof. Yue M. Lu. The work of Jie Chen was supported in part by the National Key Research and Development Program of China under Grants 2018AAA0102200 and 111 project B18041. (Corresponding author: Jie Chen.) Maboud F. Kaloorazi is with the School of Marine Science and Technology, Northwestern Polytechnical University, Xi'an, China, and also with School of Electronic Engineering, Xi'an Shiyou University, Xi'an 710000, China (e-mail: kaloorazi@xsyu.edu.cn).
Compendex references: YES
Open Access type(s): All Open Access, Green
Database: Compendex
Data Provider: Engineering Village
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249. Study on series voltage equalizing method of IGBT in high voltage circuits

Accession number: 20213510848101
Authors: Yang, Jiahui (1); Cao, Ke (2); Li, Hong (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Automation Instrument and Process Control Laboratory, Xi an, China; (2) Shannxi Gaoke Power Electronics Ltd, Xi an, China
Corresponding author: Yang, Jiahui(547724640@qq.com)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Article number: 9513374
Language: English
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In this paper, a gate $RC-\mathrm{D}$ voltage equalizer circuit is studied. The purpose of this circuit is to solve the problem that the emitter voltage distribution of each component set is uneven when IGBT runs in series. The working principle of gate $RC-\mathrm{D}$ voltage equalizer is described, and the functions of all components in the voltage equalizer are analyzed under different switching states of IGBT. Finally, a series voltage equalizer circuit model of IGBT is built on PSPICE platform for simulation. By comparing the simulation results of voltage equalizing circuit with or without voltage equalizing circuit, a good voltage equalizing effect is obtained after simulating voltage imbalance under 4000V DC voltage. It provides a guarantee condition for the stable operation of IGBT in series, thus verifying the feasibility of the scheme. © 2021 IEEE.
Number of references: 7
Main heading: Insulated gate bipolar transistors (IGBT)
Controlled terms: HVDC power transmission - SPICE - Simulation platform - Equalizers - Timing circuits
Uncontrolled terms: Circuit modeling - DC voltage - Emitter voltage - High voltage circuits - Series voltage - Stable operation - Voltage imbalance

Classification code: 706.1.1 Electric Power Transmission - 713 Electronic Circuits - 713.4 Pulse Circuits - 713.5 Electronic Circuits Other Than Amplifiers, Oscillators, Modulators, Limiters, Discriminators or Mixers - 714.2 Semiconductor Devices and Integrated Circuits - 723.5 Computer Applications
DOI: 10.1109/ICMSP53480.2021.9513374
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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250. A comprehensive overview of framework for developing sustainable energy internet: From things-based energy network to services-based management system

Accession number: 20213110711667
Authors: Wu, Ying (1, 2); Wu, Yanpeng (2); Guerrero, Josep M. (2); Vasquez, Juan C. (2)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Shaanxi Province; 710065, China; (2) Department of Energy Technology, Aalborg University, Aalborg East; 9220, Denmark
Corresponding author: Wu, Ying(yiw@energy.aau.dk)
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Language: English
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CODEN: RSERFH
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Energy Internet (EI) envisions a future energy system with sustainable concerns of efficiency, economy and environment by achieving flexibility of multi-energy-integrated physical space, digitalization of data-driven cyber space and interaction of customer-aware social space. To systemically understand how EI manages energy, data and information flows, a comprehensive investigation from multi-angle perspectives is presented in this paper. The core building blocks are categorized into three-layered framework: energy-oriented network, communication-oriented network and service-oriented management. Furthermore, this paper provides a multi-disciplinary portrait of today's EI in terms of architecture, technologies, standards, services and platforms. Finally, open issues, future trends and challenges for development of sustainable EI are discussed. © 2021
Number of references: 170
Main heading: Information management
Controlled terms: Energy management systems - Peer to peer networks - Sustainable development
Uncontrolled terms: Decentralisation - Digitalization - Electrification - Energy internet - Energy trading - Energy transitions - Microgrid - Multi-energy systems - P2P - Sustainable energy
Classification code: 706 Electric Transmission and Distribution - 722 Computer Systems and Equipment
DOI: 10.1016/j.rser.2021.111409
Funding Details: Number: 25920, Acronym: -, Sponsor: Villum Fonden; Number: -, Acronym: EC, Sponsor: European Commission; Number: 51707158,61802301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: AAU, Sponsor: Anhui Agriculture University;
Funding text: The variety of research work associated with security and privacy has been spread wide to find solutions from different perspectives. In Ref. [118], the security and privacy challenges and solutions are discussed from different layers of IoT architecture, which includes perception layer, transportation layer, application layer and cross-layer integrated security issues. There is no doubt that smart metering infrastructure (SMI) has played a significant role in establishing the digital link between consumers and suppliers. SMI is acting as the backbone to integrate the large number of heterogeneous devices coordinating through public communication networks for developing monitoring, controlling and managing services. Cyber-attack has become serious issues in EI metering networks. State-of-the-art research activities on SMI security and privacy are reviewed in Ref. [119], which provides a hierarchical threat taxonomy by categorizing it in three terms: 1) threats & solutions to system level security; 2) threats & solutions to services; 3) threats & solutions to privacy. From the perspective of energy consumption sectors, the surveys on cyber security and privacy issues are respectively presented in smart city [120], smart buildings [121], vehicular networks [122], and so on. European Commission has already started to take a series of measures to tackle cybersecurity problems in energy sectors caused by digital technologies and networks [117], such as legislative

framework establishment, research funds projection, policy and standards support.This work was supported by VILLUM FONDEN under the VILLUM Investigator Grant (no. 25920): Center for Research on Microgrids (CROM), AAU Talent Programme: The Energy Internet - Integrating IoT into the Smart Grid, National Natural Science Foundation of China under Grant 51707158 and 61802301.This work was supported by VILLUM FONDEN under the VILLUM Investigator Grant (no. 25920): Center for Research on Microgrids (CROM), AAU Talent Programme: The Energy Internet - Integrating IoT into the Smart Grid, National Natural Science Foundation of China under Grant 51707158 and 61802301 .
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

251. The Robust Ground Clutter Canceller Based on Inaccurate Prior Knowledge in Airborne Radar (*Open Access*)

Accession number: 20213910957052
Authors: Dang, Bo (1); Zhou, Yan (2)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Information Science and Technology, Northwest University, Xi'an; 710127, China
Corresponding author: Zhou, Yan(spainraul123@126.com)
Source title: Mathematical Problems in Engineering
Abbreviated source title: Math. Probl. Eng.
Volume: 2021
Issue date: 2021
Publication year: 2021
Article number: 6690674
Language: English
ISSN: 1024123X
E-ISSN: 15635147
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Two-dimensional pulse-to-pulse canceller (TDPC) of ground clutter can effectively suppress the clutter along the clutter trace, and therefore the moving target detectability of the following space-time adaptive processing (STAP) algorithm can be improved after TDPC as the clutter prefilter. However, TDPC may greatly impair the energy of moving target when inaccurate knowledge is exploited, which is detrimental to target detection. Aiming at this problem, a robust two-dimensional pulse-to-pulse canceller (RTDPC) of ground clutter is proposed. In order to enhance the TDPC's robustness with inaccurate radar system parameters, which are mainly the platform velocity and crab angle, the errors of estimated platform velocity and crab angle are taken as the prior knowledge and added into the design of the clutter filter coefficient matrix. By exploiting RTDPC as the clutter prefilter, the moving target detectability of the following nonadaptive detection algorithm or STAP algorithm can also be enhanced. The simulated and MCARM data are utilized to verify the clutter suppression performance of RTDPC with inaccurate platform velocity and crab angle. © 2021 Bo Dang and Yan Zhou.
Number of references: 37
Main heading: Space time adaptive processing
Controlled terms: Echo suppression - Clutter (information theory) - Radar clutter
Uncontrolled terms: Clutter canceller - Energy - Ground clutter - Moving targets - Prefilters - Prior-knowledge - Processing algorithms - Space-time adaptive processing - Target detectability - Two-dimensional
Classification code: 716.1 Information Theory and Signal Processing - 716.2 Radar Systems and Equipment
DOI: 10.1155/2021/6690674
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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252. Digitalization and decentralization driving transactive energy Internet: Key technologies and infrastructures

Accession number: 20204409416030
Authors: Wu, Ying (1, 2); Wu, Yanpeng (2); Guerrero, Josep M. (2); Vasquez, Juan C. (2)

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Source title: International Journal of Electrical Power and Energy Systems
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Volume: 126
Issue date: March 2021
Publication year: 2021
Article number: 106593
Language: English
ISSN: 01420615
CODEN: IEPSDC
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: With the increasing access of renewable energy resources and fast ubiquitous connection of everything, the traditional one-way power flow from centralized generation to end consumers will give way to bidirectional-way power flow with multidirectional energy network among central grids and distributed prosumers. To empower the prosumer-centric Energy Internet (EI) and enhance the integration of energy-aware services, digitalization and decentralization are the key enablers to achieve transactive EI. This article presents a systematic overview on how Internet of Things (IoT) drives the digitalization of transactive EI and how blockchain empowers the decentralization of transactive EI. A comprehensive discussion on the key infrastructures is provided for presenting how to implement digitalization and decentralization of transactive EI, including the last mile "Advanced metering infrastructure" (AMI), renewables integrator "smart inverter", energy flow adjuster "energy router", and coordinator "Microgrid". Challenges and future trends are discussed from an extensive point of view, including energy physical space, data cyber space and human social space. © 2020 Elsevier Ltd
Number of references: 93
Main heading: Internet of things
Controlled terms: Blockchain - Advanced metering infrastructures - Digital storage - Power management - Renewable energy resources - Electric load flow
Uncontrolled terms: Centralized generation - Energy internet - Energy networks - Energy routers - Future trends - Internet of Things (IOT) - Key technologies - Smart inverters
Classification code: 525.1 Energy Resources and Renewable Energy Issues - 525.3 Energy Utilization - 704.2 Electric Equipment - 706.1 Electric Power Systems - 722 Computer Systems and Equipment - 722.1 Data Storage, Equipment and Techniques - 722.3 Data Communication, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 723.3 Database Systems
DOI: 10.1016/j.ijepes.2020.106593
Funding Details: Number: 25920, Acronym: -, Sponsor: Villum Fonden; Number: -, Acronym: AAU, Sponsor: Anhui Agricultural University; Number: 51707158,61802301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by VILLUM FONDEN under the VILLUM Investigator Grant (no. 25920): Center for Research on Microgrids (CROM), AAU Talent Programme: The Energy Internet - Integrating IoT into the Smart Grid, National Natural Science Foundation of China under Grant 51707158 and 61802301.
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Database: Compendex
Data Provider: Engineering Village
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253. Dynamic imbibition and drainage laws of factures in tight reservoirs

Accession number: 20213510848329
Title of translation:
Authors: Huang, Xing (1, 2); Dou, Liangbin (1); Zuo, Xiongdi (1); Gao, Hui (1); Li, Tiantai (1, 2)
Author affiliation: (1) School of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Cooperative Innovation Center of Unconventional Oil and Gas Exploration and Development, Xi'an; 710065, China
Corresponding author: Gao, Hui(gh@xsyu.edu.cn)
Source title: Shiyou Xuebao/Acta Petrolei Sinica
Abbreviated source title: Shiyou Xuebao
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Publication year: 2021

Pages: 924-935
Language: Chinese
ISSN: 02532697
CODEN: SYHPD9
Document type: Journal article (JA)
Publisher: Science Press
Abstract: To clarify the dynamic imbibition characteristics of water flooding in fractured tight reservoirs and solve the problems of low water flooding recovery, this paper studies the characteristics of microscopic pore structure of Chang 6 oil layer of Yanchang Formation in the Jiyuan oilfield by means of high-pressure mercury injection, nuclear magnetic resonance T2 spectrum, scanning electron microscope and cast thin section analysis, establishes the classification and evaluation criteria for three types of reservoirs, and carries out dynamic imbibition experiments on representative cores based on NMR online scanning. This paper also simulates the dynamic imbibition process between the fracture and the matrix during water flooding, quantitatively characterizes the producing degree of crude oil in pores with different pore sizes at the microscopic scale, and evaluates the degree of influence of eight reservoir physical parameters on the dynamic imbibition efficiency. The experimental results show that the pore structure of the target reservoirs can be divided into three types. With the pore structure deterioration of reservoirs, the pore types gradually become simplified, and the reservoiring performance and percolation capacity continue to decrease, resulting in the continuous decline of dynamic imbibition efficiency. The dynamic imbibition process of type I and II reservoirs can be divided into three stages:(1)under the action of displacement, the recovery percent of macropores rises rapidly; (2)under the action of imbibition, the recovery percent of tiny pores rises slowly; (3)the stage of dynamic imbibition equilibrium. However, the type III reservoirs only experienced the first two stages in the experiment. With the pore structure deterioration of reservoirs, the producing proportion of tiny pores increases, and the imbibition effect is obvious. Although the contribution to the total core recovery increases, the total recovery rate is low. Permeability, movable crude oil saturation, pore radius, movable crude oil porosity, clay mineral content and wettability are the main factors affecting the dynamic imbibition efficiency, and their degree of influence on the imbibition efficiency successively gradually decreases. Sorting coefficient and porosity are the secondary factors that affect the dynamic imbibition efficiency, and their degree of impact on the imbibition efficiency is relatively small. © 2021, Editorial Office of ACTA PETROLEI SINICA. All right reserved.
Number of references: 28
Main heading: Pore structure
Controlled terms: Scanning electron microscopy - Deterioration - Nuclear magnetic resonance - Crude oil - Oil well flooding - Pore size - Reservoirs (water) - Solvents - Efficiency - Floods - Fracture - Recovery
Uncontrolled terms: Classification and evaluations - Different pore sizes - Dynamic imbibition - High pressure mercury - Imbibition efficiencies - Microscopic pore structures - Physical parameters - Yanchang Formation
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 803 Chemical Agents and Basic Industrial Chemicals - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.7623/syxb202107007
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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254. Design of dynamic simulation software of water flooding based on unified modeling language (*Open Access*)

Accession number: 20213810907868
Authors: Pan, Shaowei (1); Li, Hui (1); Zhou, Wei (2)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shengli Oilfield Exploration and Development Research Institute, SINOPEC, Dongying; 257100, China
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Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2021 International Conference on Information Technology and Intelligent Control, CITIC 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Guilin, Virtual, China
Conference code: 171600
Publisher: IOP Publishing Ltd
Abstract: The dynamic simulation software of water flooding is of great significance for observing the exploitation of crude oil and understanding the distribution of microscopic remaining oil in the underground reservoirs. Based on Unified Modeling Language (UML), the design of the dynamic simulation software of water flooding is completed. First, based on the results of demand analysis, the function module diagram of the software is established; then the use case diagram is designed to clarify the goals that the software needs to achieve; finally, the class diagram and the sequence diagram of the software are designed, which provides the basis for the specific coding implementation. The design of the dynamic simulation software of water flooding based on UML enriches and develops the theory, technology and method of exploitation geology, and promotes the further application of advanced computer technology in the petroleum industry. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 11
Main heading: Unified Modeling Language
Controlled terms: Application programs - Petroleum reservoir engineering - Gasoline - Petroleum industry
Uncontrolled terms: Advanced computer technology - Class diagrams - Demand analysis - Function module - Remaining oil - Sequence diagrams - Simulation software - Use case diagram
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 523 Liquid Fuels - 723 Computer Software, Data Handling and Applications - 723.1.1 Computer Programming Languages
DOI: 10.1088/1742-6596/2005/1/012191
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Funding text: This paper is supported by the Graduate Innovation and Practice Ability Development Project of Xi'an Shiyou University and its number is YCS19211014.This paper is supported by the Graduate Innovation and Practice Ability Development Project of Xi'an Shiyou University and its number is YCS19211014.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
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255. Insights into enhanced ferromagnetic activity of P doping graphene-ZnO monolayer with point defects

Accession number: 20212610556290
Authors: Wen, Junqing (1); Lin, Pei (1); Han, Yushun (1); Li, Ning (1); Chen, Guoxiang (1); Bai, Lihua (1); Guo, Shaoli (1); Wu, Hua (1); He, Wanlin (1); Zhang, Jianmin (2)
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Corresponding author: Wen, Junqing(wenjq2013@163.com)
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Abbreviated source title: Mater Chem Phys
Volume: 270
Issue date: September 15, 2021
Publication year: 2021
Article number: 124855
Language: English
ISSN: 02540584
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The ferromagnetic properties and origin of P doping graphene-ZnO (g-ZnO) monolayer without or with defects including O vacancy (VO) and Zn vacancy (VZn) are discussed in detail using the first principles method in this paper. In order to describe the electronic structure correctly, the GGA + U (PBE functional in GGA) method is adopted. The most stable structures of P doping g-ZnO monolayer without or with defects including VO and VZn are obtained.

When O atoms in g-ZnO monolayer is replaced by P, the impurity level caused by P is near Fermi level and P-3p orbital is spin polarized, and the system is ferromagnetic. VZn produce weakly bound O-2p electrons, which spin in the same direction and leads to the ferromagnetism of g-ZnO system. Both of the mechanism can be obtained at room temperature. Meanwhile Curie temperature (Tc) of Zn16O15P1 and Zn16O14P2 is higher than room temperature. Therefore, P doping ZnO monolayer is a potential diluted magnetic semiconductor. © 2021 Elsevier B.V.
Number of references: 42
Main heading: Zinc oxide
Controlled terms: Electronic structure - Ferromagnetic materials - Graphene - Binary alloys - II-VI semiconductors - Monolayers - Wide band gap semiconductors - Magnetic semiconductors - Semiconductor doping - Ferromagnetism - Point defects
Uncontrolled terms: Electronic.structure - Ferromagnetic properties - Ferromagnetics - First principle method - O vacancies - P doping ZnO - P-doping - Property - Zn vacancies - ZnO
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 708.4 Magnetic Materials - 712.1 Semiconducting Materials - 761 Nanotechnology - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 933.1.1 Crystal Lattice
DOI: 10.1016/j.matchemphys.2021.124855
Funding Details: Number: YCS21111027, Acronym: -, Sponsor: -; Number: 2019JM-296,2019JQ334, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0667,20JK831, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department;
Funding text: The authors acknowledge computational supports from the Natural Science Foundation of Shaanxi Province of China (grant numbers 2019JM-296 , 2019JQ334), the Scientific Research Plan Projects of Shaanxi Education Department (grant numbers 19JK0667 , 20JK831) and the Training Plan of Innovation and Practice Ability of Postgraduates in Xi'an Shiyou University (grant number YCS21111027).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

256. Electronic, magnetic and photocatalytic properties of Si doping in g-ZnO monolayer with point defects

Accession number: 20213110702081
Authors: Wen, Junqing (1); Li, Ning (1); Lin, Pei (1); Han, Yushun (1); Chen, Guoxiang (1); Bai, Lihua (1); Guo, Shaoli (1); Wu, Hua (1); He, Wanlin (1); Zhang, Jianmin (2)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Xi'an; 710065, China; (2) College of Physics and Information Technology, Shaanxi Normal University, Xi'an; 710062, China
Corresponding author: Wen, Junqing(wenjq2013@163.com)
Source title: Physica E: Low-Dimensional Systems and Nanostructures
Abbreviated source title: Phys E
Volume: 134
Issue date: October 2021
Publication year: 2021
Article number: 114913
Language: English
ISSN: 13869477
CODEN: PELNFM
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: The electronic structures, magnetic properties, magnetic coupling and photocatalytic properties of Si-doping (4 × 4) graphene-like ZnO (g-ZnO) monolayer without or with defects including VO and VZn have been calculated using the first-principles method. Si doping ZnO can increase the electronic state near Fermi level and introduce impurity state into the band gap due to P-type doping. The impurity state introduced by Si doping makes the system transition from NM to FM. The analysis of Ef indicates that Si doping makes ZnO thin films easy to form VZn. VO leads to two weakly bound Zn-4s electrons, VZn leads to two weakly bound O-2p electrons, both of them can form impurity level near Fermi level, thus affecting the magnetic properties of g-ZnO monolayer. The analysis of magnetic coupling characteristics shows that the doping system undergoes a transition from NM to FM. Because the impurity state introduced by Si doping is beneficial to the excitation of electrons, Si doping can also reduce the gap between Fermi level and conduction band. The calculation result of optical properties shows that Si doping has strong absorption to visible light. © 2021 Elsevier B.V.
Number of references: 40

Main heading: Magnetic properties
Controlled terms: Calculations - Monolayers - Photocatalytic activity - Excited states - Fermi level - Graphene - II-VI semiconductors - Optical properties - Binary alloys - Electronic structure - Semiconductor doping - Zinc oxide - Energy gap - Magnetism - Point defects - Silicon
Uncontrolled terms: Coupling properties - Electronic.structure - First principle method - Graphene likes - Impurity state - Photocatalytic property - Property - Si doping graphene-like ZnO - Si-doping - ZnO
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 701.2 Magnetism: Basic Concepts and Phenomena - 712.1 Semiconducting Materials - 741.1 Light/Optics - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 921 Mathematics - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 933.1.1 Crystal Lattice
Numerical data indexing: Time -4.00E+00s
DOI: 10.1016/j.physe.2021.114913
Funding Details: Number: YCS21111031, Acronym: -, Sponsor: -; Number: 11247229,21606177, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JM-296, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0667,20JK0831, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work was supported by the National Natural Science Foundation of China (Grant Nos. 11247229 , 21606177), the Natural Science Foundation of Shaanxi Province of China (Grant No. 2019JM-296), Scientific Research Program Funded by Shaanxi Provincial Education Department (Grant Nos. 19JK0667 , 20JK0831) and the Training Plan of Innovation and Practice Ability of Postgraduates in Xi'an Shiyou University (Grant No. YCS21111031).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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257. Downhole circulating cooling device (*Open Access*)

Accession number: 20212110392509
Authors: Xu, Gao (1); Jing, Zhou (1); Haiming, Xie (1); Haiyan, Shang (1)
Author affiliation: (1) Xi'An Shiyou University, Downhole Measurement and Control Laboratory of National Engineering, Laboratory of Oil and Gas Drilling Technology, Xi an, China
Corresponding author: Xu, Gao(656628638@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1894
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012047
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: This paper presents a kind of downhole circulating cooling device in high temperature environment. The device consists of the following components: compressor, condenser, expansion valve, and heat exchanger. The heat exchanger consists of an inner chamber located around the instrument to be cooled and an outer chamber located around the inner chamber. As the cooling fluid passes through the inner chamber, it absorbs heat from the instrument, and then the cooling fluid enters the outer chamber to absorb heat from the wellbore. After absorbing heat, the cooling liquid can be pressurized by the compressor, condensed by the condenser, and then selectively released back to the inner chamber after cooling by the expansion valve, so as to realize the continuous circulation cooling device, so as to realize the thermal insulation and cooling of the instrument. This paper provides an efficient, recyclable and time-saving

method for temperature reduction in underground high-temperature environment. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Cooling
Controlled terms: Compressors - Heat exchangers - Thermal insulation
Uncontrolled terms: Cooling devices - Cooling fluids - Cooling liquid - Downholes - Expansion valves - High-temperature environment - Temperature reduction - Wellbore
Classification code: 413.2 Heat Insulating Materials - 616.1 Heat Exchange Equipment and Components - 618.1 Compressors - 641.2 Heat Transfer
DOI: 10.1088/1742-6596/1894/1/012047
Funding Details: Number: 51874238, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: XDA14030103, Acronym: CAS, Sponsor: Chinese Academy of Sciences;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

258. Pore structure characteristics of low-rank coal under various degassing temperatures: A case study of lignite from Xishanyao Formation, Turpan-Hami Basin, Xinjiang

Accession number: 20220311486818
Title of translation: -
Authors: Li, Teng (1); Wang, Haichao (2)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Geology and Mining Engineering, Xinjiang University, Urumqi; 830046, China
Source title: Meitan Xuebao/Journal of the China Coal Society
Abbreviated source title: Meitan Xuebao
Volume: 46
Issue date: June 2021
Publication year: 2021
Pages: 414-422
Language: Chinese
ISSN: 02539993
CODEN: MTHPDA
Document type: Journal article (JA)
Publisher: China Coal Society
Abstract: The degassing temperature presents a significant influence on the pore structure of the low-rank coal when the low-temperature nitrogen adsorption measurements are conducted, while the appropriate degassing temperature is still equivocal.Aiming this, the low-rank coal sample collected from Turpan-Hami Basin was used to make low-temperature nitrogen adsorption measurements, and the pore structure characteristics under various degassing temperatures were also investigated.The results show that the coal sample mass decreases continuously with the increased degassing temperatures.When the degassing temperature is lower than 180 , the sample mass loss rate is slow, following that the sample mass loss rate tends to increase, especially when the degassing temperature exceeds 240 , the massive evaporation of the volatiles would lead to the sharp decrease of the sample mass with the increased degassing temperature.When the degassing temperature increases, the hysteresis loops of the coal sample feature continuously decrease, and the knee points of the desorption branch at the relative pressure of 0.5 becomes weaken, indicating the various dynamic change of the pore structure, and the pore structure of the low-rank coal sample varies from complicated to simple.With the increased degassing temperatures, the maximum nitrogen adsorption quantities and the pore volume feature vary in three-step-style, while the pore specific surface area of the low-rank coal decreases, which is dominantly related to the sharply decomposition of the volatile matters in the low-rank coal under high degassing temperature.The continuously decrease of the incremental pore volume and pore specific surface area with the increased degassing temperatures mainly occur at the pores with the aperture below 20 nm, indicating the collapse of these pores contributed dominantly to the decrease of the pore volume and pore specific surface area.Due to the collapse of micropores and partly of mesopores, the pores with larger apertures tend to be concentrated, the average pore apertures present an increasing trend when compared with that of pore specific surface area with the increased degassing temperatures.With higher degassing temperature, due to the massive evaporation of the volatiles and the collapse of the pores, the pore structure has been reformed significantly.When the

degassing temperature is lower than 150 , the differences for the cumulative pore volumes and pore specific surface areas are least, indicating the pore structure still maintains.Therefore, the lower degassing temperature $(\leq 150$) would be an appropriate degassing temperature for the pore structure of the low-rank coal when the low-temperature nitrogen adsorption is used. © 2021, Editorial Office of Journal of China Coal Society. All right reserved.
Number of references: 27
Main heading: Pore structure
Controlled terms: Degassing - Nitrogen - Evaporation - Gas adsorption - Coal - Specific surface area - Temperature
Uncontrolled terms: Coal sample - Degassing temperature - Low rank coals - Low-temperature nitrogen - Low-temperature nitrogen adsorption - Nitrogen adsorption - Pore volume - Pores structure - Structure characteristic - Three-step-style change
Classification code: 524 Solid Fuels - 641.1 Thermodynamics - 802.3 Chemical Operations - 804 Chemical Products Generally - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Size 2.00E-08m
DOI: 10.13225/j.cnki.jccs.2020.1041
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

259. Atomistic simulations of deformation mechanism of fcc/bcc dual-phase high-entropy alloy multilayers

Accession number: 20220211436967
Authors: Ding, B. (1); Song, H.Y. (1); An, M.R. (1); Xiao, M.X. (1); Li, Y.L. (2)
Author affiliation: (1) College of Material Science and Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) School of Aeronautics, Northwestern Polytechnical University, Xi'an; 710072, China
Corresponding authors: Song, H.Y.(gsfshy@sohu.com); Li, Y.L.(liyulong@nwpu.edu.cn)
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Publication year: 2021
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Document type: Journal article (JA)
Publisher: American Institute of Physics Inc.
Abstract: Dual-phase nanoscale lamellar microstructures containing alternating regions of soft phase and hard phase are known to produce alloys with an exceptional combination of strength and plasticity. Here, the effect of layer thickness on the mechanical properties and deformation mechanism of the fcc/bcc dual-phase CoNiFeAlxCu1-x high-entropy alloys multilayers are investigated by the molecular dynamics simulation method. The results show that the deformation behavior of the multilayers is strongly related to the layer thickness. At the yield point, the deformation behavior of the small thickness multilayer is caused by the dislocation slip in the fcc phase, while the plastic deformation of the large thickness multilayer is initiated by the bcc $\rightarrow$ hcp phase transformation in the bcc phase. During the subsequent plastic deformation, the phase transformation of bcc $\rightarrow$ fcc also occurred in the bcc phase of the multilayer, which depended on the relative size of the bcc phase in the multilayer. Especially for the multilayer with the layer thickness of 2 nm, the bcc $\rightarrow$ fcc phase transformation promotes the formation of twins, and the fcc/bcc phase interface transforms into a perfect twin boundary. The twin formation mechanism and phase transformation mechanism are also discussed in detail. © 2021 Author(s).
Number of references: 59
Main heading: Phase transitions
Controlled terms: Aluminum alloys - Entropy - Iron alloys - Molecular dynamics - High-entropy alloys - Binary alloys - Copper alloys - Phase interfaces - Plastic deformation - Cobalt alloys - Multilayers
Uncontrolled terms: BCC phase - Bcc phasis - Deformation behavior - Deformation mechanism - Dual phase - Dual phasis - FCC phase - High entropy alloys - Layer thickness - Phases transformation

Classification code: 531 Metallurgy and Metallography - 541.2 Aluminum Alloys - 543.1 Chromium and Alloys - 544.2 Copper Alloys - 545.2 Iron Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 641.1 Thermodynamics - 801.4 Physical Chemistry
Numerical data indexing: Size 2.00E-09m
DOI: 10.1063/5.0070470
Funding Details: Number: YCS19211006, Acronym: -, Sponsor: -; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2021JZ-53, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
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Compendex references: YES
Database: Compendex
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260. Strengthening mechanism of Al matrix composites reinforced by nickel-coated graphene: Insights from molecular dynamics simulation

Accession number: 20204709512834
Authors: Han, R.Q. (1); Song, H.Y. (1); Wang, J.Y. (1); Li, Y.L. (2)
Author affiliation: (1) School of Material Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Aeronautics, Northwestern Polytechnical University, Xi'an; 710072, China
Corresponding authors: Song, H.Y.(gsfshy@sohu.com); Li, Y.L.(liyulong@nwpu.edu.cn)
Source title: Physica B: Condensed Matter
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Article number: 412620
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Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: The inadequate bonding strength of graphene and metal matrix is a major challenge to improve the mechanical properties of graphene metal-matrix composites. Here, molecular dynamics simulation is performed to investigate the effect of layer thickness on the mechanical properties of the nickel-coated graphene-reinforced aluminum (NGR-Al) matrix nano-multilayers (NMs) under uniaxial tension and compression load. The results show that the Ni coating on the surface of graphene is an effective method to ameliorate the load transfer ability between graphene and metal matrix. There is a critical layer thickness above which the tensile yield strength and the layer thickness obey the Hall-Petch (HP) relation, and under which the inverse HP relation is followed. The results indicate that compared with pure Al, the introduction of Ni-coated graphene makes the sample have a significant plastic strain strengthening effect under compression load, and the smaller the layer thickness is, the better the strengthening effect is. © 2020
Number of references: 44
Main heading: Molecular dynamics
Controlled terms: Aluminum coatings - Reinforcement - Graphene - Multilayers - Metallic matrix composites - Strengthening (metal)
Uncontrolled terms: Al matrix composites - Compression loads - Critical layer thickness - Molecular dynamics simulations - Reinforced aluminum - Strengthening effect - Strengthening mechanisms - Tensile yield strength
Classification code: 531 Metallurgy and Metallography - 531.1 Metallurgy - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 813.2 Coating Materials - 951 Materials Science
DOI: 10.1016/j.physb.2020.412620
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Compendex references: YES

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261. The Influence of New Media on Undergraduates' Learning

Accession number: 20213510822260
Authors: Xu, Xiang-Qian (1); Zhou, Hao-Bin (1); Li, Guo-Ming (2); Liu, Shi-Duo (3)
Author affiliation: (1) Xi'an Shiyou University, School of Material Science and Engineering, Xi'an, China; (2) Changqian Engineering Design Co. Ltd, Xi'an, China; (3) Xi'an Polytechnic University, School of Management, Xi'an, China
Source title: Proceedings - 2021 2nd International Conference on Big Data and Informatization Education, ICBDIE 2021
Abbreviated source title: Proc. - Int. Conf. Big Data Informatiz. Educ., ICBDIE
Part number: 1 of 1
Issue title: Proceedings - 2021 2nd International Conference on Big Data and Informatization Education, ICBDIE 2021
Issue date: April 2021
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Conference name: 2nd International Conference on Big Data and Informatization Education, ICBDIE 2021
Conference date: April 2, 2021 - April 4, 2021
Conference location: Hangzhou, China
Conference code: 170942
Sponsor: Academic Exchange Information Center (AEIC)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The new media has been widely used by the public with the rapid development of mobile network. At the same time, it also has an important impact on the study and life of the public (especially undergraduates). In the new media environment, it is easier and more convenient for undergraduates to acquire knowledge. The phenomenon of learning burnout has appeared in undergraduates and developed with the development of the new media. According to the characteristics of undergraduates' learning, combined with the characteristics and influence of the new media, the causes of the new media on undergraduates' learning burnout were analyzed, on the basis of relevant literature research at home and abroad in the paper. The three characteristics of "fragmented reading", "passive acceptance"and "over dependence"in the new media environment were analyzed respectively. According to the research results and the influence path of the new media on undergraduates' learning, the causes of the new media on undergraduates' learning burnout were found. © 2021 IEEE.
Number of references: 13
Uncontrolled terms: Literature researches - New media - Research results
Classification code: 723.2 Data Processing and Image Processing
DOI: 10.1109/ICBDIE52740.2021.00137
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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262. A new type of POTDR distributed optical fiber sensor

Accession number: 20213510848131
Authors: Zhang, Mian (1, 2)
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Corresponding author: Zhang, Mian(1033167186@qq.com)
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Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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Article number: 9513406
Language: English
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Based on the importance of pipeline monitoring and maintenance in the oil and gas industry, the advantages and advantages of sensors based on the principle of Brillouin Optical Time Domain Reflectance (BOTDR) and Polarized Optical Time Domain Reflectance (POTDR) in oil and gas pipeline monitoring are discussed. Insufficiency, because the BOTDR[1] principle sensor has been applied in the monitoring of oil and gas pipelines, the application value of the POTDR principle sensor in the monitoring of oil and gas pipelines was discussed, and a POTDR[2] sensing system with fiber grating was designed. The grating enhances the intensity of the reflected signal light, which can effectively improve the signal-to-noise ratio of the sensing system and make the measurement of vibration more accurate. Not only vibration, but the influence of pressure, temperature, magnetic field and other physical quantities along the optical fiber will also cause the polarization state of the light wave to change. By collecting and analyzing the change in the polarization state of the light wave, the change in the physical quantity that caused the change in the polarization state of the light wave can be reversed, so as to realize the measurement of physical quantity. The method is stable, feasible, clear in principle, and low in cost, and its application value in the future cannot be underestimated. © 2021 IEEE.
Number of references: 9
Main heading: Reflection
Controlled terms: Gas industry - Optical fibers - Gases - Monitoring - Signal to noise ratio - Polarization
Uncontrolled terms: Distributed optical fiber sensors - ITS applications - Oil and Gas Industry - Oil-and-Gas pipelines - Physical quantities - Pipeline monitoring - Polarization state - Reflected signal
Classification code: 522 Gas Fuels - 716.1 Information Theory and Signal Processing - 741.1.2 Fiber Optics
DOI: 10.1109/ICMSP53480.2021.9513406
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Database: Compendex
Data Provider: Engineering Village
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263. Intelligent control for new topological structure of Z-Source inverter based on ARM

Accession number: 20205309699971
Authors: Liu, Hailong (1, 2); Chen, Jiaona (1)
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Article number: 103735
Language: English
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Document type: Journal article (JA)

Publisher: Elsevier B.V.
Abstract: Due to the defects of Z-source inverter topology, an intelligent method to control topological structure of Z-source inverter based on ARM was put forward. Firstly, the double Z-source networks were connected in series, and then new topology structure of the series double Z-source inverter was designed. The steady-state working principle of the new topology structure was analyzed. Based on the steady-state working principle, ArmCortex-m3 processor and digital single-cycle control strategy were used to control the straight-through duty ratio, so that the soft start control and the intelligent control of Z-source inverter topology were realized. Simulation results show that the ratio between capacitor voltage and input voltage is low when the straight-through duty ratio is small. When the command value of DC-link voltage is 50 V, its command voltage value can be accurately tracked. Therefore, the proposed method has high control performance. © 2020 Elsevier B.V.
Number of references: 24
Main heading: Topology
Controlled terms: Intelligent control - ARM processors - Electric inverters
Uncontrolled terms: Capacitor voltages - Control performance - Control strategies - Intelligent method - Topological structure - Topology structure - Z-source inverter - Z-source networks
Classification code: 721 Computer Circuits and Logic Elements - 723.4.1 Expert Systems - 731.1 Control Systems - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
Numerical data indexing: Voltage 5.00e+01V
DOI: 10.1016/j.micpro.2020.103735
Funding Details: Number: 290088265, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 20JS123, Acronym: -, Sponsor: Education Department of Shaanxi Province;
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264. Infrared Small Target Detection Based on Fusion Full Convolutional Network and Self-Attention

Accession number: 20220411514849
Authors: Duan, Peipei (1); Zhang, Yan (2)
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Corresponding author: Duan, Peipei(duanpei@xsyu.edu.cn)
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Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 12079
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Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE

Abstract: In order to improve the performance of infrared small target detection under complex background and noise interference, a single-stage infrared small target detection algorithm combining deep neural networks and self-attention mechanism is proposed. First, a lightweight fully convolutional neural network based on the encoder-decoder architecture is designed to segment infrared images to achieve background suppression and target enhancement. Then, A self-attentional mechanism is introduced to further suppress false alarms. Finally, an adaptive threshold method is used to separate small targets. As for the network structure adopted here, multiple down-pooling layers are used to reduce. The simulation results show that the algorithm is superior to the typical infrared small target detection algorithm in terms of detection rate, false alarm rate and operation time. It is suitable for infrared small target detection under complex background. © 2021 SPIE
Number of references: 9
Main heading: Deep neural networks
Controlled terms: Image segmentation - Convolutional neural networks - Image enhancement - Complex networks - Convolution - Infrared imaging - Signal detection
Uncontrolled terms: Complex background - Complex noise - Convolutional networks - Fusion full convolutional network - Infrared small targets - Noise interference - Performance - Self-attention - Small target detection - Target detection algorithm
Classification code: 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 722 Computer Systems and Equipment - 746 Imaging Techniques
DOI: 10.1117/12.2622845
Compendex references: YES
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265. Shaking table tests for seismic responses of buried oil and gas pipelines under the excitation of transverse traveling wave effect

Accession number: 20215011302955
Title of translation:
Authors: Dai, Jianbo (1); Hu, Chengtao (1); Wang, Li (2); Zhang, Guidi (1)
Author affiliation: (1) College of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Technology Center, Shaanxi Zhongli Testing and Identification Co., Ltd., Xi'an; 710077, China
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Abbreviated source title: J Vib Shock
Volume: 40
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Issue date: November 28, 2021
Publication year: 2021
Pages: 242-250
Language: Chinese
ISSN: 10003835
Document type: Journal article (JA)
Publisher: Chinese Vibration Engineering Society
Abstract: The buried oil and gas pipeline is an infinitely long linear structure, and the traditional seismic response analysis method may make deviation from the actual situation if the assumption of consistent seismic input is still used for it. To study the seismic response of buried oil and gas pipelines under the seismic excitation of traveling wave effect, a bidirectional laminated shear continuum modelled soil box was developed, a test scheme was designed, and the strain response, acceleration response characteristics and its variation of the pipelines and surrounding soil under the seismic excitation of transverse unanimous earthquake and traveling wave effect were analyzed by shaking table tests. The test results show that the developed modelled soil box is suitable for the analysis requirements of the seismic excitation by traveling wave effect and continuous laminar shear deformation of the soil. The peak strain response at the middle section of the pipeline is larger under the traveling wave effect excitation, the acceleration response of the pipeline is also larger, and the multi-peak characteristics of the response curve are more obvious. The acceleration response of the soil body decreases first and then increases along the burial depth of the soil layer from bottom to top, and its fluctuation range is larger than that by the traveling wave effect excitation. With the increase of loading level, the acceleration response of the pipe is gradually becoming larger than that of the surrounding soil, and the increase is more obvious when excited by the traveling wave effect. When the pipe has been buried in the soil, the interaction between the pipe and the soil will be generated, the gap between the pipe-soil contact surfaces becomes larger under the traveling wave effect excitation, the pipe is then weakerly bound by the surrounding soil, the soil enters

into nonlinear state earlier, and the vibration characteristics of the pipe itself are more apparent. © 2021, Editorial Office of Journal of Vibration and Shock. All right reserved.
Number of references: 14
Main heading: Seismic response
Controlled terms: Soils - Acceleration - Excited states - Earthquakes - Shear flow
Uncontrolled terms: Acceleration response - Bi-directional - Bi-directional laminar shear type model soil box - Buried oil and gas pipeline - Laminar shear - Oil-and-Gas pipelines - Seismic excitations - Shaking table tests - Surrounding soils - Traveling wave effect
Classification code: 483.1 Soils and Soil Mechanics - 484 Seismology - 484.2 Secondary Earthquake Effects - 631.1 Fluid Flow, General - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
DOI: 10.13465/j.cnki.jvs.2021.22.033
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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266. Hough Circle Detection Method for Shaking Instruments in Drilling Field

Accession number: 20220411503630
Authors: Ma, Bo (1, 2); Liu, Hailong (1, 2); Zhang, Qizhi (1, 2)
Author affiliation: (1) School Of Electronic Engineering, Xi'an Shiyou University, Xi'an, China; (2) Shaanxi Provincial Key Lab Of Oil And Gas Well Measurement And Control Technology, Xi'an, China
Source title: Proceedings - 2021 International Conference on Computer Network, Electronic and Automation, ICCNEA 2021
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Issue title: Proceedings - 2021 International Conference on Computer Network, Electronic and Automation, ICCNEA 2021
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Document type: Conference article (CA)
Conference name: 4th International Conference on Computer Network, Electronic and Automation, ICCNEA 2021
Conference date: September 24, 2021 - September 26, 2021
Conference location: Xi'an, China
Conference code: 174432
Sponsor: Belarusian State University of Transport; et al.; Missouri Western State University; State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Control (LANMC); University of Huddersfield; Xi'an Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: At present, the real-time performance of data acquisition has become the key to the development of intelligent drilling. Due to the limitation of stay wire and power supply, the stability of data transmission is not high. In view of the data cannot be collected effectively, machine vision is introduced into the drilling field to automatically judge and read the instruments, there are often fuzzy images of vibration instability in the acquired instrument images. By analyzing the reasons and rules of instrument jitter, a new scheme is proposed. The dithering image is blurred by Wiener filter, and the template matching is made for the initial frame picture. The disc and the center of the circle are obtained from the matched stable image by improved Hough transform, and then they are drawn on the deblurring image. The experiment shows that the error of the circle obtained in this scheme is more stable than the traditional algorithm. © 2021 IEEE.
Number of references: 8
Main heading: Hough transforms
Controlled terms: Data acquisition - Feature extraction - Image enhancement - Infill drilling - Template matching
Uncontrolled terms: Circle detection - Deblurring images - Detection methods - Instrument identification - Intelligent drilling - Machine-vision - Power supply - Real time performance - Wiener filter
Classification code: 511.1 Oil Field Production Operations - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 921.3 Mathematical Transformations
DOI: 10.1109/ICCNEA53019.2021.00028
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267. Conductivity Tensor Measuring and Instrument Design

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Title of translation:
Authors: Chen, Yanjun (1, 2); Zhang, Zhitao (1); Wu, Jie (1, 2)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710000, China; (2) Key Laboratory of Shaanxi Province for Photoelectric Sensing Logging, Xi'an; 710065, China
Corresponding author: Chen, Yanjun(allexist@126.com)
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Abbreviated source title: Hunan Daxue Xuebao
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Publication year: 2021
Pages: 112-117
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ISSN: 16742974
CODEN: HDAXE3
Document type: Journal article (JA)
Publisher: Hunan University
Abstract: The electrical anisotropy of rock is characterized by conductivity tensor. The four-pole method and six-pole method are mostly used to measure rock conductivity in the laboratory, but it is difficult to fill the nine components of conductivity tensor in one experiment. And multiple experiments are easy to cause large measurement errors. For this reason, based on the existing document, this paper designs a conductivity tensor measuring instrument for square sample cores. This solution is also suitable for plunger cores. The completely water-saturated core is replaced by nitrogen. The temperature control system and the confining pressure control system control the temperature and pressure inside the core holder. The upper computer control electrode can be used to measure the core conductivity tensor at different water saturations. The instrument can also be used for rock electrical experiments of plunger cores. Through the measured conductivity data, the unknown coefficients of Archie's formula can be determined. Through the analysis on theoretical and experimental data, the feasibility of the design scheme of the conductivity tensor measuring instrument is verified. © 2021, Editorial Department of Journal of Hunan University. All right reserved.
Number of references: 16
Main heading: Anisotropy
Controlled terms: Computer control systems - Poles - Tensors
Uncontrolled terms: Conductivity tensors - Confining pressures - Electrical anisotropy - Electrical experiments - Instrument designs - Measuring instruments - Temperature and pressures - Unknown coefficients
Classification code: 408.2 Structural Members and Shapes - 723.5 Computer Applications - 731.1 Control Systems - 921.1 Algebra - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.16339/j.cnki.hdxbzkb.2021.02.014
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268. Study on mode shifts of localized surface plasmon cavity in Ag nanowire tetramer (*Open Access*)

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Title of translation: Ag
Authors: Xu, Chao (1); Ding, Ji-Jun (1); Chen, Hai-Xia (1); Li, Guo-Li (1)
Author affiliation: (1) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, College of Science, Xi'an Shiyou University, Xi'an; 710065, China

Corresponding author: Ding, Ji-Jun(jjding@xsyu.edu.cn)
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Article number: 235201
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CODEN: WLHPAR
Document type: Journal article (JA)
Publisher: Institute of Physics, Chinese Academy of Sciences
Abstract: The interaction between noble metal nanowires can induce the local surface plasmonic resonance effect, thereby enhancing the distribution of electric field in the nanostructures, which is of very important significance in improving the fluorescence characteristics and enhancing the sensitivity of sensors. In this study, we design several types of tetramers based on precious metals Ag nanostructures, including cylindrical and prismatic Ag tetramers, and by changing the arrangement and the rotation angle of prism nanowires, we simulate the rotation-angle dependent electric field distribution and electric field intensity of X component, and also discuss the physical mechanism of the relationship between the resonant peak position of absorption spectrum and the change of mode volume. The results show that in the Ag nanowires tetramer structure, the electric field in the cylindrical structure is not enhanced obviously, but the electric field in the prismatic structure is greatly enhanced, and an electric dipole resonance mode is produced in the gap between tetramers. The polarization of plasma resonant cavity revels that the morphology plays a decisive role in generating the hot spots, After changing both the combination mode of tetramer nanowires and the rotation angle of the four-prism, the local surface exciton resonance of the unrotated asymmetric tetramer structure is most ideal and has resonance intensity higher than the that of symmetrical four-prism structure. Therefore, our results provide a structural model and theoretical parameters for the enhancement of electric field intensity by local surface plasmon resonance effect. © 2021 Chinese Physical Society.
Number of references: 23
Main heading: Absorption spectroscopy
Controlled terms: Oligomers - Prisms - Electric fields - Nanowires - Cavity resonators - Surface plasmon resonance - Fabry-Perot interferometers - Morphology - Plasmonics
Uncontrolled terms: Ag nanowire tetramer - Ag nanowires - Electric dipole resonance - Local surface plasmon resonance effect - Local surface plasmon resonances - Plasma resonance - Plasma resonance cavity - Resonance cavities - Surface plasmon resonance effects - Tetramers
Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 741.3 Optical Devices and Systems - 761 Nanotechnology - 815.1.1 Organic Polymers - 931.2 Physical Properties of Gases, Liquids and Solids - 932.3 Plasma Physics - 933 Solid State Physics - 941.3 Optical Instruments - 951 Materials Science
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Compendex references: YES
Open Access type(s): All Open Access, Gold
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269. Effect of CH4 atmosphere on tar yield and quality in coal pyrolysis at low-medium pyrolysis temperature

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Authors: Zhang, Juntao (1); Shi, Runkun (1); Niu, Ben (1); Hu, Haoquan (2); Liang, Shengrong (1); Zhong, Hanbin (1)
Author affiliation: (1) College of Chemistry & Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Chemical Engineering, Dalian University of Technology, Dalian; 116024, China
Corresponding author: Niu, Ben(wsniuben@163.com)
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Document type: Journal article (JA)
Publisher: China Coal Society
Abstract: The composition of coal pyrolysis products can be regulated by hydrogen-rich atmosphere.Understanding regulatory mechanism of products can promote process optimization and industrialization.The coal pyrolysis experiments using Naomaohu coal as coal sample were performed in a fixed bed reactor in N2, H2 and CH4 atmospheres.In this paper, tar yield, the contents of each fraction and composition in tar from coal pyrolysis at different reaction temperatures and atmospheres were compared to understand the role of CH4 in coal pyrolysis at low-medium pyrolysis temperature (400-700).The results show that the tar yield of coal pyrolysis is enhanced in CH4 atmosphere above 600.The tar yield in CH4 atmosphere is slightly higher than that in N2 atmosphere at 600.The tar yield in CH4 atmosphere is significantly higher than that in N2 atmosphere at 650, and lower than that in H2 atmosphere.The simulated distillation results show that light oil and naphthalene oil are mainly produced below 450 during coal pyrolysis, the formation temperatures of wash oil and asphaltene are mainly concentrated below 600, and the formation temperatures of phenol oil and anthracene oil are concentrated below 500 and 550, respectively.The content of anthracene oil in tar is enhanced in CH4 atmosphere above 600.When the temperature is higher than 650, the CH4 is conducive to the formation of each fraction in tar, of which light oil and phenol oil are greatly increased.The content of light oil is higher than that in H2 atmosphere, and the content of phenol oil is basically the same as that in H2 atmosphere.The GC/MS results show that the formation temperatures of aliphatic hydrocarbons, olefins, ester and alcohol compounds are mainly concentrated below 450 during coal pyrolysis, and the formation temperatures of aromatics and phenolic compounds are concentrated below 600.The contents of phenolic and alcohol compounds in tar are enhanced in CH4 atmosphere above 600.The contents of aliphatic hydrocarbons, aromatics, olefins, ester, and alcohol compounds in tar are enhanced in CH4 atmosphere above 650.The content of phenolic compounds is greatly increased, which is slightly lower than that in H2 atmosphere.The CH4 can provide•H and•CHx for coal pyrolysis to participate the stability of coal pyrolysis free radicals and the secondary reaction of primary volatiles, when the temperature is higher than 600. © 2021, Editorial Office of Journal of China Coal Society. All right reserved.
Number of references: 20
Main heading: Coal
Controlled terms: Naphthalene - Aromatization - Coal tar - Optimization - Reaction rates - Chemical reactors - Free radicals - Anthracene - Olefins - Esters - Phenols - Surface properties - Atmospheric temperature - Distillation - Pyrolysis
Uncontrolled terms: Fixed bed reactor - Formation temperature - Phenolic compounds - Pyrolysis temperature - Reaction temperature - Regulatory mechanism - Secondary reactions - Simulated distillation
Classification code: 411.2 Coal Tar - 443.1 Atmospheric Properties - 524 Solid Fuels - 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.1 Organic Compounds - 921.5 Optimization Techniques - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.13225/j.cnki.jccs.2019.1770
Compendex references: YES
Database: Compendex
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270. Tuning the electronic and magnetic properties of defect blue phosphorene by the adsorption of nonmetal atoms (*Open Access*)

Accession number: 20215111370264
Authors: An, Guo (1); Chen, Guoxiang (1); Chen, Xiaona (1); Zhang, Jianmin (2)
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Corresponding author: Chen, Guoxiang(guoxchen@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
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Issue title: 2021 2nd International Conference on Applied Physics and Computing, ICAPC 2021 - 1. Applied Physics
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Language: English
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Conference name: 2021 2nd International Conference on Applied Physics and Computing, ICAPC 2021
Conference date: September 8, 2021 - September 10, 2021
Conference location: Ottawa, ON, Canada
Conference code: 175431
Publisher: IOP Publishing Ltd
Abstract: Based on the first principles of density functional theory, the adsorption of nonmetallic atoms on the surface of defective blue phosphorene was investigated. The results show that the most stable sites of different nonmetallic atoms on the defect blue phosphorene are different. The nonmetal (B, C, N, O) atoms were adsorbed on SV and SW defects blue phosphorene respectively. It was observed that B, N adsorbed SV defect blue phosphorene systems exhibited semiconducting behavior, whereas O adsorbed SV defect blue phosphorene system exhibited metallic behavior, and C adsorbed SV defect blue phosphorene system exhibited magnetic semiconducting behavior. For SW defect blue phosphorene, the results show that B, N adsorbed SW defect blue phosphorene showed magnetic semiconductor behavior, while C, O adsorbed SW defect blue phosphorene showed semiconductor behavior. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 10
Main heading: Magnetism
Controlled terms: Magnetic semiconductors - Adsorption - Atoms - Density functional theory
Uncontrolled terms: Blue phosphorene - Density-functional-theory - Electronic and magnetic properties - First principles - Metallic behaviors - Non-metallic - Semiconducting behavior - Semiconductor behaviours
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 708.4 Magnetic Materials - 712.1 Semiconducting Materials - 802.3 Chemical Operations - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
DOI: 10.1088/1742-6596/2083/2/022065
Funding Details: Number: YCS20212131, Acronym: -, Sponsor: -; Number: 11304246,11947112, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work is supported by the National Natural Science Foundation of China (Grant nos. 11304246 and 11947112), and the Postgraduate Innovation and Practical Ability Training Program of Xi'an Shiyou University (Grant no. YCS20212131).
Compendex references: YES
Open Access type(s): All Open Access, Gold
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271. Analysis of microscopic main controlling factors for occurrence of movable fluid in tight sandstone gas reservoirs based on improved grey correlation theory (*Open Access*)

Accession number: 20213610856109
Authors: Lu, Xuefei (1); Dong, Fengjuan (2, 3); Wei, Xiaolong (4); Wang, Pengtao (5); Liu, Na (6, 7); Ren, Dazhong (2, 3)
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Source title: Mathematical Problems in Engineering

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Article number: 3158504
Language: English
ISSN: 1024123X
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Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Tight sandstone reservoirs have the characteristics of poor physical properties, fine pore throats, and strong microheterogeneity compared with conventional reservoirs, which results in complicated movable fluid occurrence laws and difficult mining. Taking the tight sandstone gas reservoir of He 8 formation in Sulige gas field as an example, based on physical property test analysis, constant velocity mercury injection, and nuclear magnetic resonance experiments, an optimized gray correlation calculation model is established by improved gray correlation theory, which quantitatively characterizes the influence of microscopic pore structure parameters of different types of tight sandstone gas reservoirs on the occurrence of movable fluids, and the main controlling microgeological factors for the occurrence of movable fluid in tight sandstone gas reservoirs with close/similar physical properties are selected. The results show that the occurrence of movable fluid in Type I reservoirs is mainly affected by the effective pore-throat radius ratio, the saturation of mercury in the total throat, and the effective pore radius, and the occurrence of movable fluid in Type II reservoirs is mainly affected by the effective throat radius per unit volume and total throat mercury saturation and mainstream throat radius. Moreover, the occurrence state of movable fluids in Type II reservoirs is controlled by the throat radius stronger than that of Type I reservoirs. It has important guiding significance for the efficient development of tight sandstone gas reservoirs. © 2021 Xuefei Lu et al.
Number of references: 31
Main heading: Gases
Controlled terms: Sandstone - Physical properties - Tight gas - Mercury (metal) - Gas industry - Petroleum reservoirs - Pore structure
Uncontrolled terms: Constant velocities - Effective pore radius - Grey correlation theories - Guiding significances - Main controlling factors - Microscopic pore structures - Tight sandstone gas - Tight sandstone reservoirs
Classification code: 482.2 Minerals - 512.1.1 Oil Fields - 512.2 Natural Gas Deposits - 522 Gas Fuels - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1155/2021/3158504
Funding Details: Number: KF2021-3, Acronym: -, Sponsor: -; Number: 20JS120, Acronym: -, Sponsor: -; Number: 41802166,51934005, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China; Number: 2021GY-140, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: This work was financially supported by the National Natural Science Foundation of China (41802166 and 51934005), Shaanxi Provincial Key Research and Development Program (2021GY-140), Opening Foundation of Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs (20JS120), Open Foundation of Key Laboratory of Coal Resources Exploration and Comprehensive Utilization, Ministry of Natural Resources (KF2021-3), and Shaanxi Provincial Key Research and Development Program (2021GY-140).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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272. Collaborative Control and Optimization of QoS in 5G and Industrial SDN Heterogeneous Networks for Smart Factory

Accession number: 20222612295057
Authors: Jin, Qibing (1); Guo, Qing (1); Niu, Yaxu (1); Wang, Zeyu (1); Luo, Mingshi (2)
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Issue title: Proceedings - 2021 IEEE International Conference on Space-Air-Ground Computing, SAGC 2021
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Conference name: 2021 IEEE International Conference on Space-Air-Ground Computing, SAGC 2021
Conference date: October 23, 2021 - October 25, 2021
Conference location: Huizhou, Guangdong, China
Conference code: 179793
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The 5th generation mobile communication system (5G) and industrial Software Defined Network (SDN) heterogeneous network architecture is the main networking method for the production management network of smart factories in the future. High data rate, low latency and mobility are the characteristics of those production management applications accessed by 5G. This paper analyzes the problems of QoS guarantee in heterogeneous networks of 5G and industrial SDN, and proposes a QoS collaborative control architecture for heterogeneous networks. The new architecture introduces the Flow QoS-coordinator functional entity, and defines the QoS collaborative control process among the entity, application systems,5G and industrial SDN networks. This paper introduces the network slicing capability in industrial SDN network, and constructs a traffic flow path network model. Considering the sensitivity of data transmission delay in industrial production management applications, the SDN flow path planning and global dynamic optimization method based on the dual parameters of communication rate and transmission delay are given. The scheme improves the real-time performance of flow path planning for new access services, and ensures the QoS of these existing services. Establishing QoS flows dynamically for application services avoids reserving too much bandwidth for these highly mobile and high-speed services, which can reduce the cost of network construction. © 2021 IEEE.
Number of references: 11
Main heading: Heterogeneous networks
Controlled terms: 5G mobile communication systems - Information management - Memory architecture - Motion planning - Network architecture - Radio broadcasting
Uncontrolled terms: 5g - Collaborative control - Collaborative control of QoS - Dynamic optimization - Flow path network model - Flow-path networks - Global dynamic optimization - Global dynamics - Industrial software - Industrial software defined network - Multi objective - Multi-objective path planning - Network models - Software-defined networks
Classification code: 716.3 Radio Systems and Equipment - 722 Computer Systems and Equipment
Numerical data indexing: Mass 5.00E-03kg
DOI: 10.1109/SAGC52752.2021.00022
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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273. Research of Boost Converter Sliding Mode Control Method Based on Exponential Reaching Law

Accession number: 20220411503642
Authors: Dang, Chunyong (1); Zhang, Qizhi (2)
Author affiliation: (1) Xi'an Shiyou University, School Of Electronic Engineering, Xi’an, China; (2) Shaanxi Provincial Key Lab Of Oil And Gas Well, Measurement And Control Technology, Xi’an, China
Source title: Proceedings - 2021 International Conference on Computer Network, Electronic and Automation, ICCNEA 2021
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
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Conference name: 4th International Conference on Computer Network, Electronic and Automation, ICCNEA 2021

Conference date: September 24, 2021 - September 26, 2021
Conference location: Xi'an, China
Conference code: 174432
Sponsor: Belarusian State University of Transport; et al.; Missouri Western State University; State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Control (LANMC); University of Huddersfield; Xi'an Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Due to the nonlinear structure of boost converter, the traditional PI controller can ensure the boost converter to work stably near the rated point, and achieve good dynamic and steady-state performance. When the working state of boost converter deviates greatly from the rated point, its stability cannot be guaranteed. Therefore, in order to solve the problem that the dynamic performance and stability of boost converter are insufficient when it deviates from the rated working state, the mathematical model of third-order sliding mode controller is established by adding voltage dynamic error state variable on the basis of second-order sliding mode boost converter. The exponential reaching law is applied to the third-order sliding mode controller, which can effectively reduce the overshoot in the start-up phase; when the input voltage changes suddenly, the load has strong robustness. The paper built the Simulink module, and through the Matlab/Simulink, the effectiveness of the algorithm is verified. © 2021 IEEE.
Number of references: 16
Main heading: Sliding mode control
Controlled terms: Controllers - Boost converter - Exponential functions
Uncontrolled terms: BOOST converter - Control methods - Exponential reaching law - Nonlinear structure - PI Controller - Simulink - Sliding mode controller - Sliding-mode control - Third order sliding modes - Working state
Classification code: 704.1 Electric Components - 731.1 Control Systems - 732.1 Control Equipment - 921 Mathematics
DOI: 10.1109/ICCNEA53019.2021.00075
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Compendex references: YES
Database: Compendex
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274. Effect of modulation ratio on structure and mechanical properties of WB2/CrN films deposited by direct-current magnetron sputtering

Accession number: 20203609149431
Authors: Liu, Yanming (1); Tian, Li (1); Chang, Jianxiu (1); An, Minrong (1); Pei, Zhiliang (2); Fan, Di (2)
Author affiliation: (1) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an, 710065, China; (2) Institute of Metal Research, Chinese Academy of Sciences, Shenyang; 110016, China
Corresponding authors: Pei, Zhiliang(zlpei@imr.ac.cn); Fan, Di(dfan11s@alum.imr.ac.cn)
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Publication year: 2021
Article number: 156852
Language: English
ISSN: 09258388
CODEN: JALCEU
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: WB2/CrN multilayer films with thick modulation period about 500 nm but different modulation ratios (tWB2:tCrN = 1.2, 2, 3 and 4) were deposited on steel substrates by magnetron sputtering, and the effect of modulation ratio on the structure, residual stress and tribo-mechanical properties of the WB2/CrN multilayer films was systematically studied. Additionally, WB2 and CrN monolayer films with various thicknesses were also prepared to discuss the growth behavior and the related properties of the WB2/CrN multilayer films. All the sample films present the columnar growth, and the particle size in the WB2 monolayers is smaller than that in the corresponding WB2 sublayers. The preferred orientation of WB2 (260–400nm) and CrN monolayers (132–220 nm) is (101) and (111), respectively. However, the multilayered structure changes the orientation of CrN sublayers to (002), and

crystalline Cr2N phase is detected in WB2/CrN multilayers caused by the element diffusion at interface. Moreover, the multilayered structure reduces the compressive stress of the WB2 films greatly by diffusion of point defects to interfaces and an indirect effect of interfaces on stress via film structure with soft CrN, and the residual stress of the WB2, CrN and WB2/CrN films is $_{-2.64\sim-4.16}$, -0.85–0.57 and $_{-1.49\sim-2.61}$ GPa, respectively. Furthermore, film hardness ranging from 27.9 to 33.0 GPa mainly obeys the rule of mixture. The adhesive strength drops greatly from 26 to 17 N with the increasing tWB2:tCrN, and the tensile CrN bottom-layer deteriorates the adhesive strength of the WB2/CrN multilayers with tWB2:tCrN = 2. Overall, WB2/CrN films with tWB2:tCrN = 3 show better wear resistance with lower friction coefficient $_{\sim 0.35}$ and wear rate about 3.6 × 10-7 mm3/mN benefiting from their higher hardness, lower roughness, proper toughness and compressive stress. © 2020 Elsevier B.V.
Number of references: 47
Main heading: Magnetron sputtering
Controlled terms: Adhesives - Compressive stress - Modulation - Hardness - Point defects - Wear of materials - Friction - Monolayers - Multilayer films - Wear resistance - Particle size - Multilayers - Residual stresses
Uncontrolled terms: Adhesive strength - Direct current magnetron sputtering - Element diffusion - Friction coefficients - Indirect effects - Modulation period - Multi-layered structure - Preferred orientations
Classification code: 931.2 Physical Properties of Gases, Liquids and Solids - 933.1.1 Crystal Lattice - 951 Materials Science
Numerical data indexing: Force 2.60e+01N to 1.70e+01N, Pressure 2.79e+10Pa to 3.30e+10Pa, Size 5.00e-07m
DOI: 10.1016/j.jallcom.2020.156852
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Funding text: This work was supported by the Natural Science Foundation of China (No.51701157), the Innovation Team Funding by Xi'an Shiyou University (Project No.2019QNKYCXTD12), National Science and Technology Major Project (2017-VI-0019-0019), the Natural Science Foundation of Shaanxi Province of China (No. 2018JQ5198), and the Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 19JK0672).This work was supported by the Natural Science Foundation of China (No. 51701157), the Innovation Team Funding by Xi'an Shiyou University (Project No. 2019QNKYCXTD12), National Science and Technology Major Project (2017-VI-0019-0019), the Natural Science Foundation of Shaanxi Province of China (No. 2018JQ5198), and the Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 19JK0672).
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Database: Compendex
Data Provider: Engineering Village
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275. Improved Single Haze Removal Algorithm Based on Color Attenuation Prior

Accession number: 20221311844080
Authors: Liu, Lijin (1); Cheng, Guojian (1, 2); Zhu, Jiadong (1)
Author affiliation: (1) School of Intelligent Science and Information Engineering, Xi'an Peihua University, Shannxi, Xi'an, China; (2) School of Computer Science, Xi'an Shiyou University, Shaanxi, Xi'an, China
Corresponding author: Liu, Lijin(aug_liu@163.com)
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Abbreviated source title: Proc. IEEE Int. Conf. Inf. Technol., Big Data Artif. Intell., ICIBA
Part number: 1 of 1
Issue title: Proceedings of 2021 IEEE 2nd International Conference on Information Technology, Big Data and Artificial Intelligence, ICIBA 2021
Issue date: 2021
Publication year: 2021
Pages: 1166-1170
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ISBN-13: 9781665428767
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Conference name: 2nd IEEE International Conference on Information Technology, Big Data and Artificial Intelligence, ICIBA 2021
Conference date: December 17, 2021 - December 19, 2021
Conference location: Chongqing, China
Conference code: 176951

Sponsor: Chengdu Union Institute of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Chongqing University of Technology; Global Union Academy of Science and Technology; IEEE Beijing Section
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: With continuous development and application of computer vision, images with high clarity and quality are increasingly important in training different kinds of models, especially in the field of automated driving and road safety monitoring. In this paper, through learning on the benchmarking dataset, we propose a novel quadratic model of color attenuation prior to calculate the scene depth map and then obtain the transmission matrix and restore the hazy-free image. Numerous experimental results show that the proposed approach is more accurate on sculpt the correlation between scene brightness, saturation and depth, therefore it outperforms the linear model in terms of both dehazing effect and clarity. Meanwhile, the objective and subjective comparison with the other state-of-the-art algorithms on the hazy images demonstrate the efficiency and effectiveness of the proposed method. © 2021 IEEE.
Number of references: 12
Main heading: Color
Controlled terms: Demulsification - Motor transportation
Uncontrolled terms: Automated driving - Automated roads - Color attenuation prior - Continuous development - Development and applications - Driving safety - Haze removal - Quadratic modeling - Removal algorithms - Transmission matrix
Classification code: 741.1 Light/Optics - 802.3 Chemical Operations
DOI: 10.1109/ICIBA52610.2021.9687882
Funding Details: Number: PHKT2007, Acronym: -, Sponsor: -;
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Data Provider: Engineering Village
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276. Research progress on conversion of CO2 to cyclic carbonates catalyzed by metal complexes

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Title of translation: CO2
Authors: Wang, Wenzhen (1); Zhao, Saidi (1); Wang, Li (1, 2); Wu, Jindi (1); Huang, Jian (1); Liu, Zexu (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) State Key Laboratory of Coordination Chemistry, Nanjing University, Nanjing; 210093, China
Source title: Jingxi Huagong/Fine Chemicals
Abbreviated source title: Jingxi Huagong
Volume: 38
Issue: 10
Issue date: October 15, 2021
Publication year: 2021
Pages: 1956-1961
Language: Chinese
ISSN: 10035214
CODEN: JIHUFJ
Document type: Journal article (JA)
Publisher: Fine Chemicals
Abstract: The cycloaddition reaction of CO2 and epoxy compounds to prepare cyclic carbonates acid has the characteristics of 100% atom economy and environmental friendliness, which is beneficial to alleviate the greenhouse effect and turn waste into treasure, and has important theoretical and practical significance. The development of novel and efficient catalytic system is the key to the smooth and rapid process of the reaction. In recent years, the catalytic system of metal complexes is most used in the cycloaddition reaction of epoxy compounds and CO2, and shows the best the catalytic effect. The research progress on catalytic systems of metal complexes such as main group metals, transition metals, lanthanide metals and 3d-4f metals in the cycloaddition reaction of CO2 and epoxy compounds is summarized. This review provides important reference for the synthesis of new and efficient catalyst systems of metal complexes in the future. © 2021, Editorial Office of FINE CHEMICALS. All right reserved.
Number of references: 53
Main heading: Carbon dioxide

Controlled terms: Carbonates - Greenhouse effect - Catalysts - Synthesis (chemical) - Greenhouse gases - Transition metals - Cycloaddition - Metal complexes
Uncontrolled terms: Atom economy - Catalytic system - Cyclic carbonates - Cycloaddition reaction - Economy and environmental - Environmental friendliness - Epoxy compound - Greenhouses gas - Rapid process -]+ catalyst
Classification code: 443.1 Atmospheric Properties - 451 Air Pollution - 451.1 Air Pollution Sources - 531 Metallurgy and Metallography - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 1.00E+02%
DOI: 10.13550/j.jxhg.20210338
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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277. Effect of modulation period on structure and mechanical properties of WB2/a-WBC films deposited by direct-current magnetron sputtering

Accession number: 20214611155191
Authors: Liu, Yanming (1); Zhao, Xingxing (1); Tian, Li (1); Wang, Chen (1); Pei, Zhiliang (2)
Author affiliation: (1) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an 710065, China; (2) Institute of Metal Research, Chinese Academy of Sciences, Shenyang; 110016, China
Corresponding author: Liu, Yanming(ymliu10s@alum.imr.ac.cn)
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Volume: 739
Issue date: December 1, 2021
Publication year: 2021
Article number: 138994
Language: English
ISSN: 00406090
CODEN: THSFAP
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: WB2/a-WBC multilayer films with different modulation periods ranging from 145 to 830 nm were synthesized by direct-current magnetron sputtering. The effect of modulation period (Λ) on structure and tribo-mechanical properties of the WB2/a-WBC multilayer films was studied. The WB2 monolayer grows preferentially along (101) plane. However, the multilayered structure changes the growth of WB2 sublayers to (001) plane, and a transition layer with composition gradient distribution is formed at the interface between the two sublayers. Consequently, WB2, WB2(C) solid solution and a-WC are detected in the WB2 sublayer, while a-WBC, a-WC and a-C are found in the WBC sublayer. As the modulation period decreases, the residual compressive stress $(-384\sim-827$ MPa) of the WB2/a-WBC films increases first and then decreases, and the hardness of the WB2/a-WBC films $(18.8\sim23.7$ GPa) gradually increases under the joint action of solid solution strengthening and interface strengthening. Moreover, the fracture toughness of the WB2/a-WBC films is also improved greatly resulting from the multilayered structure with the soft a-WBC sublayers. The wear mechanism of the WB2/a-WBC films is a mixture of abrasion and lubrication, and the friction coefficient and wear rate of the WB2/a-WBC films are lower than those of the WB2 and WBC monolayer films because of their excellent toughness and lubricating effect as well as moderate hardness. Comprehensively, the WB2/a-WBC films with =830 and 415 nm display lower friction coefficient (~0.08) and wear rate $(1.14\sim1.24$ × 10-7 mm3/mN). © 2021
Number of references: 34
Main heading: Magnetron sputtering
Controlled terms: Multilayer films - Multilayers - Solid solutions - Tribology - Fracture toughness - Friction - Wear of materials - Hardness - Monolayers - Modulation
Uncontrolled terms: Amorphous tungsten borocarbide - Borocarbides - Direct current magnetron sputtering - Direct-current magnetron sputtering - Magnetron-sputtering - Modulation period - Multilayers films - Sub-layers - Tribo-mechanical property - Tungsten borides
Classification code: 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 933 Solid State Physics - 951 Materials Science
Numerical data indexing: Pressure -8.27E+08Pa, Pressure 2.37E+10Pa, Size 1.24E-10m, Size 1.45E-07m to 8.30E-07m, Size 4.15E-07m, Size 8.30E-07m
DOI: 10.1016/j.tsf.2021.138994

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Compendex references: YES
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Data Provider: Engineering Village
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278. Research progress of light irradiation stability of functional layers in perovskite solar cells (*Open Access*)

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Title of translation:
Authors: Li, Yan (1); He, Hong (1); Dang, Wei-Wu (2); Chen, Xue-Lian (1); Sun, Can (1); Zheng, Jia-Lu (1)
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Corresponding author: Li, Yan(li1988yan@163.com)
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Document type: Journal article (JA)
Publisher: Institute of Physics, Chinese Academy of Sciences
Abstract: The low-cost, high-efficiency and easy fabrication of perovskite solar cells make them an ideal candidate for replacing industrialized silicon solar cells, and thus reforming the current energy supply structure. However, the industrialization of perovskite solar cells is now restricted due to its poor stability. In this article, the intrinsic ion migration behavior in the perovskite film under light irradiation is introduced, which is mainly responsible for hysteresis, fluorescence quenching/enhancement and the failure of solar cell. In addition, the typical ultraviolet light instability of TiO2/perovskite interface, and the light instability of hole transport layer and metal electrodes are also discussed subsequently. As a light-dependent device, improving its light radiation stability is essential for making it suitable to various environmental applications. © 2021 Chinese Physical Society.
Number of references: 132
Main heading: Perovskite solar cells
Controlled terms: Costs - Irradiation - Quenching - Stability - Titanium dioxide - Perovskite
Uncontrolled terms: Easy fabrication - Environmental applications - Functional layer - Hole transport layers - Light irradiations - Metal electrodes - Perovskite films - Ultra-violet light
Classification code: 482.2 Minerals - 537.1 Heat Treatment Processes - 702.3 Solar Cells - 804.2 Inorganic Compounds - 911 Cost and Value Engineering; Industrial Economics
DOI: 10.7498/aps.70.20201762
Funding Details: Number: YS37020203, Acronym: -, Sponsor: -; Number: YCS20212115, Acronym: -, Sponsor: -; Number: -, Acronym: XJTU, Sponsor: Xi’an Jiaotong University; Number: 2018JQ-5130,2019JQ-286, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0660,20JK0507, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: Project supported by the Natural Science Foundation Research Project of Shaanxi Province, China (Grant Nos. 2019JQ-286, 2018JQ-5130), the Scientific Research Program Funded by Shaanxi Provincial Education Department, China (Grant Nos. 19JK0660, 20JK0507), the State Key Laboratory of Metal Material Strength of Xi'an Jiaotong University, China, the Materials Science and Engineering of Provincial Advantage Disciplines in Xi'an Shiyou University, China (Grant No. YS37020203), and the Postgraduate Innovation and Practical Ability Training Program of Xi'an Shiyou University, China (Grant No. YCS20212115)* Project supported by the Natural Science Foundation Research Project of Shaanxi Province, China (Grant Nos. 2019JQ-286, 2018JQ-5130), the Scientific Research

Program Funded by Shaanxi Provincial Education Department, China (Grant Nos. 19JK0660, 20JK0507), the State Key Laboratory of Metal Material Strength of Xi'an Jiaotong University, China, the Materials Science and Engineering of Provincial Advantage Disciplines in Xi' an Shiyou University, China (Grant No. YS37020203), and the Postgraduate Innovation and Practical Ability Training Program of Xi'an Shiyou University, China (Grant No. YCS20212115). †
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279. Performance analysis for complex-valued FastICA and its improvement based on the Tukey M-estimator

Accession number: 20212110403436
Authors: E, Jianwei (1); Ye, Jimin (1); He, Lulu (1); Jin, Haihong (2)
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Corresponding author: Ye, Jimin(jmye@mail.xidian.edu.cn)
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Article number: 103077
Language: English
ISSN: 10512004
CODEN: DSPREJ
Document type: Journal article (JA)
Publisher: Elsevier Inc.
Abstract: Independent component analysis (ICA) is increasingly utilized to modern digital signal processing. Complex-valued FastICA, a fast fixed-point algorithm for ICA, is one of the most non-trivial algorithms for solving the ICA problems in the complex domain. Hitherto, there have been several attempts to give performance analysis for complex-valued FastICA. Rigorous theoretical analysis, however, still has room for improvement further. Consequently, the purposes of this paper are threefold: Firstly, the uniformity of the complex-valued FastICA estimator is constructed for the first time. Secondly, the stability of the complex-valued ICA algorithm is rigorously deduced based on the augmented generating matrix. Meanwhile, the local convergence of complex-valued FastICA algorithm is derived based on circular source signals. Finally, for improving the performance of separation, we select a novel alternative for nonlinearity based on the Tukey M-estimator in the complex-valued FastICA algorithm. Further, we prove the existence of local optimal solution and stability of the complex ICA problem based on the Tukey M-estimator. Simulations are presented to demonstrate the accuracy of our analysis. Additionally, the experimental results with synthetic data and complex-valued wind signal show the superiorities of the improved method. © 2021 Elsevier Inc.
Number of references: 45
Main heading: Independent component analysis
Controlled terms: Digital signal processing
Uncontrolled terms: Circular sources - FastICA algorithms - Fixed-point algorithms - Independent component analysis(ICA) - Local Convergence - Local optimal solution - Non-trivial algorithms - Performance analysis
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Database: Compendex
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280. Investigation on tunable electronic properties of semiconducting graphene induced by boron and sulfur doping

Accession number: 20205209680349
Authors: Qu, Yongfeng (1); Ding, Jijun (1); Fu, Haiwei (1); Chen, Haixia (1); Peng, Jianhong (2)
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Abstract: The density functional theory (DFT) simulation is performed to systematically investigate the doping effect of the boron (B) and sulfur (S) atoms on the electronic and adsorption properties of graphene. B and S atom doping provide the means of regulating the electronic properties of graphene. Most interesting, semiconducting graphene induced by B and S doping is achieved, including the observation that the bandgap of graphene can be opened and graphene can be modulated to form the n- and p-type nature. The doping effect of graphene is determined by B and S atom ratio. In detail, when the B to S ratio is less than 2, graphene shows n-type. Conversely, it exhibits a p-type conductivity. Meanwhile, simulations reveal the crucial role played by the vacancy defects in graphene leading to p-type nature. The increasing S atom doping around the vacant site can cause the transformation behavior of graphene from p to n-type. Our work focus on the synergistic effect of B and S doping on the electronic properties and adsorption properties of graphene. Results indicate that B and S doping offers a new possibility of tuning the electronic and adsorption properties of graphene at the atomic level, providing guidance for future homogeneous p-n junction design used in the advanced nanoelectronic devices. © 2020 Elsevier B.V.
Number of references: 43
Main heading: Electronic properties
Controlled terms: Adsorption - Atoms - Boron - Density functional theory - Semiconductor junctions - Design for testability - Sulfur - Graphene
Uncontrolled terms: Adsorption properties - Electronic properties of graphene - Nanoelectronic devices - P type conductivity - Synergistic effect - Transformation behavior - Tunable electronic properties - Vacancy Defects
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 714.2 Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 802.3 Chemical Operations - 804 Chemical Products Generally - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
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281. Tilted fiber Bragg grating fixed in a polypropylene tube for ultrasonic sensing and imaging of simulated geological models

Accession number: 20211310139993
Authors: Gang, Tingting (1, 2); Zhang, Xuan (1, 2); Sun, Ruijuan (1)
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Language: English
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Publisher: Elsevier Ltd
Abstract: A fiber ultrasonic sensor based on tilted fiber Bragg grating (TFBG) is proposed and demonstrated both in theory and experiment. The sensor probe is packaged in a sturdily tilted polypropylene tube resulting improvements in great stability and direction dependence. In experiments, the proposed sensor performs a high ultrasonic wave (UW) sensitivity and thus it can obtain layers information in rock models. After scanning slope and surface seismic physical models, cross-section imaging of models is achieved finally by data processing and reconstruction. © 2021 Elsevier Ltd
Number of references: 18
Main heading: Polypropylenes
Controlled terms: Data handling - Geology - Fiber Bragg gratings
Uncontrolled terms: A.Fibres - Direction dependence - Geological models - Imaging of simulated geological model - Polypropylene tubes - Rock models - Sensing and imaging - Sensor probes - Tilted fiber Bragg grating - Ultrasonic sensing
Classification code: 481.1 Geology - 723.2 Data Processing and Image Processing - 815.1.1 Organic Polymers
DOI: 10.1016/j.optlastec.2021.107075
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282. An adaptive magnetization structure and method for low field NMR two-phase flow measurement (*Open Access*)

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Authors: Li-Pin, L.I. (1); Rui-Qiang, Han (1); Yan-Qun, Huang (2); Huan, Chen (1)
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Publisher: IOP Publishing Ltd
Abstract: In low field NMR multiphase flow measurement, the magnetization time and magnetization length are affected by the two-phase flow velocity and water fraction, so it is difficult to realize the complete magnetization of multiphase flow with fixed length magnet. In this paper, an adaptive magnetization structure for two-phase flow is proposed. The pre-magnetization model of the adaptive structure is established based on the magnetization theory of nuclear magnetic resonance. And parameters of the adaptive magnetization structure are determined by analyzing the influence of two-phase flow parameters such as velocity and water fraction on magnetic susceptibility. Finally, the

simulation analysis shows that the adaptive magnetization structure can achieve complete magnetization effect for two-phase flow in the range of water fraction 0-36% and flow rate 0-4.66m/s, which provides the necessary conditions for the accurate measurement of NMR two-phase flow and provides a new idea for the design of NMR two-phase flow measurement sensor. © Published under licence by IOP Publishing Ltd.
Number of references: 16
Main heading: Two phase flow
Controlled terms: Flow measurement - Flow rate - Flowmeters - Flow velocity - Magnetization - Nuclear magnetic resonance - Magnetic susceptibility
Uncontrolled terms: Accurate measurement - Adaptive structure - Low-field NMR - Magnetization models - Simulation analysis - Water fraction
Classification code: 631 Fluid Flow - 631.1 Fluid Flow, General - 701.2 Magnetism: Basic Concepts and Phenomena - 943.1 Mechanical Instruments - 943.2 Mechanical Variables Measurements
Numerical data indexing: Percentage 0.00e+00% to 3.60e+01%, Velocity 0.00e+00m/s to 4.66e+00m/s
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283. A denoising carbon price forecasting method based on the integration of kernel independent component analysis and least squares support vector regression

Accession number: 20210509872859
Authors: E, Jianwei (1); Ye, Jimin (1); He, Lulu (1); Jin, Haihong (2)
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Corresponding author: Ye, Jimin(jmye@mail.xidian.edu.cn)
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CODEN: NRCGEO
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Abstract: During the past few decades, accurately forecasting carbon price has become a significant research field and aroused concerns from both scholars and policymakers, which contributes the Organized Exchange to scientifically and rationally allocate a fixed-quantity of carbon emissions among prospective polluters. The conventional forecasting approaches, however, suffer from the poor prediction accuracy due to the nonlinearity and non-stationarity of the carbon price series. Meanwhile, monitoring and filtering the inherent noise in carbon price series, which are the main steps in the forecasting model, are perceived as the challenging tasks to work in. To address these obstacles, a denoising-hybridization procedure, which is a hybrid model of extreme-point symmetric mode decomposition (ESMD), kernel independent component analysis (KICA) and least squares support vector regression (LSSVR), is put forward for predicting the carbon price. Firstly, the carbon price is decomposed into several intrinsic mode functions (IMFs) via the ESMD method. Secondly, independent components (ICs), which reflect the internal formation mechanism, are separated out from the IMFs via KICA method. Further, the IC comprised of the noise is eliminated according to the results of noise monitoring. Finally, the LSSVR method is applied to the remaining ICs for achieving the forecasting results of carbon price, wherein the particle swarm optimization (PSO) algorithm is employed to synchronously optimize the hyper parameters in LSSVR. The empirical results on four carbon futures prices from

European Union Emissions Trade System (EU ETS) demonstrate the effectiveness and robustness of the promoted denoising-hybridization procedure. Comparative experiments illustrate the superiority of the proposed method from the perspective of statistical performance criteria. © 2021 Elsevier B.V.
Number of references: 52
Main heading: Mode decomposition
Controlled terms: Forecasting - Functions - Least squares approximations - Carbon - Emission control - Independent component analysis - Integrated circuits - Environmental regulations - Particle swarm optimization (PSO) - International law
Uncontrolled terms: Comparative experiments - Forecasting modeling - Independent components - Intrinsic Mode functions - Kernel independent component analysis - Least squares support vector regression - Particle swarm optimization algorithm - Statistical performance
Classification code: 451.2 Air Pollution Control - 454.2 Environmental Impact and Protection - 714.2 Semiconductor Devices and Integrated Circuits - 716.1 Information Theory and Signal Processing - 723 Computer Software, Data Handling and Applications - 804 Chemical Products Generally - 921 Mathematics - 921.5 Optimization Techniques - 921.6 Numerical Methods - 971 Social Sciences
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284. Corrosion-induced CaCO3 fouling in steel tube of oilfield wastewater treatment and the interfacial bonding mechanism: An experimental and theoretical investigation

Accession number: 20211710255151
Authors: Zhang, Leilei (1); Gong, Zhaobo (1); Lin, Lili (1); Wang, Xinghua (1); Lv, Xianghong (2); Li, Jian (2); Wang, Chen (2); Kou, Di (2)
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Article number: 108759
Language: English
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Abstract: Layered scale in a steel tube sample, obtained from an oilfield wastewater pipeline in northwestern China, is experimentally examined layer by layer. From the scale layer contacting with steel wall to the center hole (from the 1st to 4th layer), the organic content increases. The majority of 1st-layer is composed with iron oxides (corrosion products), while CaCO3 emerges in the 2nd layer, and its crystal structure transforms from aragonite to calcite as scale grows thicker from the 2nd to 4th layer. Then, FeCO3 and complex carbonate (Ca0.1Mg0.33Fe0.57CO3) are identified in the 3rd and 4th layers. The experiments indicate the corrosion products preferentially form before CaCO3 fouling. So, CaCO3 precipitates are likely to nucleate on the substrate of iron oxides (such as Fe2O3), which provides a newfound impetus to explore the interfacial bonding mechanism of Fe2O3@Fe(110) and CaCO3@Fe2O3(001). By combining MD and DFT approaches, it is demonstrated that two of three O atoms in Fe2O3 molecule have formed four O–Fe bonds with Fe(110), and those bond lengths are shorter than the one in bulk Fe2O3. And, totally seven bonds would form between CaCO3 and Fe2O3(001), in which three O–Ca, one Ca–Fe and three O–Fe bonds are included. For the bonded atoms, the former atom acts as charge acceptor, and the latter tends to be donor. © 2021 Elsevier B.V.
Number of references: 48
Main heading: Calcium carbonate

Controlled terms: Calcite - Crystal structure - Hematite - Tubular steel structures - Friction - Atoms - Magnesium compounds - Steel corrosion
Uncontrolled terms: Bonding mechanism - CaCO3 fouling - Corrosion products - DFT calculation - Fe-2/O -3 - Interfacial bonding - MD simulation - Oilfield corrosion - Oilfield wastewaters - Steel tube
Classification code: 408.2 Structural Members and Shapes - 482.2 Minerals - 539.1 Metals Corrosion - 545.3 Steel - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 931.3 Atomic and Molecular Physics - 933.1.1 Crystal Lattice
Numerical data indexing: Mass 1.00E-07kg
DOI: 10.1016/j.petrol.2021.108759
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285. A simple high-sensitivity acoustic resonance detection method for metal halide lamps (*Open Access*)

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Authors: Lei, Fang (1, 2); Dupuis, Pascal (1); Durrieu, Olivier (1); Zissis, Georges (1); Maussion, Pascal (1)
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ISSN: 03878805
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Document type: Journal article (JA)
Publisher: The Illuminating Engineering Institute of Japan
Abstract: To detect acoustic resonance (AR) in metal halide (MH) lamps, a simple high-sensitivity method with a multiplier detector is presented in this paper. Voltage envelope variations are measured to evaluate whether AR occurs in MH lamps. The study is focused on improving the sensitivity of an AR detection method. Several manufacturers' MH lamps are tested in our experiment. In addition, the proposed method is compared to another voltage envelope detection method evaluating by a lock-in amplifier with high sensitivity and detection results are analyzed by statistical methods. The results show that the proposed circuit can provide similar sensitivity as the expensive lock-in amplifier to detect AR phenomena and the AR-free and the slight AR level can be easily distinguished. © 2018 The Illuminating Engineering Institute of Japan. All rights reserved.
Number of references: 16
Main heading: Sensitivity analysis
Controlled terms: Metal halide lamps - Metal halides - Locks (fasteners) - Resonance
Uncontrolled terms: Acoustic resonance - Detection methods - Envelope Detection - High sensitivity - Lock-in amplifier - Multiplier detector
Classification code: 707.2 Electric Lamps - 804 Chemical Products Generally - 921 Mathematics - 931.1 Mechanics
DOI: 10.2150/jstl.IEIJ160000598
Compendex references: YES
Open Access type(s): All Open Access, Bronze, Green
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286. Multi-objective Optimization of Turning Tool Geometric Parameters Based on Kriging Model (*Open Access*)

Accession number: 20220411535767
Authors: Sun, Jianxiang (1); Xie, Huan (1); Zeng, Wei (2); Tong, Yaoyao (3); Cai, Zhenyu (4)
Author affiliation: (1) Xijing University, Shaan Xi, Xi'an, China; (2) Xi'an Shiyou University, Shaan Xi, Xi'an, China; (3) Changchun Automobile Industry Insititute, Jilin, Changchun, China; (4) Shanghai Academy of Spaceflight Technology, Shanghai, China
Corresponding author: Sun, Jianxiang(s980322@outlook.com)
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Issue: 1
Issue title: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
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Conference name: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
Conference date: October 29, 2021 - October 31, 2021
Conference location: Xi'an, Virtual, China
Conference code: 176003
Publisher: IOP Publishing Ltd
Abstract: Cutting performance parameters of turning tool in different geometric parameters are obtained using finite element model, and the Kriging models of cutting stress and temperature are constructed, taking the cutting performance parameters as training samples. The multi-objective optimization model of turning tool geometric parameters is established based on the constructed cutting performance Kriging models, in which the design variables are rake angle, relief angle and cutting-edge radius, the objective parameters are cutting stress and temperature. The multi-island genetic algorithm is used to obtain the optimum turning tool geometric parameters: rake angle #o is 10.59°, relief angle #s is 6.15°and cutting-edge radius γ_E is 0.73mm. The simulation results after optimization demonstrate that the corresponding cutting temperature reduces 263.1cutting stress drops by 550.8MPa. © 2021 Institute of Physics Publishing. All rights reserved.
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287. Seismic data de-noising method based on VMD in time-frequency domain

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Title of translation:
Authors: Hu, Ruiqing (1); He, Junjie (1, 2); Li, Huafei (1); Zhang, Xiaoli (1); Pei, Jiading (1); Liu, Yiwei (1)
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Document type: Journal article (JA)
Publisher: Science Press
Abstract: Strong noise interference is the primary factor that causes poor imaging of deep seismic data. A new idea applies a variable mode decomposition algorithm to noise suppression. Firstly, the analytical signals of seismic data are constructed by Hilbert-Huang transform (HHT), then the seismic data are converted into time-frequency domain where time-frequency slices are decomposed as instrinsic mode functions (IMFs) by the variable mode decomposition algorithm; then the energy distribution of effective signals and noises on the time-frequency slices is analyzed, and the time-frequency slices are reconstructed by the effective IMFs; and finally the slices are transformed back to the space-time domain to achieve the goal of noise suppression. The control of key parameters on the denoising effect of the algorithm has been analyzed on model data. The results of actual data have verified that the algorithm can effectively suppress strong random noises, and it is also effective for suppressing linear noises. © 2021, Editorial Department OIL GEOPHYSICAL PROSPECTING. All right reserved.
Number of references: 27
Main heading: Mode decomposition
Controlled terms: Seismic response - Seismic waves - Hilbert-Huang transform - Geophysical prospecting - Frequency domain analysis - Spurious signal noise
Uncontrolled terms: Analytical signals - Energy distributions - Hilbert Huang transforms - Instrinsic mode functions - Mode decomposition - Noise interference - Noise suppression - Time frequency domain
Classification code: 481.4 Geophysical Prospecting - 484 Seismology - 484.2 Secondary Earthquake Effects - 716.1 Information Theory and Signal Processing - 921.3 Mathematical Transformations
DOI: 10.13810/j.cnki.issn.1000-7210.2021.02.006
Compendex references: YES
Database: Compendex
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288. Application of digital dual-phase LIA in the detection of mineral oil in water

Accession number: 20213510848011
Authors: Li, Li-Pin (1); Xu, Guo-Chao (1); Huang, Yan-Qun (2); Zhang, Peng-Li (1)
Author affiliation: (1) Xi'An Shiyou University, Shanxi Key Laboratory of Measurement and Control Technology for Oiland Gas Wells, Xi'an, China; (2) Xi'An Modern Control Technology Research Institute, Xi'an, China
Corresponding author: Li, Li-pin(lilipin@xsyu.edu.cn)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Issue date: July 23, 2021
Publication year: 2021
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Article number: 9513333
Language: English
ISBN-13: 9781665437158
Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: In order to protect the environment and save water resources, the oil content of the reinjected water from the oilfield was tested. This paper is based on the digital dual-phase lock-in amplifier (LIA) technology to realize the detection of the weak fluorescence signal emitted by the mineral oil after being stimulated. When the frequency difference between the detection frequency and the center frequency $\mathrm{f}_{\text{mod}}=125 \text{Hz}$ is 0.5 Hz, the detection data is only 2% of the center frequency at most. A standard solution with a concentration of 0 ~ 10mg / L has been prepared. The linear goodness of the fitting function between the oil concentration in water and the relative fluorescence intensity is $\mathrm{R}^{2}=99.82\%$, showing a good linear relationship, and the test error is controlled within 5.25%. And the results show that it can provide an effective basis for the quality detection of oilfield reinjection water. © 2021 IEEE.
Number of references: 9
Main heading: Water resources
Controlled terms: Signal detection - Fluorescence - Mineral oils
Uncontrolled terms: Detection frequency - Dual-phase lock-in amplifier - Fluorescence signals - Frequency differences - Linear relationships - Mineral oil in water - Relative fluorescence intensity - Standard solutions
Classification code: 444 Water Resources - 513.3 Petroleum Products - 716.1 Information Theory and Signal Processing - 741.1 Light/Optics
Numerical data indexing: Frequency 5.00e-01Hz, Mass_Density 1.00e-02kg/m3, Percentage 2.00e+00%, Percentage 5.25e+00%
DOI: 10.1109/ICMSP53480.2021.9513333
Funding Details: Number: 2020GY-169, Acronym: -, Sponsor: -; Number: 41774081, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China; Number: 20JS124, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: ACKNOWLEDGMENT The project is supported by National Natural Science Foundation of China (41774081), industrial research project of Shaanxi province(2020GY-169), key laboratory project of Shaanxi Provincial Department of Education(20JS124).
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289. Deuterium Permeation Resistance of Metal Oxide Ceramic Coatings at High Temperature

Accession number: 20211010038873
Title of translation:
Authors: Wang, Weijing (1); Liu, Xiaopeng (2); Yuan, Bifei (1); Yu, Qinghe (2); Qu, Wentao (1)
Author affiliation: (1) College of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710000, China; (2) Institute of Energy Materials and Technology, GRIMAT Engineering Institute Co. Ltd., Beijing; 101407, China
Corresponding author: Liu, Xiaopeng(xpgliu@126.com)
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Abbreviated source title: Xiyou Jinshu
Volume: 45
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Issue date: February 2021
Publication year: 2021
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Language: Chinese
ISSN: 02587076
CODEN: XIJID9
Document type: Journal article (JA)
Publisher: Editorial Office of Chinese Journal of Rare Metals
Abstract: Deuterium and tritium with tiny atomic radius, as nuclear fuel, have the extremely strong permeability, which will lead to hydrogen embrittlement and surface corrosion of the metallic structure materials. In addition, tritium has strong radioactivity and is in direct contact with the inner wall of the vessels and pipes. The high permeation rate of deuterium and tritium will lead to waste of nuclear fuel, and also cause radioactive contamination of the surroundings. The four oxide ceramic coatings were prepared on the inner wall of the structural material in order to suppress the permeation rate of hydrogen and its isotopes. The method of the radio frequency magnetron sputtering was used to prepare four single oxide ceramic coatings, namely Al2O3, Cr2O3, Y2O3 and ZrO2(8%Y2O3) on the 316L stainless steel. Then the coatings were annealed at 973 K and held for 2 h. The purpose was to improve the density of structure and the uniformity of the composition of the coatings. X-ray diffraction (XRD) and scanning electron microscope (SEM)

were used to characterize the phase composition and microstructure of the oxide ceramic coatings. In addition, the gas permeation method was used to measure the deuterium resistance of the coatings. The range of measure temperature was 973-973 K, and the range of measure permeation pressure was 40-100 kPa. By characterizing the crystalline state of the four coatings, the results showed that Al2O3 coating was amorphous, and the Cr2O3, ZrO2(8%Y2O3) and Y2O3 coatings were all crystalline structures. Cr2O3 coating was the R-3C space group (hexagonal crystal system; lattice constant a=b=0.4959 nm, c=1.3594 nm). ZrO2(8%Y2O3) coating was belonged to the P42/nmc space group (tetragonal crystal structure; lattice constants a=b=0.3629 nm, c=0.5143 nm). Y2O3 coating was the body-centered cubic with the lattice constant of a=b=c=1.0611 nm. It could be seen from SEM images that the four coatings were intensely deposited along the depth direction. ZrO2(8%Y2O3) and Y2O3 coatings grew in an equiaxed manner. However, Cr2O3 coating initially grew in an equiaxed manner, then transformed into columnar crystal growth. The thickness of Al2O3, Cr2O3, ZrO2(8%Y2O3) and Y2O3 coatings were 245, 360, 252 and 251 nm, respectively. Compared with the other three coatings, the surface of Al2O3 coating was rougher. The atomic percentage of each element in the four coatings was calculated. The results showed that the ratio of metal ions and oxygen atoms was stoichiometric, which indicated that there were no oxygen vacancies and metal phases in the four coatings. The deuterium resistance of the coating was closely related to the temperature and the permeation deuterium pressure. When the thickness of the coatings was similar, the deuterium permeability of the four coatings was 2-4 orders of magnitude lower than that of the 316L stainless steel substrate. The results indicated that the presence of the coating could effectively reduce the deuterium permeation flux. The permeation reduction factor (PRF) of Al2O3, Cr2O3, ZrO2(8%Y2O3) and Y2O3 coatings were 103, 46, 112 and 256, respectively at 973 K@80 kPa. Y2O3 coating had better deuterium resistance. The main reason was that the permeation and diffusion of deuterium in the oxide ceramic coating needed enough energy to break the chemical bond between metal ion and oxygen atom. The oxygen atoms combined with deuterium atoms to form OD-1. Subsequently, the deuterium atom broke away from original OD-1 and combined with nearby oxygen atoms to form new OD-1 under the drive of the concentration difference. The binding energy of metal ions and oxygen atoms in oxide ceramics was different, leading to differences in the energy barriers during the deuterium permeation process. In Y2O3 coating, one O2- combines with four Y3+, and the bond energy of Y-O was 714 kJ•mol-1. The release of one O2- needed to overcome the energy barrier of 2856 kJ•mol-1. Compared with the other three coatings, Y2O3 coating needed to overcome the highest energy barrier in the deuterium permeation process, so its deuterium resistance performance was the best. When the thickness of the Y2O3 ceramic coating was between 190 and 251 nm, the permeation activation energy and permeation reduction factor of the coating increased linearly. The deuterium permeation activation energy was 93-137 kJ•mol-1. The corresponding PRF was 142-256 at 973 K@80 kPa. In summary, the following conclusions could be drawn: (1) Al2O3, Cr2O3, Y2O3 and ZrO2(8%Y2O3) ceramic coatings were prepared by radio frequency magnetron sputtering method. The coating structure was dense, without obvious microscopic defects. In addition, except for non-crystalline Al2O3 coating, the other three coatings were crystalline structures. (2) When the thickness of the coating was similar, the binding energy of metal ions and oxygen atoms had an important impact on the deuterium resistance performance of the coating. The higher the binding energy, the better the deuterium permeation resistance. The comparison showed that Y2O3 coating had the best deuterium resistance among the four coatings. Its PRF was 256 at 973 K@80 kPa. Furthermore, the deuterium permeation behavior was the synergistic effect of bulk diffusion and surface diffusion. (3) The deuterium resistance performance varied with the thickness of the coating. When the thickness of Y2O3 ceramic coating was in the range of 190-251 nm, the permeation activation energy and PRF of Y2O3 coating increased linearly as the coating thickness increases. © Editorial Office of Chinese Journal of Rare Metals. All right reserved.

Number of references: 26
Main heading: Scanning electron microscopy
Controlled terms: Deuterium - Corrosion resistance - Crystalline materials - Ceramic coatings - Chromium compounds - Tritium - X ray diffraction - Ceramic materials - Permeation - Alumina - Aluminum oxide - Crystal atomic structure - Chromium alloys - Magnetron sputtering - Hydrogen - Zirconia
Uncontrolled terms: 316 L stainless steel - Crystalline structure - Oxide ceramic coating - Permeation resistance - Radio frequency magnetron sputtering - Radio frequency magnetron sputtering method - Radioactive contamination - Tetragonal crystal structure
Classification code: 539.1 Metals Corrosion - 543.1 Chromium and Alloys - 622.1.1 Radioisotopes - 801.4 Physical Chemistry - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 812.1 Ceramics - 813.2 Coating Materials - 931.3 Atomic and Molecular Physics - 933.1 Crystalline Solids - 933.1.1 Crystal Lattice
Numerical data indexing: Pressure 4.00e+04Pa to 1.00e+05Pa, Size 1.90e-07m to 2.51e-07m, Size 2.51e-07m, Size 2.52e-07m, Temperature 9.73e+02K, Time 7.20e+03s
DOI: 10.13373/j.cnki.cjrm.XY19030058
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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290. The inhibition effect of D-amino acid on the microbial corrosion of mixed bacteria

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Title of translation: D-
Authors: Xu, Congmin (1); Wang, Wenyuan (1); Liu, Li (2); Song, Pengdi (1); Gao, Haoran (1); Chen, Yueqing (1)
Author affiliation: (1) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) The Sixth Natural Gas Plant, PetroChina Changqing Oilfield Company, Jingbian; 718500, China
Source title: Natural Gas Industry
Abbreviated source title: Natur. Gas Ind.
Volume: 41
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Publication year: 2021
Pages: 160-170
Language: Chinese
ISSN: 10000976
CODEN: TIGOE3
Document type: Journal article (JA)
Publisher: Natural Gas Industry Journal Agency
Abstract: In order to better mitigate the hazards of microbial corrosion in the actual operating environment of oil and gas fields, this paper prepared mixed bacteria from sulfate reducing bacteria (SRB) and aerobic iron bacteria (IOB) cultured in the produced water of oil and gas field to explore the bactericidal enhancement effect and metal corrosion inhibition behavior of D-amino acid. The influence laws of D-tyrosine on the biofilm removal effects and bactericidal and corrosion inhibition behaviors of carbon steel in SRB+IOB medium were studied by means of weight loss experiment, electrochemical test and surface analysis. And the following research results were obtained. First, the highest corrosion inhibition rate of D-tyrosine + bactericide THPS to SRB and IOB is 73.07% and the number and depth of pitting pits are the smallest, indicating that its effect is obviously better than that added with single THPS. Second, after D-tyrosine and THPS are added, the content of phosphide and sulfide are the lowest, indicating that D-tyrosine has a significant biofilm decomposition and inhibition effect, and combined with THPS, it can kill the bacteria effectively so as to destroy the oxygen concentration difference environment and consequently mitigate the corrosion greatly. Third, the addition of D-tyrosine improves the corrosion inhibition effect and reduces the consumption of bactericide greatly. In conclusion, the research results can provide theoretical support and engineering practice guidance for microbial corrosion control under the actual working conditions of oil and gas fields. © 2021, Natural Gas Industry Journal Agency. All right reserved.
Number of references: 28
Main heading: Biofilms
Controlled terms: Corrosion inhibitors - Corrosive effects - Microbial corrosion - Steel corrosion - Oil fields - Pitting - Surface analysis - Amino acids - Gas industry - Sulfur compounds
Uncontrolled terms: Bactericidal enhancement effect - Biofilm removal - Corrosion behaviour - Corrosion inhibition - Corrosion inhibition rate - D-tyrosine - Enhancement effects - Inhibition rate - Microbial corrosion - Pittings - THPS
Classification code: 462.5 Biomaterials (including synthetics) - 512.1.1 Oil Fields - 522 Gas Fuels - 539.1 Metals Corrosion - 539.2.1 Protection Methods - 545.3 Steel - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 951 Materials Science
Numerical data indexing: Percentage 7.307E+01%
DOI: 10.3787/j.issn.1000-0976.2021.02.019
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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291. Study of massive water huff-n-puff technique in tight oil field and its field application

Accession number: 20203509106032
Authors: Qin, Guowei (1, 2); Dai, Xu (3); Sui, Lei (4); Geng, Meng (5); Sun, Linghui (5); Zheng, Yanzhao (1); Bai, Yanming (3)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Provincial Key Laboratory of Unusual Well Stimulation, Xi'an Shiyou University, Xi'an; 710065, China; (3) E&D Research Institute of Daqing Oilfield Co Ltd., Daqing; 163712, China; (4) Oil & Gas Technology Research Institute Changqing Oil Field Company, Xi'an; 710018, China; (5) PetroChina Research Institute of Petroleum E&D, Beijing; 100083, China
Corresponding author: Qin, Guowei(qgw126@126.com)

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Volume: 196
Issue date: January 2021
Publication year: 2021
Article number: 107514
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Based on the characteristics of horizontal oil wells in tight reservoirs during their late stage, which are exploited by elastic drive of natural energy and stimulated by large-scale volume fracturing; the massive water huff-n-puff technique is proposed for the use of supplementing the energy of the depleted formations, which can effectively increase the productivity of single horizontal oil well in addition to its financial benefits. In this paper, the massive water huff-n-puff technique is defined and discussed from the following aspects of the mechanism, reservoir engineering, laboratory experiments and so forth. Additionally, comprehensive analyses of the advantages of applying this technique in the development of tight oil reservoirs are provided. By the studies of the pressure composition diagram and the definition of residual injection pressure (RIP) in reservoirs, a massive water huff-n-puff mathematical model was established and the critical parameters for water-flooding were calculated. Laboratory experiments of this technique have shown that it can induce a certain number of micro-fracture networks and its application in actual oilfields also shown positive results. The pilot tests have achieved remarkable increases in productivity and economic benefits. For example, the average daily oil production from a single well is increased by 4.5 t/d (0.8 $\rightarrow$ 5.3 t/d), the formation pressure has increased by 9.3 MPa (6.9 $\rightarrow$ 16.2 MPa), accumulated oil production has reached 1,987t, and its input-output ratio has shown an enhancement in the range of 1.00:1.74–1.00:4.06. The research results of this technique provide a new way and an important model for efficient development of horizontal wells in tight oil reservoirs.
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Number of references: 33
Main heading: Horizontal wells
Controlled terms: Productivity - Well stimulation - Oil wells - Petroleum reservoir evaluation - Petroleum reservoirs - Oil field development - Reservoirs (water)
Uncontrolled terms: Comprehensive analysis - Financial benefits - Formation pressure - Injection pressures - Input-output ratio - Laboratory experiments - Pressure compositions - Reservoir engineering
Classification code: 441.2 Reservoirs - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations
Numerical data indexing: Mass_Flow_Rate 5.56e-02kg/s, Pressure 1.62e+07Pa
DOI: 10.1016/j.petrol.2020.107514
Funding Details: Number: 2019JM-108, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Provincial Department of Education; Number: 51804255, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 18JS086, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: The research was supported by the National Natural Science Foundation Projects of Shaanxi Provincial (2020JM-534 , 2019JM-108 , and 2019JQ-488), Youth Program of National Natural Science Foundation of China (51804255) and Scientific Research Program Funded by Shaanxi Provincial Education Department (18JS086).
Compendex references: YES
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Data Provider: Engineering Village
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292. Optimization of Pipe Network Simulation Algorithm for Tree-Shaped Water Injection System in Large-Scale Oilfield

Accession number: 20214811219538
Authors: Ruan, Yan (1, 2); Zhang, Xuliang (1, 2); Chen, Jiaona (1, 2)
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Corresponding authors: Ruan, Yan(1439315078@qq.com); Ruan, Yan(1439315078@qq.com)
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Abbreviated source title: Int J Pattern Recognit Artif Intell
Volume: 35
Issue: 13
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Publication year: 2021
Article number: 2159045
Language: English
ISSN: 02180014
CODEN: IJPIEI
Document type: Journal article (JA)
Publisher: World Scientific
Abstract: As intelligence technology develops, there is a higher requirement for computing speed and accuracy of water injection system simulation. In this paper, aiming at the tree-shaped water injection pipe network system of large-scale oilfields, based on the energy equation for calculating the pressure drop H of pipe section, a mathematical model of the pipeline unit and the node unit is established, and finally, a mathematical model of pipe network for the entire water injection system is established; then, the improved iterative algorithm is used to solve the simulation model of water injection system. In this way, we determine the boundary calculation conditions, take the water injection station as reference node, and use the maximum pressure of water injection well as the initial value of the reference node for calculation, which reduces the number of iterations in model calculation; by comparing the simulation results of different iteration steps, 0.01 is selected as the iteration step size due to its higher calculation accuracy; and the calculation process has also been optimized. The process of solving the characteristic matrix K is combined with the process of calculating the pressure drop H of pipe section, and placed outside the algorithm loop, thereby shortening the calculation time of a single cycle and reducing the calculation amount of the algorithm. The application cases show that the proposed optimization algorithm for water injection system pipe network simulation can be used as an effective method to improve the solution speed and calculation accuracy of the simulation algorithm of tree-shaped water injection system in large-scale oilfields. © 2021 World Scientific Publishing Company.
Number of references: 27
Main heading: Pressure drop
Controlled terms: Injection (oil wells) - Iterative methods - Trees (mathematics) - Calculations - Drops - Forestry
Uncontrolled terms: Algorithms optimizations - Calculation accuracy - Large-scales - Network simulation - Pipe networks - Reference nodes - Simulation algorithms - Solving speed - Water injection pipe network - Water injection systems
Classification code: 511.1 Oil Field Production Operations - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 921 Mathematics - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods
DOI: 10.1142/S021800142159045X
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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293. Research on the application of molecular simulation technology in enhanced oil-gas recovery engineering (*Open Access*)

Accession number: 20210609894033
Authors: Xu, Jianping (1, 2); Yuan, Yuanda (1, 2); Xie, Qing (1, 2); Wei, Xuegang (1, 2)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) MOE Engineering Research Center, Development and Management of Western Low, Ultra-Low Permeability Oilfield, Xi'an; 710065, China
Corresponding author: Yuan, Yuanda(792343379@qq.com)
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Abbreviated source title: E3S Web Conf.
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Part number: 1 of 1
Issue title: 2020 2nd International Academic Exchange Conference on Science and Technology Innovation, IAECST 2020
Issue date: January 27, 2021
Publication year: 2021
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Language: English
ISSN: 25550403
E-ISSN: 22671242
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Conference name: 2020 2nd International Academic Exchange Conference on Science and Technology Innovation, IAECST 2020
Conference date: December 18, 2020 - December 20, 2020
Conference location: Guangzhou, China
Conference code: 166777
Publisher: EDP Sciences
Abstract: In recent years, molecular simulations have received extensive attention in the study of reservoir fluid and rock properties, interactions, and related phenomena at the atomistic scale. For example, in molecular dynamics simulation, interesting properties are taken out of the time evolution analysis of atomic positions and velocities by numerical solution of Newtonian equations for all atomic motion in the system. These technologies assists conducting "computer experiments" that might instead of be impossible, very costly, or even extremely perilous to carry out. Whether it is from the primary oil recovery to the tertiary oil recovery or from laboratory experiment to field test, it is difficult to clarify the oil displacement flow mechanism of underground reservoirs. Computer molecular simulation reveals the seepage mechanism of a certain oil displacement at the microscopic scale, and enriches the specific oil displacement flow theory system. And the molecular design and effect prediction of a certain oil-displacing agent were studied, and its role in the reservoir was simulated, and the most suitable oil-displacing agent and the best molecular structure of the most suitable oil-displacing agent were obtained. To give a theoretical basic for the development of oilfield flooding technology and enhanced oil/gas recovery. This paper presents an overview of molecular simulation techniques and its applications to explore enhanced oil/gas recovery engineering research, which will provide useful instructions for characterizing the reservoir fluid and rock and their behaviors in various oil-gas reserves, and it greatly contribute to perform optimal operation and better design of production plants. © 2021 EDP Sciences. All rights reserved.
Number of references: 65
Main heading: Molecular dynamics
Controlled terms: Petroleum reservoirs - Proven reserves - Enhanced recovery - Gas plants - Petroleum reservoir engineering - Molecular structure
Uncontrolled terms: Computer experiment - Laboratory experiments - Molecular dynamics simulations - Molecular simulations - Newtonian equations - Numerical solution - Tertiary oil recovery - Time-evolution analysis
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 522 Gas Fuels - 801.4 Physical Chemistry - 931.3 Atomic and Molecular Physics
DOI: 10.1051/e3sconf/202123301124
Funding Details: Number: 51874241, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Open Access type(s): All Open Access, Gold, Green
Database: Compendex
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294. An improved extension neural network methodology for fault diagnosis of complex electromechanical system (*Open Access*)

Accession number: 20220311476810
Authors: Zhou, Yunfei (1); Sai, Yunxiu (2); Yan, Li (3)
Author affiliation: (1) School of Management, Xi'an University of Finance and Economics, Xi'an; 710100, China; (2) Xi'an Shiyou University, Xi'an; 710065, China; (3) Xi'an Technological University, Xi'an; 710021, China
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Source title: International Journal of Bio-Inspired Computation
Abbreviated source title: Int. J. Bio-Inspired Comput.
Volume: 18
Issue: 4
Issue date: 2021
Publication year: 2021
Pages: 250-258
Language: English
ISSN: 17580366
E-ISSN: 17580374
Document type: Journal article (JA)
Publisher: Inderscience Publishers

Abstract: Fault diagnosis of complex electromechanical system is always a complex and challenging problem. The method of how to identify, extract and classify fault features is still a key problem. Towards the end, this study proposes an intelligent fault diagnosis method based on extension neural network and uniform distribution search for particle swarm optimisation algorithm. Specifically, the influence of joint field on the classical domain is considered in the training dataset and the improved particle swarm optimisation algorithm is used to optimise the classical domain. Subsequently, the improved extended distance is used for classification training. The simulation results of turbine generator set prove that the method cannot only correctly extract the available classical domain features from the collected training dataset, but also has higher diagnostic accuracy and fast training process. © 2021 Inderscience Publishers. All rights reserved.
Number of references: 30
Main heading: Failure analysis
Controlled terms: Fault detection - Complex networks - Particle swarm optimization (PSO) - Neural networks
Uncontrolled terms: CES - Complex electromechanical systems - ENN - Extension neural networks - Fault feature - Faults diagnosis - Intelligent fault diagnosis - Network methodologies - PSO - Training dataset
Classification code: 722 Computer Systems and Equipment - 723 Computer Software, Data Handling and Applications - 921.5 Optimization Techniques
DOI: 10.1504/IJBIC.2021.119982
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Funding text: This work was supported by National Natural Science Foundation of China under Grants 61925602 and 61732011.
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Open Access type(s): All Open Access, Green
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Data Provider: Engineering Village
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295. A Nanoparticle Adsorption-Based Salt-Resistant Foam for Gas Well Deliquification

Accession number: 20203609142763
Authors: Wang, Yang (1, 2); Yang, Jiang (1, 2)
Author affiliation: (1) Xi'an Shiyou University, No. 18, Dianzi 2 Road, Yanta district, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoir, No. 18, Dianzi 2 Road, Yanta district, Xi'an; 710065, China
Corresponding authors: Wang, Yang(ywang@xsyu.edu.cn); Wang, Yang(ywang@xsyu.edu.cn)
Source title: Journal of Surfactants and Detergents
Abbreviated source title: J. Surfactants Deterg.
Volume: 24
Issue: 1
Issue date: January 2021
Publication year: 2021
Pages: 67-74
Language: English
ISSN: 10973958
E-ISSN: 15589293
CODEN: JSDEFL
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: With the continuous development of gas fields, water production problems are seriously affecting production rates. Aiming at the problem of the high production rates of mineralized formation water in China's gas fields, we investigate the feasibility of a foam for gas well deliquification process using a combination of nanoparticles and surfactants. Through the combination of anionic and non-ionic surfactants, a system with better foam stability is optimized by the hand-shock method. Based on the formation of hydrogen bonds between the fatty alcohol polyoxyethylene ether and SiO2 nanoparticles, the fatty alcohol polyoxyethylene ether created hydrophobicity after silica was added. Adsorbed on the gas–liquid interface, the dilatational modulus of the gas–liquid interface increased, the shift time extended, and the diameter of the generated foam is smaller, that is, a unit volume of gas can carry more liquid. Foam stability can be adjusted by altering the pH value of the foam for gas well deliquification. Last, the oil resistance of the system was improved by adding fatty alcohols. Here, a foam for gas well deliquification was established by the combination of surfactant, nanoparticles, and fatty alcohols, which has good foaming performance, stability, and oil resistance. © 2020 AOCS
Number of references: 25

Main heading: Gases
Controlled terms: Liquids - Molecular dynamics - Silica nanoparticles - Surface active agents - Gas industry - Hydrogen bonds - Natural gas wells - Gasoline - Polyethylene oxides - Polyvinyl alcohols - Silicones - Ethers - Natural gas well production - Phase interfaces - SiO2 nanoparticles
Uncontrolled terms: Continuous development - Dilatational modulus - High production rate - Liquid interface - Nanoparticle adsorptions - Polyoxyethylene ether - Production rates - Water production
Classification code: 512.2.1 Natural Gas Fields - 522 Gas Fuels - 523 Liquid Fuels - 761 Nanotechnology - 801.4 Physical Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 815.1.1 Organic Polymers
DOI: 10.1002/jsde.12459
Funding Details: Number: PLC20190801, Acronym: -, Sponsor: -; Number: 19JK0664, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2019JM#269, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: YCS18111002, Acronym: -, Sponsor: -; Number: 51934005, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This study was funded by the State Key Laboratory Open Fund of Chengdu University of Technology (PLC20190801), Shaanxi Natural Science Foundation (2019JM269), Project of Shaanxi Education Department (19JK0664), Xi'an Shiyou University Graduate Innovation and Practice Ability Development Program Funding (YCS18111002), and National Natural Science Foundation of China (51934005).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

296. Environmental effect, price subsidy and financial performance: Evidence from Chinese new energy enterprises

Accession number: 20204909567800
Authors: Cui, Yu (1); Khan, Sufyan Ullah (1, 2); Li, Zhixue (3); Zhao, Minjuan (1)
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Corresponding author: Zhao, Minjuan(minjuan.zhao@nwsuaf.edu.cn)
Source title: Energy Policy
Abbreviated source title: Energy Policy
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Publication year: 2021
Article number: 112050
Language: English
ISSN: 03014215
CODEN: ENPYAC
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Owing to the advantages of resources conservation and environmental improvement, the new energy industry has become a strategic emerging industry all over the world, and the majority of countries have formulated different kinds of subsidies policies to new energy enterprises. Therefore, environmental effects and price subsidies become important influencing factors on financial performance. Based on 185 samples from 37 new energy listed companies in China from 2011 to 2015, combining with the sequential regression test program, the current study systematically discusses the relationship between environmental effect and financial performance, as well as the mediating effect of price subsidy. The result shows that, the environmental effects have a significant positive impact on the financial performance in the current and the lag period. Meanwhile, price subsidy implemented by government improved the financial performance in the current and the lagging period, while it only positively impacts the lagging period environmental effect. Besides, both current and the lagging period of price subsidy plays a significant positive mediating effect role in the relationship between environmental effect and financial performance. Moreover, the marketing degree and enterprises' age stimulate the mediating effect of price subsidy, while the enterprises' size and owners' equity characteristics inhibit the mediating effect. © 2020 Elsevier Ltd
Number of references: 92
Main heading: Environmental impact
Controlled terms: Software testing - Finance

Uncontrolled terms: Environmental improvements - Financial performance - Mediating effect - New energies - New energy enterprise - New energy industries - Price subsidies - Regression tests
Classification code: 454.2 Environmental Impact and Protection - 723.5 Computer Applications
DOI: 10.1016/j.enpol.2020.112050
Funding Details: Number: 2019XY012, Acronym: -, Sponsor: -; Number: Z221021601, Acronym: -, Sponsor: -; Number: 15ZDA052, Acronym: -, Sponsor: -; Number: JGYJSCXXM202001, Acronym: -, Sponsor: -; Number: -, Acronym: MOA, Sponsor: Ministry of Agriculture of the People's Republic of China; Number: CARS-07-F-1, Acronym: MOF, Sponsor: Ministry of Finance; Number: 2019131039, Acronym: NFGA, Sponsor: National Forestry and Grassland Administration;
Funding text: The Major Project of the National Social Science Foundation of China (No. 15ZDA052), National Soft Science Project of State Forestry and Grassland Administration (No. 2019131039), the Key Special Funds of Ministry of Agriculture and Ministry of Finance (Grant No. CARS-07-F-1) and the Key Project of Six Industrial Research Institutes of Northwest Agricultural and Forestry University (Grant No. Z221021601) supported this research. Major Research Project of County Economy in Shaanxi Province (No. 2019XY012) and Scientific Research and Innovation Projects of Northwest A&F University (No. JGYJSCXXM202001) also supported this study.
Compendex references: YES
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297. High-voltage AlInN/GaN superjunction fin-gate high electron mobility transistor for power-switching application (*Open Access*)

Accession number: 20211210101866
Authors: Zhou, Weijun (1); Ye, Qing (1); Dai, Junyu (1); Guo, Tianyu (1); Zhang, Jinqiu (1); Li, Zheng (1); Wu, You (1); Zhao, Ziyu (2); Zhao, Ziqi (1, 3); Wei, Zhiheng (1)
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Corresponding author: Zhao, Ziqi(zhaoziqi@nbu.edu.cn)
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Issue: 6
Issue date: 27 May 2021
Publication year: 2021
Pages: 363-367
Language: English
E-ISSN: 17500443
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: An AlInN/GaN superjunction fin-gate high electron mobility transistor (SJFin-HEMT) is proposed in this work. A superjunction region with GaN/AlInN/GaN/AlInN/GaN structure is defined between the gate and drain, and two-dimensional-hole-gas/two-dimensional-electron-gas/two-dimensional-hole-gas/two-dimensional-electron-gas (2DHG/2DEG/2DHG/2DEG) are respectively induced due to the polarization charges at the heterojunction interfaces. The 2DHGs and 2DEGs compensate each other, resulting a charge balanced superjunction in the gate-drain spacing, thus inducing a uniform electric field distribution under off-state maximizing the breakdown voltage. Additionally, because the current flows through both the 2DEGs, higher output current and lower on-state resistance are observed in contrast to the conventional Fin-HEMT. Simulation results show breakdown voltage of 2957 V (VGS= –6 V) and on-state resistance of 0.31 m#·cm2 (VDS= 0.1 V, VGS= 0 V) for the SJFin-HEMT, comparing with that of 241 V and 0.36 m#·cm2 for the conventional Fin-HEMT. © 2021 The Authors. Micro & Nano Letters published by John Wiley & Sons Ltd on behalf of The Institution of Engineering and Technology
Number of references: 24
Main heading: High electron mobility transistors
Controlled terms: III-V semiconductors - Electric breakdown - Heterojunctions - Fins (heat exchange) - Heterojunction bipolar transistors - Gallium nitride - Two dimensional electron gas - Electron mobility - Phase interfaces
Uncontrolled terms: Heterojunction interfaces - On-state resistance - Output current - Polarization charges - Power switching applications - Superjunctions - Two-dimensional hole gas - Uniform electric fields

Classification code: 616.1 Heat Exchange Equipment and Components - 701.1 Electricity: Basic Concepts and Phenomena - 712.1 Semiconducting Materials - 714.2 Semiconductor Devices and Integrated Circuits - 801.4 Physical Chemistry
Numerical data indexing: Voltage 2.41e+02V, Voltage 2.96e+03V
DOI: 10.1049/mna2.12059
Funding Details: Number: 202003N4098, Acronym: -, Sponsor: Natural Science Foundation of Ningbo; Number: 11747088, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Ningbo University; Number: IOSKL2017KF06, Acronym: SKLIOE, Sponsor: State Key Laboratory on Integrated Optoelectronics;
Funding text: This work is supported by National Natural Science Foundation of China (11747088), Natural Science Foundation of Ningbo (202003N4098), Open Fund of the State Key Laboratory of Integrated Optoelectronics (IOSKL2017KF06) and K. C. Wong Magna Fund in Ningbo University.
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Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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298. Research on Adaptive Reclosing of Distribution Network based on Signal Injection

Accession number: 20214010976525
Authors: Wu, Xiaomeng (1, 2); Zhang, Tao (1)
Author affiliation: (1) Xi'An Shiyou University, School of Electric Engineering, China; (2) Key Laboratory of Measurement and Control Technique of Oil and Gas Wells of Shaanxi Province xi'An, China
Source title: IMCEC 2021 - IEEE 4th Advanced Information Management, Communicates, Electronic and Automation Control Conference
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Part number: 1 of 1
Issue title: IMCEC 2021 - IEEE 4th Advanced Information Management, Communicates, Electronic and Automation Control Conference
Issue date: June 18, 2021
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Language: English
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Conference name: 4th IEEE Advanced Information Management, Communicates, Electronic and Automation Control Conference, IMCEC 2021
Conference date: June 18, 2021 - June 20, 2021
Conference location: Chongqing, China
Conference code: 170540
Sponsor: Chengdu Union Institute of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Global Union Academy of Science and Technology; IEEE Beijing Section
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Without discriminating the nature of faults, the traditional three-phase reclosing performs after set time, so the failure of reclosing will result in a secondary impact on the system. In order to avoid the damage of secondary impact caused by reclosing onto a permanent fault and increase the successful rate of reclosing, the application of adaptive reclosing technology for transmission lines has been relatively common, and the development of adaptive reclosing technology for distribution lines has been relatively slow. The adaptive reclosing technology of distribution network based on signal injection is studied in this paper. Compared with the fault nature identification method based on the electrical characteristics of the fault itself, the scheme of adaptive reclosing technology based on additional injection of trial signal in the primary system has the advantage of not being limited by the structure and parameter characteristics of the distribution line itself, which can fundamentally overcome the difficulties faced by the fault property identification method based on the electrical characteristics or arc characteristics of the line fault recovery stage. © 2021 IEEE.
Number of references: 10
Uncontrolled terms: Adaptive reclosing - Distribution lines - Electrical characteristic - Fault nature identification - Identification method - Nature of faults - Network-based - Reclosing - Secondary impacts - Signal injection

DOI: 10.1109/IMCEC51613.2021.9481994
Funding Details: Number: 2021JM-404, Acronym: -, Sponsor: -; Number: YCS20141002, Acronym: -, Sponsor: -;
Funding text: ACKNOWLEDGMENT This paper is supported by Shaanxi Province Science and Technology Plan Basic Research Project (2021JM-404) and Xi'an Shiyou University Graduate Innovation and Practice Ability Training Project (YCS20141002).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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299. Research on a micro-expression recognition algorithm based on 3D-CNN

Accession number: 20213510848028
Authors: Jiao, Yao (1, 2); Jing, Mingli (1, 2); Hu, Yuliang (1, 2); Sun, Kun (1, 2)
Author affiliation: (1) Xi'An Shiyou University, School of Electrical Engineering, Xi'an, China; (2) Shaanxi Provincial Key Lab of Oil and Gas Well Measurement and Control Technology, Xi'an, China
Corresponding author: Jing, Mingli(jml506@yeah.net)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Article number: 9513351
Language: English
ISBN-13: 9781665437158
Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Micro expression is a kind of natural human expression, which lasts for a short time and is not easy to detect. Due to the subtle spatiotemporal variation of micro-expressions, the recognition of micro-expressions is still a big challenge. Although many scholars have made some attempts in the recognition of micro-expressions, the accuracy of the recognition problem is still not ideal. In order to take advantage of 3D convolution, we propose an improved model of micro expression recognition based on 3D convolution neural network (3D-CNN). In the sequential model based on the deep learning framework of Keras, 3D convolution, pooling, batch normalization and other layers are added to construct the sequence. The recognition rate of this model on SMIC database can reach 76.92%, and it also shows good recognition rate on other databases. This method is superior to or partially superior to the classical methods and the current mainstream methods. © 2021 IEEE.
Number of references: 27
Main heading: Convolution
Controlled terms: 3D modeling - Deep learning
Uncontrolled terms: Classical methods - Convolution neural network - Learning frameworks - Micro-expressions - Sequential model - Spatio-temporal variation
Classification code: 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing
Numerical data indexing: Percentage 7.69e+01%
DOI: 10.1109/ICMSP53480.2021.9513351
Funding Details: Number: ycs20113038, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

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300. Research on Location and Capacity of Distribution Generation Considering Plug-in Electric Vehicle

Accession number: 20214010976442
Authors: Wu, Xiaomeng (1, 2); Yuan, Rongze (1)
Author affiliation: (1) Xi'An Shiyou University, School of Electric Engineering, China; (2) Key Laboratory of Measurement and Control Technique of Oil and Gas Wells of Shaanxi Province xi'An, China
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Abbreviated source title: IMCEC - IEEE Adv. Inf. Manag., Commun., Electron. Autom. Control Conf.
Part number: 1 of 1
Issue title: IMCEC 2021 - IEEE 4th Advanced Information Management, Communicates, Electronic and Automation Control Conference
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Conference name: 4th IEEE Advanced Information Management, Communicates, Electronic and Automation Control Conference, IMCEC 2021
Conference date: June 18, 2021 - June 20, 2021
Conference location: Chongqing, China
Conference code: 170540
Sponsor: Chengdu Union Institute of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Global Union Academy of Science and Technology; IEEE Beijing Section
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: As distribution generation (DG) are more and more widely used in power system, the importance of their siting and sizing issues has been also become prominent. If the location and capacity of the DG are not properly selected, it may have a negative impact on the protection configuration, nodal voltage distribution and energy loss of the power distribution network. This paper is based on the background of distribution generation and a large number of plug-in electric vehicles (PEV) are connected to the grid, established a probability distribution model for DG and PEV, then determined the objective function considering cost and power quality, summarized the corresponding siting and sizing methods. © 2021 IEEE.
Number of references: 5
Main heading: Probability distributions
Controlled terms: Plug-in electric vehicles - Electric power transmission networks - Energy dissipation
Uncontrolled terms: As distribution - Distribution generation - Distribution networks planning - Nodal voltage - Power - Power distribution network - Probability distribution model - Protection configurations - Siting and sizings - Voltage distribution
Classification code: 525.4 Energy Losses (industrial and residential) - 702.1.2 Secondary Batteries - 706.1.1 Electric Power Transmission - 922.1 Probability Theory
DOI: 10.1109/IMCEC51613.2021.9482062
Funding Details: Number: 2021JM-404, Acronym: -, Sponsor: -; Number: YCS20141008, Acronym: -, Sponsor: -; Number: -, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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301. Comparison of abrasive jet erosion behavior in water and non-newtonian hydroxypropylguar gum solution

Accession number: 20212510545262
Authors: Wang, Zhi-Guo (1); Qu, Hang (1); Dou, Yi-Hua (1); Wang, Wen-Juan (1); Cao, Kai (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Dou, Yi-Hua(yhdou@vip.sina.com)
Source title: Surface Technology
Abbreviated source title: Surf. Technol.
Volume: 50
Issue: 5
Issue date: 2021
Publication year: 2021
Pages: 160-167
Article number: 1001-3660(2021)05-0160-08
Language: Chinese
E-ISSN: 10013660
Document type: Journal article (JA)
Publisher: Chongqing Wujiu Periodicals Press
Abstract: This paper aims to analyze the difference between the particle motion in water and the non-Newtonian hydroxypropylguar gum solution in abrasive jet, reveals the near-wall erosion behavior of abrasive jet particles in non-Newtonian fluid, and provides the basis for the establishment of erosion model in non-Newtonian fluid. The computational fluid dynamics (CFD) method was utilized to study the flow field characteristics of water and hydroxypropylguar gum solution in the process of abrasive jet, and the differences in particle motion characteristics caused by this were analyzed, including the impact number, impact velocity and impact angle of particles on the wall. Combined with jet erosion tests, the experimental data was compared with the prediction results of different erosion models to select the most suitable prediction model. The results show that the turbulent kinetic energy of hydroxypropylguar gum solution near the wall (150 μm off from the wall) was higher than that of water, and the flow velocity near the wall was lower than that of water. In the high shear rate region near the wall, the viscosity of hydroxypropylguar gum solution dropped to 3.54 mPa·s due to shear dilution, while the maximum viscosity reached to 25.4 mPa·s in the region far away from the jet impact center. Compared with water, in the central area of the jet impact, the number of particles in the hydroxypropylguar gum solution hitting the wall of the material was less, and the impact velocity and angle were smaller. The erosion prediction results of DNV, Oka and E/CRC Zhang models were compared with the results of erosion tests of particles in hydroxypropylguar gum solution. DNV model did not predict the erosion sufficiently, while both the Oka and E/CRC Zhang model over-predicted the erosion. The prediction result of the Zhang model is closest to the experimental data. The shear thinning non-Newtonian rheology of fluid could affect the particle movement in the jet process, resulting in different material surface erosion morphologies. By comparing the predicted values of different erosion models, it is shown that within the range of the experimental conditions and the selected erosion model in this study, E/CRC Zhang model is the preferred erosion prediction model for studying the erosion of solid particles in non-Newtonian Hydroxypropylguar gum solution. © 2021, Chongqing Wujiu Periodicals Press. All rights reserved.
Number of references: 38
Main heading: Erosion
Controlled terms: Shear thinning - Kinetics - Computational fluid dynamics - Flow velocity - Shear flow - Forecasting - Non Newtonian flow - Rheology - Viscous flow - Kinetic energy - Flow measurement - Non Newtonian liquids
Uncontrolled terms: Computational fluid dynamics methods - Erosion predictions - Experimental conditions - Flow field characteristics - Non-Newtonian fluids - Non-Newtonian rheology - Particle movement - Turbulent kinetic energy
Classification code: 631 Fluid Flow - 631.1 Fluid Flow, General - 723.5 Computer Applications - 931 Classical Physics; Quantum Theory; Relativity - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids - 943.2 Mechanical Variables Measurements
Numerical data indexing: Size 1.50e-04m
DOI: 10.16490/j.cnki.issn.1001-3660.2021.05.017
Funding Details: Number: 52074220, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JM-268, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province; Number: YCS19213114, Acronym: -, Sponsor: -;
Funding text: 2020-03-162020-06-15 Received2020-03-16Revised2020-06-15 (52074220)(2019JM-268) (YCS19213114) FundSupported by National Natural Science Foundation of China (52074220), Basic Research Program of Natural Science of Shaanxi Province (2019JM-268), Postgraduate Innovation and Practical Ability Training Plan of Xi'an Shiyou University (YCS19213114) 1977— BiographyWANG Zhi-guo (1977—), Male, Doctor, Associate professor, Research focus: erosion theory and application of multiphase complex fluid. 1964—yhdou@vip.sina.com Corresponding authorDOU Yi-hua (1964—), Male, Doctor, Professor, Research focus: completion and safety

evaluation technology for high temperature and high pressure oil and gas wells. E-mail: yhdou@vip.sina.com , , , . [J]. , 2021, 50(5): 160-167. WANG Zhi-guo, QU Hang, DOU Yi-hua, et al. Comparison of abrasive jet erosion behavior in water and non-Newtonian hydroxypropylguar gum solution[J]. Surface technology, 2021, 50(5): 160-167.
Compendex references: YES
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Data Provider: Engineering Village
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302. Study on vibration characteristics of guiding shaft of new directional rotary steering drilling tool

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Title of translation:
Authors: Zhang, Guangwei (1); Hou, Pengpeng (1); Li, Junqiang (1); Ma, Jianqing (1)
Author affiliation: (1) College of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
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Abbreviated source title: Meitan Kexue Jishu
Volume: 49
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Publication year: 2021
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Language: Chinese
ISSN: 02532336
CODEN: CSTPDL
Document type: Journal article (JA)
Publisher: China Coal Society
Abstract: Steering shaft is a key component of directional rotary steering drilling tool to achieve steering drilling. When drilling, the steering shaft is subject to complex forces and is prone to vibration, which affects the steering stability, accuracy and reliability of the rotary steering drilling tool, thus affecting borehole trajectory control, wellbore quality and drilling efficiency. In this paper, the steering shaft was taken as the research object. The steering driving force of eccentric ring group, the torque of rotating jacket and the lateral force of stratum rock were analyzed and the mechanical model of the steering shaft was established to analyze the load. Based on the dynamic theory and finite element method, the modal analysis and harmonic response analysis of the longitudinal and transverse vibration of the guide shaft were carried out. The influence of the yaw angle of the guide shaft on the natural frequency of the guide shaft and the influence of the torque, the drilling pressure and the yaw angle of the guide shaft on the vibration characteristics of the guide shaft were discussed. The results show that when the yaw angle of the guide shaft increases from 0 to 6 degrees, the natural frequency of the transverse vibration increases significantly. Lateral vibration is the main vibration form of the guide shaft. The transverse amplitude of the connection between the guide shaft and the eccentric ring group is larger at the distance of 0.52 m from the guide joint. The torque and weight-on-bit have a greater impact on the longitudinal vibration of the guide shaft. As the torque increases from 1 000 N·m to 1 600 N·m, the longitudinal amplitude of the guide shaft increases by about 1.3 times. The research results provide theoretical references for the design of structural parameters of guide shaft, the improvement of guidance stability and accuracy, and well trajectory control. © 2021 Meitan Kexun Jishu/Coal Science and Technology (Peking). All rights reserve.
Number of references: 19
Main heading: Natural frequencies
Controlled terms: Boreholes - Infill drilling - Modal analysis - Quality control - Torque - Vibration analysis
Uncontrolled terms: Drilling tool - Eccentric ring - Guide shafts - Rotary steering drilling tools - Steering drilling tool - Steering shaft - Trajectory control - Vibration characteristics - Vibration modes - Yaw angles
Classification code: 511.1 Oil Field Production Operations - 913.3 Quality Assurance and Control - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Size 5.20E-01m, Torque 0.00E00N.m to 1.00E00N.m, Torque 6.00E+02N.m
DOI: 10.13199/j.cnki.cst.2021.10.024
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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303. Study on Synthesis Method of Multipoint Seismic Waves for Buried Oil and Gas Pipeline in Shaking Table Tests (*Open Access*)

Accession number: 20213410799011
Authors: Dai, Jian-Bo (1); Zhang, Gui-Di (1); Hu, Cheng-Tao (1); Cheng, Kai-Kai (1)
Author affiliation: (1) Collage of Mechanical Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Dai, Jian-Bo(184298843@qq.com)
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Abbreviated source title: Shock Vib
Volume: 2021
Issue date: 2021
Publication year: 2021
Article number: 4624871
Language: English
ISSN: 10709622
CODEN: SHVIE8
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: The buried oil and gas pipeline is a linear structure with infinite length. In the shaking table test of its seismic response, it is necessary to input the spatially related multipoint seismic wave considering the propagation characteristics of ground motion. The multipoint seismic excitation shaking table tests and loading scheme of buried oil and gas pipelines are designed and formulated. The synthesis method of spatial correlation multipoint seismic wave for the buried oil and gas pipeline test is proposed in this study. The values of relevant parameters are analyzed, and corresponding program is compiled by MATLAB. The results show that the developed multipoint excitation shaking table seismic wave input scheme is reasonable. At the same time, the synthesized multipoint seismic wave based on the actual seismic record and artificial random simulation seismic wave can meet the test requirements, which suggests the testing effect is good. © 2021 Jian-Bo Dai et al.
Number of references: 16
Main heading: Seismic waves
Controlled terms: MATLAB - Gases - Seismology - Testing
Uncontrolled terms: Linear structures - Multi-point excitation - Oil-and-Gas pipelines - Propagation characteristics - Seismic excitations - Seismic wave input - Shaking table tests - Spatial correlations
Classification code: 484 Seismology - 484.1 Earthquake Measurements and Analysis - 723.5 Computer Applications - 921 Mathematics
DOI: 10.1155/2021/4624871
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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304. Intelligent Human Body Posture Recognition and Its Comparative Study

Accession number: 20212110398104
Authors: Wang, Zheng (1); Zhang, Long-Fei (1); Feng, Xiao-Xing (1); Liu, Meng-Xi (1)
Author affiliation: (1) College of Electronic Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Zheng(satellite_orbit210@163.com)
Source title: Journal of Physics: Conference Series
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Part number: 1 of 1
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Publication year: 2021
Article number: 012053
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020

Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: An algorithm of activity pattern recognition based on fuzzy mathematics used the excellent characteristics and the classification ability of multiple classifier for human pasture identification is analyzed and compared. Time-domain analysis is used as the only method through large amounts of data, and corresponding BP neural network and Support vector machine (SVM) was established were compared with the algorithm of fuzzy mathematics, and some method were evaluated at last. The results showed that the algorithm based on fuzzy mathematics had a good performance and value. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Time domain analysis
Controlled terms: Support vector machines - Neural networks - Pattern recognition
Uncontrolled terms: Activity patterns - Algorithm of fuzzy - BP neural networks - Classification ability - Comparative studies - Human body postures - Large amounts of data - Multiple classifiers
Classification code: 723 Computer Software, Data Handling and Applications - 921 Mathematics
DOI: 10.1088/1742-6596/1894/1/012053
Funding Details: Number: 2020JQ-788, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: The work is partly supported by the natural science foundation of Shaanxi Province (2020JQ-788). Supported by the Natural Science Foundation of Shaanxi Province, China (2020JQ-788)
Compendex references: YES
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305. Design and mechanical behavior analysis of clamping device of carbon fiber sucker rod working vehicle (*Open Access*)

Accession number: 20211010019377
Authors: Yan, Wenhui (1); Xie, Dong (1); Li, Jie (1); Yuan, Hengtong (1); Peng, Yong (1)
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Corresponding author: Yan, Wenhui(ywh369@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
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Issue: 1
Issue title: 3rd International Conference on Mechanical, Electrical and Material Application, MEMA 2020
Issue date: January 15, 2021
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Article number: 012057
Language: English
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Document type: Conference article (CA)
Conference name: 2020 3rd International Conference on Mechanical, Electrical and Material Application, MEMA 2020
Conference date: November 6, 2020 - November 8, 2020
Conference location: Chongqing, China
Conference code: 167334
Publisher: IOP Publishing Ltd
Abstract: This paper optimizes the design of the clamping device of the carbon fiber sucker rod operating vehicle, aiming to improve the shearing problem when the carbon fiber sucker rod enters the clamping device. The structure of the clamping device is designed; Finite element software was used to simulate the state of the clamping device during actual work, the maximum displacement position of the carbon fiber sucker rod and the stress change curve of the sucker rod in the clamping device are obtained; Reasonably adjust the load distribution of the hydraulic cylinder according to the stress change curve of the sucker rod in the clamping device, so that the sucker rod in the clamping device bears a reasonable stress change, which is beneficial to reduce the shear of the sucker rod just entering the clamping device effect. The analysis shows that in the clamping device, the stress of the sucker rod is the largest when it just enters the clamping device. The load of the three hydraulic cylinders of the moving rail gradually increases from bottom to top, which can make the sucker rod bear the force uniformly and can improve the shear problem when the sucker rod just enters the guide rail. © Published under licence by IOP Publishing Ltd.

Number of references: 8
Main heading: Carbon fibers
Controlled terms: Shear flow - Clamping devices - Manufacture - Mechanical actuators - Cylinders (shapes)
Uncontrolled terms: Finite element software - Guide rail - Hydraulic cylinders - Load distributions - Maximum displacement - Mechanical behavior - Shear problems - Stress changes
Classification code: 537.1 Heat Treatment Processes - 631.1 Fluid Flow, General - 732.1 Control Equipment - 804 Chemical Products Generally - 913.4 Manufacturing
DOI: 10.1088/1742-6596/1750/1/012057
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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306. Research on Weld Defect Identification with X-ray Based on Convolutional Neural Network (*Open Access*)

Accession number: 20212110398122
Authors: Zhang, Long-Fei (1); Gao, Wei-Xin (1); Wang, Zheng (1); Wu, Xiao-Meng (1)
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
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Language: English
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In the process of X-ray weld defect detection, a deep learning network structure based on the principle of simulated visual perception is constructed. The size and number of layers of convolutional neural network template, and the influence of different activation functions, are analyzed with an improved method proposed, which may avoid the characteristic steps for the extraction of defect images, and can be used to directly determine the presence of any defect. Experiments on 200 images show that the proposed method for SDR images has an identification rate of more than 98%, which is better than other methods, and has highly practically in pipeline defect detection. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Image enhancement
Controlled terms: Convolutional neural networks - Welds - Deep learning - Defects - Multilayer neural networks - Convolution
Uncontrolled terms: Activation functions - Defect images - Identification rates - Learning network - Number of layers - Pipeline defect detection - Visual perception - Weld defect detection
Classification code: 461.4 Ergonomics and Human Factors Engineering - 538.2 Welding - 716.1 Information Theory and Signal Processing - 951 Materials Science
Numerical data indexing: Percentage 9.80e+01%
DOI: 10.1088/1742-6596/1894/1/012071
Funding Details: Number: 18JS094, Acronym: -, Sponsor: -; Number: 2020GY-179, Acronym: -, Sponsor: -; Number: YCS19213104, Acronym: -, Sponsor: -;

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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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307. Design and implementation of embedded design-based PCP water injection system

Accession number: 20211910343286
Authors: Liu, Huan (1); Liu, Feng (1)
Author affiliation: (1) Xi'an Shiyou University, Xsyu, School of Electronic Engineering, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: PCP, the pump-controlled pumping technology, can improve the efficiency of water injection system and reduce energy consumption. The PCP water injection system, which is compact in size due to embedded design, consists of a lower machine with PLC and an upper computer with configuration software installed. The lower machine collects and processes the signals from the sensors, and then uploads them to the upper computer, while the MCGS configuration software in the upper computer mainly monitors, displays and stores the on-site parameters of water injection equipment and production parameters, whose main task is to automatically adjust the operating parameters of the small pump according to the parameters to ensure the optimal operation of the system. The field data shows that this system can automatically make the injection pump work in the best efficiency section, reducing the labor intensity of staff and improving the efficiency of water injection, compared with the previous one. © 2021 IEEE.
Number of references: 11
Main heading: Energy utilization
Controlled terms: Display devices - Embedded systems - Pumps - Energy efficiency - Computer operating systems
Uncontrolled terms: Configuration software - Design and implementations - Injection equipment - Operating parameters - Optimal operation - Production parameters - Reduce energy consumption - Water injection systems
Classification code: 525.2 Energy Conservation - 525.3 Energy Utilization - 618.2 Pumps - 722.2 Computer Peripheral Equipment
DOI: 10.1109/ICSP51882.2021.9408787
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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308. Research on Community Consumer Behavior Based on Association Rules Analysis

Accession number: 20211910343248
Authors: Yingzhuo, Xu (1); Xuewen, Wang (1)
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Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
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Article number: 9408917
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ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to analyze the inner needs and purchase behavior of consumers and increase the sales of goods, a community consumer behavior analysis method based on association rules is proposed. First, to solve the problems of the traditional Apriori algorithm, this article optimizes the data set and improves the efficiency of pruning, then uses the optimized Apriori algorithm to mine the consumer purchase records of the community supermarket to find out the correlation between multiple products, which calculating the consumer's preference for goods and getting the corresponding association rules and marketing strategies. Finally, this research uses the shopping data of community supermarket retail to conduct experimental tests to consumer preferences. The results show that the optimized Apriori algorithm is more efficient and the correlation analysis result is more accurate. © 2021 IEEE.
Number of references: 6
Main heading: Consumer behavior
Controlled terms: Association rules - Learning algorithms - Sales - Retail stores
Uncontrolled terms: Apriori algorithms - Behavior analysis - Consumer preferences - Consumer's preferences - Correlation analysis - Experimental test - Marketing strategy - Multiple products
Classification code: 723.4.2 Machine Learning - 903.1 Information Sources and Analysis - 931.3 Atomic and Molecular Physics
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309. Application and Research of Dark Channel Defogging Algorithm in Video Logging Image Enhancement

Accession number: 20211910342848
Authors: Dong, Haifeng (1); Ma, Ruini (1)
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Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
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Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: The video logging technology is applied to detect the general condition of the well. Due to the influence of water fog, the contrast of the video logging image is decreased and the color contrast is distorted. The application and research of the dark channel dehazing algorithm in the video logging image enhancement system is proposed. In this paper, the dark channel defogging algorithm and Retinex defogging algorithm are compared and analyzed respectively, the realization process and application of the two algorithms are described briefly, and the advantages and disadvantages of the two algorithms applied in video logging image enhancement are compared. © 2021 IEEE.
Number of references: 20
Main heading: Image enhancement
Controlled terms: Demulsification - Video recording
Uncontrolled terms: Color contrast - Dehazing - Influence of water - Realization process - Retinex
Classification code: 716.4 Television Systems and Equipment - 802.3 Chemical Operations
DOI: 10.1109/ICSP51882.2021.9409016
Funding Details:
Funding text: Ac k n o w l e d g m e n t This work is supported by the innovation and practice ability training program of Xi'an Petroleum University. This thesis is completed under the guidance of Haifeng Dong. The tutor's profound professional knowledge and rigorous academic attitude have far-reaching influence on me. From topic selection to completion, every step of this paper is completed under the careful guidance of the tutor. Here, I would like to express my high respect and heartfelt thanks to my tutor! In the process of writing papers, we encountered many problems, which were solved under the guidance of teacher. Here, thanks to the Xi'an Petroleum University and my teacher.
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Database: Compendex
Data Provider: Engineering Village
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310. Development and optimization of immersive virtual drilling equipment teaching environment (*Open Access*)

Accession number: 20213810914504
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 2010
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Issue title: 2021 4th International Conference on Computer Information Science and Application Technology, CISAT 2021
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Article number: 012195
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2021 4th International Conference on Computer Information Science and Application Technology, CISAT 2021
Conference date: July 30, 2021 - August 1, 2021
Conference location: Lanzhou, China
Conference code: 171687
Publisher: IOP Publishing Ltd
Abstract: In view of the phenomenon of scene jumps, slow model refresh speed and fixed visual direction during virtual roaming, in the virtual drilling equipment teaching platform developed based on Unity 3D, the Cardinal spline curve interpolation algorithm is used to optimize the roaming path and improve the smoothness of the roaming. It uses rendering optimization algorithm to improve the fluency of the scene and adjusts the visual angle of observation through orientation change technology algorithm for design and optimization. The results show that the optimized drilling equipment teaching platform improves the comfort of roaming learning, the scene loading speed is increased by 28.73%, and the visual orientation is more convenient to observe the experimental objects. On the whole, it provides students with a comfortable and realistic teaching environment. © Content from this work may be used under the terms of the Creative Commons Attribution 3.0 Licence.

Number of references: 10
Main heading: Curve fitting
Controlled terms: Interpolation - Three dimensional computer graphics - Fixed platforms - E-learning - Infill drilling
Uncontrolled terms: Cardinal splines - Design and optimization - Optimized drilling - Orientation changes - Rendering optimizations - Teaching platform - Virtual roaming - Visual directions
Classification code: 511.1 Oil Field Production Operations - 511.2 Oil Field Equipment - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 921.6 Numerical Methods
Numerical data indexing: Percentage 2.87e+01%
DOI: 10.1088/1742-6596/2010/1/012195
Funding Details: Number: 18JS095, Acronym: -, Sponsor: -; Number: -, Acronym: -, Sponsor: Key Science and Technology Program of Shaanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

311. Research on the Submergence Depth Model of Oil Well Pumping

Accession number: 20211910343142
Authors: Liu, Tianshi (1); Zhao, Yun (1); Huang, Yuhu (1)
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Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
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Article number: 9408738
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: After a long period of continuous exploitation, most of oil fields in China have been in a low-permeability or ultra-low-permeability state. In order to grasp the liquid level state of oil wells in real time, the submergence depth model of oil well pumping is constructed by using the law of dynamic liquid level change during the pumping process and the working mode of oil pump. On this basis, according to the relative stability of the parameters, the stroke pumping oil model is transformed into a continuously pumping model with time as a variable. The submergence depth model of pumping oil can be divided into two types according to oil well state, namely the submergence depth model of pumping oil in full pumping state and the submergence depth model of pumping oil in non-full pumping state. The model is applicable to the pumping process of ultra-low permeability oil fields, as well as to the liquid pumping process of straight container. Combined with pumping speed and continuous pumping model, the submergence degree of oil well can be obtained in real time which provides an effective application method to implement reasonable exploitation of the oil field. © 2021 IEEE.
Number of references: 12
Main heading: Oil wells
Controlled terms: Liquids - Pumps
Uncontrolled terms: Application method - Dynamic liquid levels - Liquid pumping - Low permeability - Pumping model - Pumping process - Relative stabilities - Ultra low permeability
Classification code: 512.1.1 Oil Fields - 618.2 Pumps
DOI: 10.1109/ICSP51882.2021.9408738
Funding Details: Number: 2019JM-174, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;

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Database: Compendex
Data Provider: Engineering Village
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312. The Establishment of a Drilling Rate of Penetration Prediction Model Based on GA-BP (*Open Access*)

Accession number: 20212110398123
Authors: Qi, Li (1); Wei, Zhang (1); Cong, Xie (1)
Author affiliation: (1) Xi'An Shiyou University, Yanta District, Xi'an City, Shaanxi Province, China
Source title: Journal of Physics: Conference Series
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: The prediction of ROP is the key to optimization and control of drilling engineering. The lack of application of actual engineering data in existing theoretical models makes it difficult to meet field requirements. This paper establishes a new model for predicting ROP, which combines artificial intelligence algorithms and neural networks. First, the wavelet filtering method is used to reduce the noise of the measured data the measured data at the drilling site, and the input parameters of the ROP prediction model are optimized according to the mutual information correlation analysis to reduce the model redundancy. Secondly, the genetic algorithm (Genetic Algorithm) is used to optimize the initial weights and thresholds of the BP neural network, thereby establishing a new ROP prediction model. The final results show that GA-BP has stronger convergence and search ability and better calculation accuracy. © Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Genetic algorithms
Controlled terms: Forecasting - Neural networks - Infill drilling - Information filtering
Uncontrolled terms: Artificial intelligence algorithms - BP neural networks - Calculation accuracy - Drilling engineering - Engineering data - Mutual informations - Optimization and control - Wavelet filtering
Classification code: 511.1 Oil Field Production Operations - 903.1 Information Sources and Analysis
DOI: 10.1088/1742-6596/1894/1/012072
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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313. Construction of a digital intelligent evaluation platform for energy consumption of large oilfield water injection systems (*Open Access*)

Accession number: 20212110392478
Authors: Ruan, Yan (1); Zhang, Xuliang (1); Ning, Junfeng (1)

Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Ruan, Yan(1439315078@qq.com)
Source title: Journal of Physics: Conference Series
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: With the development of oilfield water injection systems becoming more and more complex, relying on artificial experience to judge the efficiency of energy consumption and the status of the system more difficult. Based on hydraulic theory and matrix theory, establish the characteristic equations of the node unit, pipeline unit and auxiliary unit of the water injection system, and use the flow balance to form the overall matrix equation of the water injection system. Established a theoretical model of water injection system simulation, based on this, build a digital intelligent evaluation platform for water injection system energy consumption. In this way, it simulates the production operation status of the water injection system under theoretical conditions and compares it with the actual production operation data, so as to accurately analyze and evaluate the current status of the water injection system's pipe network energy consumption and the operating efficiency of the branch pipe network energy consumption of each water injection station. The intelligent analysis and evaluation of energy consumption of the water injection pipe network system has been realized, and the optimization and transformation goals have been defined. It has played a significant role in promoting the realization of digital and intelligent oilfield water injection systems. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Energy utilization
Controlled terms: Matrix algebra - Simulation platform - Energy efficiency
Uncontrolled terms: Characteristic equation - Intelligent analysis - Intelligent evaluation - Operating efficiency - Pipe network systems - Production operations - Theoretical modeling - Water injection systems
Classification code: 525.2 Energy Conservation - 525.3 Energy Utilization - 723.5 Computer Applications - 921.1 Algebra
DOI: 10.1088/1742-6596/1894/1/012016
Funding Details: Number: NO.2017CGZH-HJ-08, Acronym: -, Sponsor: -;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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314. Detection of Key Targets in Video Logging Based on Convolutional Neural Network

Accession number: 20213410817046
Authors: Hu, Hongtao (1); Zhang, Qian (1); Wang, Jingyi (1)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an, Shaanxi, China
Source title: 2021 IEEE 6th International Conference on Computer and Communication Systems, ICCCS 2021
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Issue date: April 23, 2021
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Language: English
ISBN-13: 9780738126043
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Conference name: 6th IEEE International Conference on Computer and Communication Systems, ICCCS 2021
Conference date: April 23, 2021 - April 26, 2021
Conference location: Chengdu, China
Conference code: 170923
Sponsor: IEEE; University of Electronics Science and Technology of China
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Video logging is an important means to detect the state of wellbore and ensure the development and production of oilfield. However, the borehole images obtained by video logging are too many interference items and the images are not clear. In order to better observe the state of three key target images of wellbore equipment: collar, leak and perforation, this paper proposes a detection model of key target images of video logging based on Googlenet network. The three key target images obtained from video logging are preprocessed as the input of neural network, and the three key target images are processed by Googlenet network. The multi-scale expression of image features is realized, and the detection accuracy of key target images in wellbore is improved. The experimental data in this paper used the image data set of a certain oilfield in Sichuan obtained by Eagle Eye downhole TV, and the experiment showed that the accuracy of the model in key image detection of wellbore was significantly improved compared with the common neural network VGG16 model and AlexNet model, its F1-Measure was significantly improved. © 2021 IEEE.
Number of references: 12
Main heading: Convolutional neural networks
Controlled terms: Boreholes - Convolution - Deep learning - Oil field equipment - Image enhancement - Oil wells
Uncontrolled terms: Borehole images - Detection accuracy - Detection models - Downholes - Image data - Image detection - Image features - Target images
Classification code: 461.4 Ergonomics and Human Factors Engineering - 511.2 Oil Field Equipment - 512.1.1 Oil Fields - 716.1 Information Theory and Signal Processing
DOI: 10.1109/ICCCS52626.2021.9449168
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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315. Application of Deep Residual Network in Fault Diagnosis of Wellbore

Accession number: 20211910343284
Authors: Hu, Hongtao (1); Wang, Kang (1); Wang, Jingyi (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, Shaanxi, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Pages: 1036-1039
Article number: 9408785
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Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: Aiming at the shortcomings of general CNN wellbore fault identification models that require a large number of samples and low recognition accuracy, this paper proposes a wellbore fault diagnosis model based on the combination of ResNet34 and transfer learning. Migrate the ResNet34 pre-training model to the image data set of four kinds of wellbore faults for training, extract the features of the wellbore fault images, use the feature values as the input of the fully connected neural network classifier, and then classify and identify the data set, which improves the accuracy and training speed of this model. The experimental data in this paper uses the wellbore fault images of an oil field in Shandong obtained by the VideoLog visualization logging platform. The experimental results show that the recognition accuracy of ResNet is 99.2%, which is 8.9% higher than that of MobileNet, indicating ResNet34 has high accuracy in wellbore fault identification. © 2021 IEEE.
Number of references: 12
Main heading: Classification (of information)
Controlled terms: Image enhancement - Deep learning - Failure analysis - Oil fields - Data visualization - Fault detection - Boreholes
Uncontrolled terms: Fault diagnosis model - Fault identifications - Feature values - Fully connected neural network - High-accuracy - Number of samples - Recognition accuracy - Training speed
Classification code: 461.4 Ergonomics and Human Factors Engineering - 512.1.1 Oil Fields - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 903.1 Information Sources and Analysis
Numerical data indexing: Percentage 8.90e+00%, Percentage 9.92e+01%
DOI: 10.1109/ICSP51882.2021.9408785
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316. Tumor imaging diagnosis analysis based on improved KNN algorithm (*Open Access*)

Accession number: 20220411520207
Authors: Wang, Cailing (1); Li, LeiChao (1); He, SuQiang (1); Zhang, Jing (1)
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Part number: 1 of 1
Issue: 1
Issue title: 2021 International Conference on Computer Technology, Information Engineering and Electron Materials, CTIEEM 2021
Issue date: December 9, 2021
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Article number: 012018
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2021 International Conference on Computer Technology, Information Engineering and Electron Materials, CTIEEM 2021
Conference date: October 29, 2021 - October 31, 2021
Conference location: Tianjin, Virtual, China
Conference code: 176000
Publisher: IOP Publishing Ltd
Abstract: As a simple, effective and non-parameter analysis method, knn is widely used in text classification, image recognition, etc. [1]. However, this method requires a lot of calculations in practical applications, and the uneven distribution of training samples will directly lead to a decrease in the accuracy of tumor image classification. To solve this problem, we propose a method based on dynamic weighted KNN to improve the accuracy of classification, which is used to solve the problem of automatic prediction and classification of medical tumor images based on image features and automatic abnormality detection. According to the classification of tumor image characteristics, it can be divided into two categories: benign and malignant. This method can assist doctors in making medical diagnosis and analysis more accurately. The experimental results show that this method has certain advantages compared with the traditional KNN algorithm. © Content from this work may be used under the terms of the Creative Commons Attribution 3.0 Licence.

Number of references: 8
Main heading: Image classification
Controlled terms: Computer aided diagnosis - Learning algorithms - Classification (of information) - Text processing - Medical imaging - Tumors - Image enhancement - Image recognition
Uncontrolled terms: Accuracy of classifications - Analysis method - Effective analysis - Images classification - ON dynamics - Parameter analysis - Simple analysis - Training sample - Tumor images - Tumor imaging
Classification code: 461.1 Biomedical Engineering - 461.2 Biological Materials and Tissue Engineering - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 723.4.2 Machine Learning - 723.5 Computer Applications - 746 Imaging Techniques - 903.1 Information Sources and Analysis - 903.3 Information Retrieval and Use
DOI: 10.1088/1742-6596/2132/1/012018
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

317. Asymmetrical fault analysis on distribution feeders with inverter interfaced distributed generators (*Open Access*)

Accession number: 20203809206306
Authors: Li, Yingliang (1); Wang, Deming (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Li, Yingliang(yingliang.li@hotmail.com)
Source title: International Journal of Electrical Power and Energy Systems
Abbreviated source title: Int J Electr Power Energy Syst
Volume: 125
Issue date: February 2021
Publication year: 2021
Article number: 106514
Language: English
ISSN: 01420615
CODEN: IEPSDC
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: As the penetration level of the inverter interfaced distributed generators (IIDGs) increases, it is necessary to consider the effect of the IIDG connection on fault analysis in distribution networks. To extend the conventional analysis methods, this paper proposed a sequence component-based method to analyse the asymmetrical short-circuit faults. The boundary condition alternation caused by the IIDG connection was presented as well as its effect on the phase components of the feeder fault currents. Moreover, the difference between fault currents before and after IIDG connection was analysed, considering the boundary condition alternation. The fault current values obtained in network without IIDG connection were used to calculate fault currents of the feeders connected with IIDGs, which can simplify the calculation process and reduce the calculation time. The proposed method was programmed and implemented on different cases, and results were compared with the simulation and conventional analysis method. Comparisons demonstrated the improvements of the proposed method in accuracy of the results and calculation time. The new method can be conveniently integrated into software packages for power system analysis and relay protection evaluation. © 2020
Number of references: 31
Main heading: Boundary conditions
Controlled terms: Electric equipment protection - Electric inverters - Feeding - Distributed power generation - Electric fault currents
Uncontrolled terms: Calculation process - Conventional analysis method - Distributed generators - Distribution feeders - Penetration level - Power system analysis - Sequence components - Short-circuit fault
Classification code: 691.2 Materials Handling Methods - 701.1 Electricity: Basic Concepts and Phenomena - 704.2 Electric Equipment - 706.1.2 Electric Power Distribution
DOI: 10.1016/j.ijepes.2020.106514
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2020JM-542, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was supported by the Talented Scholars Research Scheme of Shaanxi Provincial Government of China, Xi'an Shiyou University Research Project, and the Natural Science Basic Research Program

of Shaanxi (No. 2020JM-542).This work was supported by the Talented Scholars Research Scheme of Shaanxi Provincial Government of China, Xi'an Shiyou University Research Project, and the Natural Science Basic Research Program of Shaanxi (No. 2020JM-542).
Compendex references: YES
Open Access type(s): All Open Access, Hybrid Gold
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

318. Research on partial discharge signal denoising of transformer based on improved CEEMD and adaptive wavelet threshold

Accession number: 20221311849249
Authors: Zhang, Qingqing (1); Lou, Li (1)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University, Shaanxi, Xi'an, China
Corresponding author: Zhang, Qingqing(18292567103@163.com)
Source title: 2021 3rd International Academic Exchange Conference on Science and Technology Innovation, IAECST 2021
Abbreviated source title: Int. Acad. Exch. Conf. Sci. Technol. Innov., IAECST
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Issue title: 2021 3rd International Academic Exchange Conference on Science and Technology Innovation, IAECST 2021
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Pages: 1708-1712
Language: English
ISBN-13: 9781665402675
Document type: Conference article (CA)
Conference name: 3rd International Academic Exchange Conference on Science and Technology Innovation, IAECST 2021
Conference date: December 10, 2021 - December 12, 2021
Conference location: Guangzhou, China
Conference code: 177076
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Because of the interference of white noise, the traditional denoising method is not ideal for partial discharge signal of transformer. To solve this problem, a fusion denoising method combining sample entropy with improved Complementary Ensemble Empirical Mode Decomposition (CEEMD) and Adaptive Wavelet Threshold is proposed. In this method, the original noisy signal is decomposed by CEEMD, and the modal of the Intrinsic Mode Fiction (IMF) is determined by introducing sample entropy, and the IMF component of noise is suppressed by using adaptive wavelet threshold denoising. The simulation results show that the fusion denoising method can effectively suppress the noise in partial discharge signal, and the denoising signal with high signal-to-noise ratio and low root mean square error can be obtained. © 2021 IEEE.
Number of references: 13
Main heading: Empirical mode decomposition
Controlled terms: White noise - Wavelet decomposition - Mean square error - Signal denoising - Entropy - Signal to noise ratio - Partial discharges
Uncontrolled terms: Adaptive wavelet threshold denoising - Adaptive wavelet thresholds - Complementary ensemble empirical mode decomposition - Denoising methods - Empirical Mode Decomposition - Intrinsic modes - Partial discharge signal - Partial discharge signal of transformer - Sample entropy - Wavelet threshold de-noising
Classification code: 641.1 Thermodynamics - 701.1 Electricity: Basic Concepts and Phenomena - 716.1 Information Theory and Signal Processing - 921.3 Mathematical Transformations - 922.2 Mathematical Statistics
DOI: 10.1109/IAECST54258.2021.9695898
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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319. Rock Thin-SectionImage Classification based on Residual Neural Network

Accession number: 20211910343200

Authors: Guojian, Cheng (1); Peisong, Li (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, ShaanXi, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 521-524
Article number: 9408983
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: When classifying rock slices, due to the small particle size of the rock slices, the classification is difficult. When manual methods are used for identification, the efficiency is low and subject to subjective factors. Therefore, this paper proposes a rock based on residual network The method of classifying granular images. This method uses the ResNet50 and ResNet101 models in the residual network to realize the automatic extraction of image features, and establishes a classifier to realize the classification based on the size of the rock slice image. This experiment uses 10,000 rock slice images obtained from the Ordos Basin, and uses 8,000 of them as the training set The residual network model is used for training, and then another 2,000 images are used to test the model. The experimental results show that two networks The accuracy of the classification results of the structure in the test set reached 90.24% and 91.63%. By using the residual network model to classify based on the rock slice image, an efficient and accurate classification effect can be obtained. © 2021 IEEE.
Number of references: 12
Main heading: Image classification
Controlled terms: Rocks - Classification (of information) - Particle size
Uncontrolled terms: Automatic extraction - Classification results - Image features - Manual methods - Network modeling - Ordos Basin - Small particle size - Training sets
Classification code: 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis
Numerical data indexing: Percentage 9.02e+01%, Percentage 9.16e+01%
DOI: 10.1109/ICSP51882.2021.9408983
Funding Details: Number: 2015GY104, Acronym: -, Sponsor: -; Number: 2011ZX05044, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This experiment was supported by the National Science and Technology Major Project (2011ZX05044); Shaanxi Province Industrial Science and Technology Research Project (2015GY104)
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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320. Research on Forecasting Method of Oil Well Liquid Production

Accession number: 20211910343120
Authors: Liu, Tianshi (1); Yang, Xuan (1); Li, Tianrui (1); Huang, Yuhu (1); Peng, Han (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an; 710065, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Article number: 9408715
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Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In the middle or late stage of oilfield exploitation in China, the storage speed of oil well does not match pumping speed, resulting in pumping unit in the state of 'non-full pumping' or 'empty pumping', which wastes lots of electricity. This paper used overdetermined equation and neural networks to predict liquid production after eliminating dimensional influence among oil well feature data with normalization method. Comparing the results with the regression equation, the effect of neural network is better than the other two methods in the case of large amounts of data. Even under the same training set, the results of the two neural networks are quite different. According to the prediction results of regular data, the effect of neural networks are significantly affected by the characteristics and quantity of the sample data. Therefore, appropriate prediction method in the prediction of liquid production can provide reference for oilfield management. © 2021 IEEE.
Number of references: 9
Main heading: Forecasting
Controlled terms: Backpropagation - Liquids - Oil wells - Pumps - Digital storage
Uncontrolled terms: Forecasting methods - Large amounts of data - Normalization methods - Oilfield exploitation - Prediction methods - Pumping speed - Regression equation - Training sets
Classification code: 512.1.1 Oil Fields - 618.2 Pumps - 722.1 Data Storage, Equipment and Techniques - 723.4 Artificial Intelligence
DOI: 10.1109/ICSP51882.2021.9408715
Funding Details: Number: 2019JM-174, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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321. Design of DC filter for 24-pulse high power rectifier

Accession number: 20214511132583
Authors: Ling, Zhuo (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an, Shaanxi Province, China
Source title: Proceedings of SPIE - The International Society for Optical Engineering
Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 11930
Part number: 1 of 1
Issue title: International Conference on Mechanical Engineering, Measurement Control, and Instrumentation
Issue date: 2021
Publication year: 2021
Article number: 119302P
Language: English
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CODEN: PSISDG
ISBN-13: 9781510647282
Document type: Conference article (CA)
Conference name: International Conference on Mechanical Engineering, Measurement Control, and Instrumentation 2021
Conference date: July 16, 2021 - July 18, 2021
Conference location: Guangzhou, China
Conference code: 173232
Sponsor: AEIC Academic Exchange Information Centre; The Society of Photo-Optical Instrumentation Engineers (SPIE)
Publisher: SPIE
Abstract: Conventional high power rectifier with 24 pulse output usually uses flat wave reactor in the DC side to suppress the ripple contained in the output waveform, so that the output DC is close to the ideal DC. Although this method has good economic benefit, the filtering effect is not good. Firstly, the necessity of installing DC filter is

analyzed from the harmonic component. Secondly, according to the impedance-frequency characteristic equation, the parameter calculation formula of the double-tuned filter is deduced. Finally, the ideal output waveform of the main circuit is obtained through Matlab/Simulink simulation, and the feasibility of filtering specific sub-harmonics by the double-tuned filter is preliminarily verified by FFT analysis, and the ideal filtering effect is obtained. © 2021 SPIE.
Number of references: 5
Main heading: MATLAB
Controlled terms: Rectifying circuits - Electric rectifiers
Uncontrolled terms: 24-pulse - DC side - Double-tuned filters - Economic benefits - Filtering effects - Harmonics component - High power - Impedance-frequency characteristic - Output waveform - Power rectifiers
Classification code: 723.5 Computer Applications - 921 Mathematics
DOI: 10.1117/12.2611604
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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322. Comparison Study of Leading Rotary Steerable System and Future Development Trend (*Open Access*)

Accession number: 20212110392477
Authors: Fei, Li (1); Xue-Ying, Ma (1); Yu-Qi, Tan (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University China, Shaanxi, Xi'an, China
Source title: Journal of Physics: Conference Series
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Publication year: 2021
Article number: 012015
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: The rotary steerable system is critical drilling equipment urgently needed in the development of unconventional oil and gas fields in China. It is still a significant but unavailable technology for China's petroleum industry. With the high demand for rotary steerable system in unconventional oil and gas development, this paper studies RSS tools from major oilfield service companies. Different tools from major oilfield service companies and their technical specifications were studied. Firstly, the development history of the rotary steerable system is introduced, and the tools are then classified into different categories based on control and biasing methodologies. The key technical parameters of the RSS were compared and analyzed. Moreover, a detailed comparison of the 475, 675 and 900 series of tools has been carried out. The current development focuses of rotary steerable tools include high dogleg severity, high temperature and high pressure and integrated navigation scheme with inertial and magnetic methods. Finally, the development trends of the RSS were forecasted. The objective of this paper is to provide an overview and latest development of the rotary steerable system for developer, operation and maintenance population in the drilling industry. © Published under licence by IOP Publishing Ltd.
Number of references: 27
Main heading: Gas industry
Controlled terms: Infill drilling - Oil fields - Rotating machinery - Petroleum industry
Uncontrolled terms: Development history - High temperature and high pressure - Integrated navigation - Oilfield service company - Operation and maintenance - Rotary steerable systems - Technical specifications - Unconventional oil and gas

Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 522 Gas Fuels - 601.1 Mechanical Devices
DOI: 10.1088/1742-6596/1894/1/012015
Funding Details: Number: U20B2029, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 20JS125, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This research was funded by the National Science Foundation of China (Grant No. U20B2029) and the Scientific Research Program Funded by the Shaanxi Provincial Education Department (Grant No. 20JS125).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

323. An ecofriendly and reusable solid acid catalyst ZrO2-SIEC for highly selective alkylation of 2,4/2,5-xylenol

Accession number: 20212810619869
Authors: Sun, Wu-Juan (1); Ke, Cong-Yu (1); Chen, Li-Yang (1); Wang, Si-Chang (1); Zhang, Qun-Zheng (1); Zhang, Xun-Li (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an, China
Corresponding author: Zhang, Xun-Li(xlzhang@xsyu.edu.cn)
Source title: Asia-Pacific Journal of Chemical Engineering
Abbreviated source title: Asia-Pac. J. Chem. Eng.
Volume: 16
Issue: 5
Issue date: September/October 2021
Publication year: 2021
Article number: e2687
Language: English
ISSN: 19322135
E-ISSN: 19322143
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: Monodisperse composite microspheres were prepared of zirconia and urea formaldehyde resin having an average particle size of 2.2 μm. Their surface was modified by silane coupling agent and styrene, and then sulfuric acid assisted with silver sulfate to form solid sulfonic acid based ion-exchange catalyst (namely, ZrO2-SIEC) for the alkylation of 2,4/2,5-xylenol mixture. The selectivities of catalyst ZrO2-SIEC to produce 6-2,4-xylenol and 4-2,5-xylenol were found to be 98.9% and 97.9%, with yields of 98.6% and 80.9%, respectively. The optimized reaction conditions were identified including temperature (80°C), catalyst dosage (9%) and reaction time (180 min). In addition, catalyst ZrO2-SIEC showed good reusability for maintaining stable catalytic performance over 25 cycles of reuse, attributed to its stable mechanical, thermal and chemical properties. Comparison with other four catalysts demonstrated good performance of ZrO2-SIEC in terms of catalytic activity, operating conditions, separation from products, and environmental friendliness. © 2021 Curtin University and John Wiley & Sons, Ltd.
Number of references: 32
Main heading: Zirconia
Controlled terms: Catalyst activity - Silver compounds - Urea - Ion exchange - Reusability - Alkylation - Coupling agents - Styrene - Sulfur compounds - Particle size
Uncontrolled terms: Average particle size - Catalytic performance - Environmental friendliness - Monodisperse composite microsphere - Optimized reaction conditions - Silane coupling agent - Solid acid catalysts - Solid sulfonic acids
Classification code: 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 8.09e+01%, Percentage 9.00e+00%, Percentage 9.79e+01%, Percentage 9.86e+01%, Percentage 9.89e+01%, Size 2.20e-06m, Temperature 3.53e+02K, Time 1.08e+04s
DOI: 10.1002/apj.2687
Funding Details: Number: GM 16925, Acronym: NSF, Sponsor: National Science Foundation; Number: -, Acronym: NIH, Sponsor: National Institutes of Health;
Funding text: We are grateful for the support of grant PCM 80-03725 from the National Science Foundation and grant GM 16925 from the National Institutes of Health. T. C. Terwilliger is a predoctoral fellow of the National Science Foundation.

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Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

324. Research of DBN PLSR algorithm Based on Sparse Constraint

Accession number: 20214411086638
Authors: Liu, Mengxi (1); Li, Yingliang (1)
Author affiliation: (1) School of Electronic and Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Mengxi(26702163@qq.com)
Source title: ACM International Conference Proceeding Series
Abbreviated source title: ACM Int. Conf. Proc. Ser.
Part number: 1 of 1
Issue title: Proceeding of PRIS 2021 - 2021 3rd International Conference on Pattern Recognition and Intelligent Systems
Issue date: July 28, 2021
Publication year: 2021
Pages: 43-46
Language: English
ISBN-13: 9781450390392
Document type: Conference article (CA)
Conference name: 3rd International Conference on Pattern Recognition and Intelligent Systems, PRIS 2021
Conference date: July 28, 2021 - July 30, 2021
Conference location: Virtual, Online, Thailand
Conference code: 172564
Publisher: Association for Computing Machinery
Abstract: DBN is a generative model based on unsupervised learning, with strong computing and information processing capabilities. But at the same time, there are some drawbacks: the model is constructed through intensive expression, which leads to relatively low computing performance of the network. The network optimization method based on the BP algorithm is easy to fall into a local minimum, which makes DBN fine-tuning accuracy is reduced. In order to obtain a DBN that is efficient and can avoid local optimization, the paper designs a DBN based on adaptive sparse representation and partial least square regression (PLSR) fine-tuning. First, two regularization factor terms are introduced to punish the densely expressed connection characteristics, thereby constructing an sparse RBM. Secondly, PLSR method is adopted instead of the BP algorithm, and a PLSR model is established between every two layers from the output layer to the input layer. The experiment proved the effectiveness of optimized DBN in improving network performance and learning performance. Project Supported by Natural Science Basic Research Program of Shaanxi (Program No.2020JQ-788). Project Supported by Natural Science Basic Research Program of Shaanxi (ProgramNo.2020JM-542). © 2021 ACM.
Number of references: 13
Uncontrolled terms: BP algorithm - DBN - Defect recognition - Fine tuning - Generative model - Least-square regression algorithms - Partial least square regression - Partial least square regression fine-tuning - Research programs - Sparse constraint
DOI: 10.1145/3480651.3480688
Funding Details: Number: ProgramNo.2020JM-542, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: Project Supported by Natural Science Basic Research Program of Shaanxi (ProgramNo.2020JM-542).Project Supported by Natural Science Basic Research Program of Shaanxi (Program No.2020JQ-788).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

325. Composite Decoupling Control of PMSM Based on Extended State Observer (*Open Access*)

Accession number: 20220411535724
Authors: Yan, Hongliang (1); Geng, Yan (1); Zhai, Weizhi (1)
Author affiliation: (1) School of Electric Engineering, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China
Corresponding author: Geng, Yan(438600221@qq.com)

Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 2137
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Issue title: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
Issue date: December 8, 2021
Publication year: 2021
Article number: 012003
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
Conference date: October 29, 2021 - October 31, 2021
Conference location: Xi'an, Virtual, China
Conference code: 176003
Publisher: IOP Publishing Ltd
Abstract: In order to solve the problem that the dynamic decoupling performance of the traditional decoupling method is reduced due to the parameter disturbance of permanent magnet synchronous motor (PMSM), a composite decoupling control method based on extended state observerESO) is proposed in this paper. In this method,voltage drop across stator resistance,cross coupling terms,internal uncertains and external load torque are taken as disturbances. The disturbance is observed in real time by using the extended state observer and compensated to the output end of the current controller, so as to realize the current decoupling control of the system and achieve the purpose of precise control of the current loop. The results of theoretical analysis show and simulation show that the composite decoupling control strategy based on extended state observer has better dynamic decoupling effect. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 5
DOI: 10.1088/1742-6596/2137/1/012003
Funding Details: Number: 15JS084, Acronym: -, Sponsor: -;
Funding text: This paper is funded by Shaanxi Provincial Department of Education Key Laboratory Project (15JS084), Graduate Innovation and Practical Ability Training Program of Xi 'an Shiyou University.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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326. Aircraft attitude data fusion based on gradient descent algorithm

Accession number: 20214311074622
Authors: Li, Donghang (1); Gao, Yi (1); Xie, Junxi (1); Guo, Piao (1)
Author affiliation: (1) Xi'An Shiyou University, School of Electronic Engineering, Xi an; 710065, China
Source title: ACM International Conference Proceeding Series
Abbreviated source title: ACM Int. Conf. Proc. Ser.
Part number: 1 of 1
Issue title: ICRCA 2021 - 2021 5th International Conference on Robotics, Control and Automation; Worshop - 2021 5th International Conference on Robotics and Machine, ICRMV 2021
Issue date: March 5, 2021
Publication year: 2021
Pages: 78-82
Language: English
ISBN-13: 9781450387484
Document type: Conference article (CA)
Conference name: 5th International Conference on Robotics, Control and Automation, ICRCA 2021
Conference date: February 26, 2021 - February 28, 2021
Conference location: Virtual, Online, Korea, Republic of
Conference code: 172497
Publisher: Association for Computing Machinery

Abstract: In aircraft control, the inertial measurement unit of the carrier is equipped with multiple sensors to collect real-time attitude data, and the master controller can control the flight state of the aircraft by fusing and solving the data. Using gradient descent algorithm, the data of gyroscope, accelerometer and magnetometer can be fused organically, and their measurement advantages can be brought into play, and finally the attitude information at each data acquisition time can be solved. Experiments show that when solving the data generated by the equipment of attitude and heading reference system running around the preset trajectory, the solving program can effectively fuse the data of each sensor with high accuracy. © 2021 ACM.
Number of references: 15
Main heading: Aircraft control
Controlled terms: Data fusion - Data acquisition - Gradient methods - Flight control systems
Uncontrolled terms: Acquisition time - Attitude and headings - Computing methodologies - Gradient descent algorithms - Inertial measurements units - Model and simulation - Model development - Modeling analyzes - Multiple sensors - Real-time attitude
Classification code: 652 Aircraft and Avionics - 652.3 Aircraft Instruments and Equipment - 723.2 Data Processing and Image Processing - 731.1 Control Systems - 921.6 Numerical Methods
DOI: 10.1145/3471985.3472378
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Funding text: Supported by Xi an Shiyou University Postgraduate Innovation and Practical Ability Training Program. Fund project: National Natural Science Foundation of China (No. 51604226). General Project of Shaanxi Natural Science Foundation (No. 2018JM5064).Supported by Xi'an Shiyou University Postgraduate Innovation and Practical Ability Training Program.Fund project: National Natural Science Foundation of China (No. 51604226).General Project of Shaanxi Natural Science Foundation (No. 2018JM5064).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

327. Optimal dispatch of multi-virtual power plants based on Grey Wolf optimization algorithm (*Open Access*)

Accession number: 20213810907757
Authors: Li, Yingliang (1); Zhou, Liwen (1); Gao, Zhaodi (1); He, Kun (1); Cai, Heming (1); Sun, Xiyao (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China
Corresponding author: Li, Yingliang(yingliang.li@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
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Issue title: 2021 International Conference on Information Technology and Intelligent Control, CITIC 2021
Issue date: August 24, 2021
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Conference name: 2021 International Conference on Information Technology and Intelligent Control, CITIC 2021
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Conference location: Guilin, Virtual, China
Conference code: 171600
Publisher: IOP Publishing Ltd
Abstract: The day-ahead scheduling of virtual power plant (VPP) is of great significance for the development of distributed generations. To solve the problem of large-scale VPP scheduling, this paper proposes a multi-VPPs optimal dispatching strategy. In this model, the VPP is divided into multiple sub-VPPs, and each sub-VPP scheduled internally. Likewise, the power interaction between each sub-VPP at the contract price is allowed. This model can realize complementary power, and hence maximize economic benefit of VPP and also improve the level of new energy consumption. Then, to solve this nonlinear optimization problem, Grey Wolf Optimization (GWO) algorithm is

employed. Finally, the proposed model is tested through a detailed case study, and results demonstrate that the GWO algorithm can improve the computational efficiency. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 14
Main heading: Energy utilization
Controlled terms: Computational efficiency - Virtual Power Plants - Electric load dispatching - Nonlinear programming - Scheduling
Uncontrolled terms: Day-ahead scheduling - Economic benefits - Non-linear optimization problems - Optimal dispatch - Optimal dispatching - Optimization algorithms - Virtual power plants - Virtual power plants (VPP)
Classification code: 525.3 Energy Utilization - 706.1.1 Electric Power Transmission - 912.2 Management
DOI: 10.1088/1742-6596/2005/1/012080
Funding Details: Number: 2021KW-33, Acronym: -, Sponsor: -; Number: 2021JM-404, Acronym: -, Sponsor: -; Number: U20B2029, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020JM-542, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was supported by the Natural Science Basic Research Program of Shaanxi (No. 2020JM-542), the National Science Foundation of China (Grant No. U20B2029), the Science and Technology Basic Research Program of Shaanxi (No. 2021JM-404), and the Key Research Program of Shaanxi (No. 2021KW-33). And funded by Xi'an Shiyou University Graduate Student Innovation and Practice Ability Training Program.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
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328. Creation of informational learning situation: Research on the design and application of scientific concept learning model supported by computer

Accession number: 20214911287604
Authors: Yang, Wen-Yang (1); Zhang, Feng (1)
Author affiliation: (1) Xi'An Shiyou University, The School of Computer, Shaanxi, Xi'an; 710065, China
Corresponding author: Yang, Wen-Yang(ywy80910@163.com)
Source title: ACM International Conference Proceeding Series
Abbreviated source title: ACM Int. Conf. Proc. Ser.
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Language: English
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Document type: Conference article (CA)
Conference name: 6th International Conference on Distance Education and Learning, ICDEL 2021
Conference date: May 21, 2021 - May 24, 2021
Conference location: Virtual, Online, China
Conference code: 174664
Publisher: Association for Computing Machinery
Abstract: In the process of promoting informational education, in the view of the problems in the actual classroom, classroom teaching reform is the core of education reform. The current classroom is difficult to cultivate the core qualities that students can adapt to the needs of lifelong development and social development. The creation of learning situations is the main way for deep integration of information technology and science courses, and it is also an effective measure to cultivate learners' core qualities. This research system summarizes the main problems existing in the current scientific concept learning, and uses the thinking-based classroom learning theory as a guide to design the scientific concept learning model supported by the informational learning situations. The research results show that learners have the highest level of understanding of scientific concepts in the learning of scientific concepts supported by informational learning situations. In terms of changes in the motivation of science learning, the performance of self-efficacy, achievement goals, and learning context inducement are the most obvious, except for the decrease of performance target factors. Learners have a higher degree of scientific learning motivation to participate in the learning of scientific concepts supported by informational learning situations. © 2021 ACM.
Number of references: 26
Main heading: Motivation
Controlled terms: Learning systems - Education computing - Students

Uncontrolled terms: 'current - Concept learning - Design and application - Informational learning situation - Learning models - Learning motivation - Learning situation - Scientific concept - Scientific learning motivation - Situational learning interest
Classification code: 912.4 Personnel
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Funding text: Creation of Informational Learning Situation: Research on the Design and Application of Scientific Concept Learning Model Supported by Computer
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Data Provider: Engineering Village
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329. A Brief Overview of Deep Learning and Memristor (*Open Access*)

Accession number: 20212110398137
Authors: Cheng, Guojian (1); An, Xiaoxin (1)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University, Xi'an Shaanxi; 15029188968, China
Source title: Journal of Physics: Conference Series
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Volume: 1894
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: At present, the deep learning has become a main topic in academic and engineering domain. It has been considered to be the general solutions to solve various of classification, clustering, regression and generate tasks in all fields, but it needs higher computing power at the same time. In other words, it needs the new equipment possessing lower power consumption and higher efficiency, which further triggers the development of new hardware and computing technology. A kind of promising solution is an emerging equipment known as memristor, which can be naturally mixed into a feasible computing device to realize neural computing to extend computing power of existing hardware. In this paper, more convenience and practically of using memristor to realize deep neural networks are obtained by summarizing mechanism of deep learning and structure of memristor. © Published under licence by IOP Publishing Ltd.
Number of references: 11
Main heading: Memristors
Controlled terms: Energy efficiency - Green computing - Computing power - Deep neural networks
Uncontrolled terms: Computing devices - Computing power - Computing technology - Engineering domains - General solutions - Higher efficiency - Lower-power consumption - Neural computing
Classification code: 454 Environmental Engineering - 461.4 Ergonomics and Human Factors Engineering - 525.2 Energy Conservation - 714.2 Semiconductor Devices and Integrated Circuits - 722.2 Computer Peripheral Equipment - 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications
DOI: 10.1088/1742-6596/1894/1/012086
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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330. Study on the cause of venture capital investment in china's clean energy

Accession number: 20213510822819
Authors: Ning, Yuxin (1); Wang, Jiamei (1)
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Issue title: Proceedings of the 6th International Conference on Information Management and Technology, CIMTECH 2021
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Article number: 3465738
Language: English
ISBN-13: 9781450385015
Document type: Conference article (CA)
Conference name: 6th International Conference on Information Management and Technology, CIMTECH 2021
Conference date: August 19, 2021 - August 20, 2021
Conference location: Jakarta, Indonesia
Conference code: 171281
Publisher: Association for Computing Machinery
Abstract: Clean energy is a new energy that has been continuously developed and expanded along with the energy revolution and changes in the energy market. For a long time, investment in the clean energy sector has relied heavily on government fiscal funds and bank credits, and it is urgent to change its main form of financing through the capital market. As a high-growth, high-tech and high-risk equity capital, venture capital is an important capital force to promote clean energy financing transformation. Therefore, this article is based on the data of 25 provinces' venture capital investment in clean energy investment, and discusses the important reasons for promoting venture capital investment in this field. The study shows that factors such as the scale of economic development, carbon intensity, energy intensity, technology market, and the scale of private enterprises in each province have a significant impact on the venture capital investment in the clean energy sector. This article did not find that the government's public policy has a "crowding-out effect"on private capital. Second, the activeness of technology trading and the size of the financial market are also important thrusts for investment in the venture capital clean energy field. In terms of macro factors, the impact of oil prices and coal prices on investment in clean energy is also very obvious. © 2021 ACM.
Number of references: 10
Main heading: Investments
Controlled terms: Commerce - Economic and social effects - Energy Intensity - Costs - Financial markets
Uncontrolled terms: Carbon intensity - Clean energy investments - Energy intensity - Energy markets - Private capital - Private enterprise - Venture Capital - Venture capital investments
Classification code: 525.6 Energy Policy - 911 Cost and Value Engineering; Industrial Economics - 971 Social Sciences
DOI: 10.1145/3465631.3465738
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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331. Review of research on public venture capital and its future prospects

Accession number: 20213510822818
Authors: Ning, Yuxin (1); Chu, Tingting (1)
Author affiliation: (1) College of Economics and Management, University of xi'An Shiyou, Xi'an, China
Corresponding author: Ning, Yuxin(nyx91@sina.com)
Source title: ACM International Conference Proceeding Series
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Document type: Conference article (CA)
Conference name: 6th International Conference on Information Management and Technology, CIMTECH 2021
Conference date: August 19, 2021 - August 20, 2021
Conference location: Jakarta, Indonesia
Conference code: 171281
Publisher: Association for Computing Machinery
Abstract: The government's involvement in the venture capital industry has become the consensus of many governments in many countries or regions. However, there is no lack of doubts about the effect of public venture capital implementation in practices. With this background, this article involves the review of the foreign literature on "public venture capital", combing the theoretical hypothesis of the investment effect of public venture capital and the results of the investment effect test, and discussing the endogenous and heterogeneous effects of the test. Finally, the future direction of public venture capital research should be developed in terms of the mixing ratio of public venture capital and private venture capital. © 2021 ACM.
Number of references: 10
Main heading: Investments
Controlled terms: Computer programming
Uncontrolled terms: Future prospects - Heterogeneous effects - Mixing ratios - Private venture - Venture Capital
Classification code: 723.1 Computer Programming
DOI: 10.1145/3465631.3465737
Compendex references: YES
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332. Concise synthesis of α–cyano tetrahydroisoquinolines with a quaternary centerviaStrecker reaction (*Open Access*)

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Authors: Ji, Yue (1); Zhang, Xue (1); Han, Weiwei (1); Wang, Sichang (1); Wu, Ya (1); Zhang, Keliang (1); Yang, Penghui (1); Xiao, Pei (1); Wei, Yitao (1)
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Corresponding author: Ji, Yue(jiyue@xsyu.edu.cn)
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Publication year: 2021
Pages: 38712-38716
Language: English
E-ISSN: 20462069
CODEN: RSCACL
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A concise synthesis of α–cyano tetrahydroisoquinolines with a quaternary centerviathe Strecker reaction was successfully realized by employing TMSCN as cyano source and KF as fluoride source, furnishing the products with up to 99% yield. An isomerization of α–cyano tetrahydroisoquinoline was observed under alkaline conditions to give the isomervia[1,3]-H shift. © The Royal Society of Chemistry 2021.
Number of references: 54
Main heading: Fluorine compounds
Controlled terms: Positive ions
Uncontrolled terms: Alkaline conditions - Concise synthesis - Strecker reactions - Tetrahydroisoquinolines
Numerical data indexing: Percentage 9.90E+01%
DOI: 10.1039/d1ra08469k
Funding Details: Number: YCS20211027, Acronym: -, Sponsor: -; Number: 20200606, Acronym: -, Sponsor: -; Number: 21801204,22005242, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number:

2021JQ-584, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 20JK0830, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: We are grateful for the nancial support from the National Natural Science Foundation of China (No. 21801204, 22005242), the Young Talent Fund of University Association for Science and Technology in Shaanxi Province of China (No. 20200606), the Research on the Training Plan of Innovation, Practice Ability of Postgraduates of Xi'an Shiyou University (No. YCS20211027), Scientic Research Program Funded by Shaanxi Provincial Education Department (20JK0830) and the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2021JQ-584). The authors would like to thank RuiJun Ren from Shiyanjia Lab (www.shiyanjia.com) for the support of NMR test.
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333. Preparation of Ti-Si intermetallic compound porous membrane materials

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Title of translation: Ti-Si
Authors: Liu, Zhuo-Meng (1); Liu, Zhong-Jun (1); Ji, Shuai (1)
Author affiliation: (1) College of Materials and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Zhong-Jun(zjliu@xsyu.edu.cn)
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Issue date: September 28, 2021
Publication year: 2021
Pages: 2490-2498
Language: Chinese
ISSN: 10040609
CODEN: ZYJXFK
Document type: Journal article (JA)
Publisher: Central South University of Technology
Abstract: Ti powder and high-purity quartz tube were used as raw materials, and combined with cold isostatic pressing and vacuum sintering process, a new porous material using porous titanium as matrix and Ti-Si intermetallic compound as porous membrane was prepared. The phase composition and microstructure of the sintered product were observed and analyzed by XRD, EDS and SEM. The results show that the thickness and pore size of the Ti-Si intermetallic compound porous membrane are 2-3 μm and less than 0.3 μm. At the same time, the effect of Ti powder in different particle size ranges on the uniformity of Ti-Si porous membrane was also studied. A composite porous material using porous titanium as matrix and Ti-Si intermetallic compound as porous membrane was successfully prepared by in-situ reaction sintering in a limited zone, which provides a new way for the preparation of metal gradient porous materials. © 2021, China Science Publishing & Media Ltd. All right reserved.
Number of references: 24
Main heading: Porous materials
Controlled terms: Pore size - Powder metallurgy - Powder metals - Silicon compounds - Sintering - Particle size - Hot isostatic pressing - Hydrides - Vacuum applications - Intermetallics
Uncontrolled terms: Composite porous materials - High purity - In-situ reactions - Intermetallics compounds - matrix - Membrane material - Porous membranes - Porous titania - Ti powders - Ti-si intermetallic compound
Classification code: 531.1 Metallurgy - 633.1 Vacuum Applications - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Size 2.00E-06m to 3.00E-06m, Size 3.00E-07m
DOI: 10.11817/j.ysxb.1004.0609.2021-36493
Funding Details: Number: S201910705050, Acronym: -, Sponsor: -; Number: 2016BS21, Acronym: -, Sponsor: -; Number: XGH17091, Acronym: -, Sponsor: -; Number: 2019QNKYCXTD12, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: Project(51704239) supported by the National Natural Science Foundation of China; Project (2019QNKYCXTD12) supported by the Youth Innovation Team Foundation of Xi'an Shiyou University, China; Project(XGH17091) supported by the 2017 Higher Education Scientific Research Program of Shaanxi Association of Higher Education, China; Project(S201910705050) supported by the Scientific Research Innovation Training

Program of Shaanxi Province, China; Project(2016BS21) supported by the Youth Science and Technology Innovation Foundation of Xi'an Shiyou University, China.
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334. Study on Chinese text classification for FastText that combing TF-RF and improved random walk model

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Authors: Wang, Zheng (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, Shaanxi; 710065, China
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: FastText is a text classification model by Facebook. As the model is simple in structure, it has the advantage of fast and efficient. However, when the model is used in Chinese text classification, the accurate rate will decrease. To this end, a Chinese FastText text classification method combing Term Frequency-Relevance Frequency (TF-RF) and improved random walk model is suggested in the paper. The method makes TF-R weight choice to N-gram processed dictionaries during the input stage of the FastText model, making semantic analysis by using Probabilistic Latent Semantic Analysis (PLSA), and supplements to feature words; then utilizes the improved random walk model to improve the accuracy, and the improved model is more suitable for Chinese text classification. The experiment result shows that improved model in the paper has a better effect to Chinese text classification. © 2021 IEEE.
Number of references: 15
Main heading: Semantics
Controlled terms: Text processing - Random processes - Classification (of information)
Uncontrolled terms: Chinese text classification - Feature words - Probabilistic latent semantic analysis - Random walk modeling - Semantic analysis - Term Frequency - Text classification methods - Text classification models
Classification code: 716.1 Information Theory and Signal Processing - 903.1 Information Sources and Analysis - 903.3 Information Retrieval and Use - 922.1 Probability Theory
DOI: 10.1109/ICSP51882.2021.9408910
Funding Details: Number: CCF-1453073,ECCS-1509260, Acronym: NSF, Sponsor: National Science Foundation; Number: W911NF-14-1-0295, Acronym: ARO, Sponsor: Army Research Office; Number: -, Acronym: OoR, Sponsor: Office of Research-Wichita, School of Medicine, University of Kansas;
Funding text: This research was funded by the National Science Foundation (NSF) (CCF-1453073, ECCS-1509260), and Research Office (ARO) (W911NF-14-1-0295).
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Data Provider: Engineering Village
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335. Comprehensive optimization of distributed generation considering network reconstruction based on Archimedes optimization algorithm (*Open Access*)

Accession number: 20210910005359

Authors: Li, Yingliang (1); Zhu, Hao (1); Wang, Deming (1); Wang, Kang (1); Kong, Weixu (1); Wu, Xiaomeng (1)
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Volume: 647
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Issue title: 2020 6th International Conference on Advances in Energy Resources and Environment Engineering
Issue date: January 26, 2021
Publication year: 2021
Article number: 012031
Language: English
ISSN: 17551307
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Conference name: 2020 6th International Conference on Advances in Energy Resources and Environment Engineering, ICAESEE 2020
Conference date: November 20, 2020 - November 22, 2020
Conference location: Chongqing, China
Conference code: 167242
Publisher: IOP Publishing Ltd
Abstract: To mitigate the effect of the distributed generation (DG) connection on the voltage profile and power loss, the DG optimal configuration and network reconfiguration are used in distribution automation. In this paper, a new optimization method named Archimedes Optimization Algorithm (AOA) is proposed, unifying the DG optimal configuration and network reconfiguration. The DG locations and capacities are coded by integral and real numbers simultaneously in the proposed method. The integer mesh-network coding method is integrated into the new method to solve the network reconfiguration problem. The new method is compared with the Improved Genetic Algorithm (IGA) as well as the Particle Swarm Optimization (PSO). Results demonstrate that the proposed method has advantages in improving the voltage profile and reducing the power loss. © Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence.
Number of references: 19
Main heading: Distributed power generation
Controlled terms: Genetic algorithms - Network coding - Particle swarm optimization (PSO)
Uncontrolled terms: Comprehensive optimizations - Distribution automation - Network re-configuration - Network reconstruction - Optimization algorithms - Optimization method - Power-losses - Voltage profile
Classification code: 706.1.2 Electric Power Distribution - 716.1 Information Theory and Signal Processing - 723 Computer Software, Data Handling and Applications - 921.5 Optimization Techniques
DOI: 10.1088/1755-1315/647/1/012031
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2020JM-542, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
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336. Effects of Influencing Factors on a Lab-Scale Device for Dynamic Scaling Mitigation

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Authors: Yu, Tao (1, 2); Wang, Ying (1, 2); Song, Jiayu (3); Wu, Baichun (3); Zhang, Xin (1, 2); Qu, Chengtun (1, 2, 3)
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Corresponding author: Qu, Chengtun(xianquct@yeah.net)
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Publication year: 2021
Pages: 750-756
Language: English
ISSN: 12297607
E-ISSN: 20927592
Document type: Journal article (JA)
Publisher: Korean Institute of Electrical and Electronic Material Engineers
Abstract: To investigate the dynamic scaling properties of produced water from oil and gas fields, in this study, an experimental dynamic scaling mitigation device consisting of a filler cylinder, a sewage circulation device, and a heating device was designed. The effects of important factors, namely, initial concentration of scale-forming ions, contact time, temperature, and flow rate, on the dynamic scaling process were investigated using this device. The results obtained showed that the rate of scale adsorption on cotton fiber decreased gradually as the initial concentration of the scale-forming ions increased, and the scale adsorption rate peaked at 97.5% when the contact time was between 2 and 8 h. It was also observed that the maximum scale adsorption rate and amount corresponded to experimental temperatures of 50 and 40 °C, respectively. Furthermore, the maximum scale adsorption rate was 94% at a flow rate of 60 L/h, while the scale adsorption amount peaked at a flow rate of 100 L/h. These results provide important guidelines for the establishment of a rapid measurement method for dynamic scaling in produced water from oil and gas fields and for the evaluation of water quality stability for water flooding extraction. © 2021, The Korean Institute of Electrical and Electronic Material Engineers.
Number of references: 20
Main heading: Gas industry
Controlled terms: Adsorption - Water quality - Flow rate - Produced Water - Quality control - Natural gas fields - Sewage
Uncontrolled terms: Adsorption amounts - Adsorption rates - Experimental dynamics - Initial concentration - Mitigation devices - Oil and gas fields - Rapid measurement - Water quality stabilities
Classification code: 445.2 Water Analysis - 452.1 Sewage - 452.3 Industrial Wastes - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 631 Fluid Flow - 802.3 Chemical Operations - 913.3 Quality Assurance and Control - 943.2 Mechanical Variables Measurements
Numerical data indexing: Percentage 9.40e+01%, Percentage 9.75e+01%, Temperature 3.13e+02K, Temperature 3.23e+02K
DOI: 10.1007/s42341-021-00294-4
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337. Application of Virtual Reality Human-Computer Interaction Technology Based on the Sensor in English Teaching (*Open Access*)

Accession number: 20215011300270
Authors: Jiang, Shuai (1); Wang, Lei (1); Dong, Yuanyuan (2)
Author affiliation: (1) Department of Foreign Languages, Cangzhou Normal University, Cangzhou; 061001, China; (2) School of Foreign Languages, Xian Shiyou University, Xian; 710016, China
Corresponding author: Dong, Yuanyuan(dongyuanyuan0125@xsyu.edu.cn)
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Issue date: 2021
Publication year: 2021
Article number: 2505119
Language: English
ISSN: 1687725X
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Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: In order to improve the online English teaching effect, the paper applies the sensor and human-computer interaction into the English teaching. The paper improves the sensor information by applying Kalman Filter, combines

sensor positioning algorithm to trace the students in the English teaching online, and turns the kernels by the skeleton algorithm into corresponding coordinates of space rectangular coordinate system taking the waist as a coordinate origin to get a human-computer interaction skeleton model in the virtual reality. According to the actual needs of English teaching human-computer interaction, the paper builds a new English teaching system based on the sensor and the human-computer interaction and tests its performance. The experiments suggest that the smart system in the paper can effectively improve English teaching effects. © 2021 Shuai Jiang et al.
Number of references: 21
Main heading: Virtual reality
Controlled terms: Musculoskeletal system - E-learning - Human computer interaction - Teaching
Uncontrolled terms: English teaching - Interaction technology - Positioning algorithms - Rectangular coordinates system - Sensor informations - Sensor positioning - Skeleton models - Teaching effects - Teaching systems - Technology-based
Classification code: 461.3 Biomechanics, Bionics and Biomimetics - 723 Computer Software, Data Handling and Applications
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Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
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338. Research on Information Anxiety of College Students under the Background of Information Overloaded Based on Support Vector Machine Optimization Alogrithm

Accession number: 20221611985394
Authors: Jia, Yanhm (1); Wang, En (2)
Author affiliation: (1) College of Arts and Sciences National, University of Defense Technology, Changsha, China; (2) Sehool of Manxm, Xian Shiyou University, Xian, China
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Conference name: 2nd International Conference on Information Science and Education, ICISE-IE 2021
Conference date: November 26, 2021 - November 28, 2021
Conference location: Virtual, Nanchang, China
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Sponsor: Beijing Boku Yinzhi Information Technology Research Institute; Chinese Representative Office of Christian University of the Philippines; Jiangxi Campus Network; Shenzhen Zhongbo United Talent Development Center
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: With the continuous improvement of Internet technology, people have entered an era of continuous soaring knowledge and information. This era has brought infinite opportunities and challenges. People are exposed to a lot of information every day, such as the numerous information from Tic Toe and Weibo. However, the ability of receiving information of each person is limited. When the amount of received information exceeds his or her ability, information anxiety will arise. If things keep going like this, information anxiety will have a negative impact on the life and study of the college students. Meanwhile, Support Vector Machine (SVM) as one of the machine learning methods is of importance in statistical learning technology Because of its high efficiency, good performance and wide applications in classification, forecasting, and estimation, the SVM has become the most recognized method in learning machines. Therefore, this paper applies the Support Vector Machine optimization algorithm in Matlab language to quantify the relationship between the amount of information received and degree of information anxiety, seeking to find a balance point to help students learn more efficient Through the study of questionnaires, we find the three factors that cause college students information anxiety. We take these three as the independent variables, and the degree of information anxiety as the dependent variable. By the SVM alogrithm, the model between information anxiety, and the amount of information received is created. Then we can calculate the balance point. This paper also analyses the reaction of college students when they are exposed to a large amount of overloaded information, and the main behaviors

of information anxiety. As for how to cope with the information anxiety, the redundant information is filtered through optimization algorithms model in order to provide students with effective information. College students can relief information anxiety through the three aspects of individual, school and society, so that they can actively deal with information overload and alleviate information anxiety. © 2021 IEEE
Number of references: 7
Main heading: Support vector machines
Controlled terms: Information filtering - Optimization - Students - Surveys - Vectors
Uncontrolled terms: Algorithms optimizations - Amount of information - College students - Coping strategies - Exposed to - Information anxiety - Optimization algorithms - Support vector machine optimization algorithm optimization algorithm - Support vectors machine
Classification code: 723 Computer Software, Data Handling and Applications - 903.1 Information Sources and Analysis - 921.1 Algebra - 921.5 Optimization Techniques
DOI: 10.1109/ICISE-IE53922.2021.00117
Funding Details: Number: 21JK0284, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work was supported by the Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 21JK0284).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

339. Research on the Influence of the Internet Technology on the Self-identity of College Students Based on Support Vector Machine Optimization Alogrithm

Accession number: 20221611985387
Authors: Jia, Yanhui (1); Wang, En (2)
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Source title: Proceedings - 2021 2nd International Conference on Information Science and Education, ICISE-IE 2021
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Conference location: Virtual, Nanchang, China
Conference code: 178270
Sponsor: Beijing Boku Yinzhi Information Technology Research Institute; Chinese Representative Office of Christian University of the Philippines; Jiangxi Campus Network; Shenzhen Zhongbo United Talent Development Center
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The college students' self-identity refers to the process of self-exploration and self-affirmation formed. Internet technology has triggered the contradiction between real-world communication based on physical identities and virtual social communication. College students' desire for careness and the "identity absence" in the virtual world are contradictory, causing a crisis of self-identity among college students. Meanwhile, Support Vector Machine (SVM) as one of the machine learning methods is of importance in statistical learning technology. Because of its high efficiency, good performance and wide applications in classification, forecasting, and estimation, the SVM has become the most recognized method in learning machines. Therefore, this paper applies the Support Vector Machine optimization algorithm in Matlab language to quantify the relationship between college students' online time and identity, seeking to find a balance between virtual and real life for college students. Through the study of questionnaires, we find three characteristics of college students' self-identity. We take these three data as the independent variables, and the average hours of weekly online time of college students as the dependent variable. By the SVM alogrithm, the model between self-identity and the hours of the network usage per week is created. Based on this, we can calculate the balance point, which means the healthy self-identity with surfing the Internet. The model shows that 40 hours should be the best hours for college students spending time online per week. Exceeding these hours will have a negative impact

on the self-identity of college students. Also, it is necessary to lead college students to improve their comprehensive ability, and finally overcome the challenge of Internet technology to college students' self-identity. © 2021 IEEE
Number of references: 9
Main heading: Optimization
Controlled terms: Students - Support vector machines - Surveys - Vectors - Virtual reality
Uncontrolled terms: College students - Internet technology - Online time - Optimisations - Optimization algorithms - Self-identity - Student-based - Support vector machine optimization algorithm - Support vectors machine - Virtual networks
Classification code: 723 Computer Software, Data Handling and Applications - 921.1 Algebra - 921.5 Optimization Techniques
Numerical data indexing: Time 1.44E+05s
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Funding Details: Number: 18ZDA027,19CZX018, Acronym: -, Sponsor: -; Number: 21JK0284, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: Acknowledgements This work was supported by the Social Science Foundation of China under Grant (Program Nos. 18ZDA027, 19CZX018), and Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 21JK0284).
Compendex references: YES
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340. Rayleigh Wave Reconstruction from Ambient Noise Cross-Correlation Function by Radon-Wigner Transform (*Open Access*)

Accession number: 20211110078624
Authors: Li, Xinxin (1, 2); Xu, Cheng (3); Shen, Hongyan (1, 2)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'An Shiyou University, Xi'an; 710065, China; (3) CCCC First Highway Consultants Co., Ltd, Xi'an; 710075, China
Source title: IOP Conference Series: Earth and Environmental Science
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Issue title: 9th International Conference on Environmental and Engineering Geophysics
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Article number: 012065
Language: English
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Document type: Conference article (CA)
Conference name: 9th International Conference on Environmental and Engineering Geophysics, ICEEG 2020
Conference date: October 11, 2020 - October 14, 2020
Conference location: Changchun, China
Conference code: 167482
Publisher: IOP Publishing Ltd
Abstract: The ambient noise tomography is a powerful underground-structure-detection method developed in recent years. The key of this technique is to extract Rayleigh-wave signals from cross-correlation functions (CCF). It is important to suppress the noise in Rayleigh wave signals to increase the accuracy of dispersion-curve extraction. In this paper, a Radon-Wigner Transform (RWT) method is used for Rayleigh-wave reconstruction from CCF. We first introduce the principles of RTW, and then use a multi-component synthetic seismic data to show the processing steps of RWT. Finally, we process actual ambient noise CCF with RWT to reconstruct Rayleigh waves. The results of the synthetic and actual data examples indicate that RWT successfully reconstructed the Rayleigh waves from CCF and improved the signal-to-ratio of the signal. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Radon
Controlled terms: Signal processing - Seismology - Underground structures - Rayleigh waves

Uncontrolled terms: Ambient noise tomographies - Cross-correlation function - Dispersion curves - Radon-Wigner transform - Radon-Wigner transform (RWT) - Rayleigh wave signal - Structure detection - Wave reconstruction
Classification code: 408.1 Structural Design, General - 484 Seismology - 484.1 Earthquake Measurements and Analysis - 622.1 Radioactive Materials, General - 716.1 Information Theory and Signal Processing - 804 Chemical Products Generally
DOI: 10.1088/1755-1315/660/1/012065
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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341. Sliding Mode Variable Structure Control of the Steerable Drilling Stabilized Platform Based on Disturbance Observer (*Open Access*)

Accession number: 20212110392495
Authors: Huo, Aiqing (1); Zhang, Shuhan (1); Wu, Shilei (2)
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012033
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: A sliding mode variable structure control based on disturbance observer (SMVSCDOB) has proposed to tackle the uncertainty caused by friction in the stabilized platform on the rotary steerable drilling. Disturbance observer (DOB) is used to estimate the uncertainty in stabilized platform, and the estimated value is compensated by sliding mode variable structure control (SMVSC) to improve the control accuracy. The simulation experiment of control system is carried out with MATLAB, comparing the SMVSCDOB control method with proportional integral derivative (PID), PID+DOB, SMVSC. The simulation results show that the proposed method SMVSCDOB can better track the tool face angle, reduce the system error, suppress the friction interference, and enhance robustness of the system. © Published under licence by IOP Publishing Ltd.
Number of references: 11
Main heading: MATLAB
Controlled terms: Infill drilling - Proportional control systems - Two term control systems - Variable structure control - Friction - Uncertainty analysis
Uncontrolled terms: Control accuracy - Disturbance observer - Friction interference - Proportional integral derivatives - Rotary-steerable drilling - Sliding mode variable structure control - Stabilized platform - Steerable drillings
Classification code: 511.1 Oil Field Production Operations - 723.5 Computer Applications - 731.1 Control Systems - 731.3 Specific Variables Control - 921 Mathematics - 922.1 Probability Theory
DOI: 10.1088/1742-6596/1894/1/012033
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
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342. Effect of twin boundary on mechanical behavior of Cr26Mn20Fe20Co20Ni14 high-entropy alloy by molecular dynamics simulation (*Open Access*)

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Title of translation: Cr26Mn20Fe20Co20Ni14
Authors: Shen, Tian-Zhan (1); Song, Hai-Yang (1); An, Min-Rong (1)
Author affiliation: (1) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
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Publication year: 2021
Article number: 186201
Language: Chinese
ISSN: 10003290
CODEN: WLHPAR
Document type: Journal article (JA)
Publisher: Institute of Physics, Chinese Academy of Sciences
Abstract: The high-entropy alloys break through the traditional alloy structure and present unique and superior mechanical properties. However, the potential deformation mechanism of high-entropy alloy, which is regarded as a new member of alloy families in recent years, needs to be further investigated. In this paper, the mechanical properties of the nano-twin Cr26Mn20Fe20Co20Ni14 high-entropy alloy under tensile loading are studied by molecular dynamics simulation, and the effect of twin boundary on the deformation behavior of nano-twin Cr26Mn20Fe20Co20Ni14 high-entropy alloy is studied on an atomic level. The results show that the yield strength of the nano-twin Cr26Mn20Fe20Co20Ni14 high-entropy alloy increases with twin boundary spacing decreasing, presenting a Hell-Petch relationship. However, there is a critical value of the twin boundary spacing, which makes the sensitivity of the yield strength of the high-entropy alloy to the twin boundary spacing change significantly before and after this value. The results also indicate that the deformation mechanism of nano-twin Cr26Mn20Fe20Co20Ni14 high-entropy alloy changes from dislocation slip to amorphous phase transition with the decrease of twin boundary spacing. The research results of this paper have a certain reference value and guidance significance for designing and preparing high-performance high-entropy alloys. © 2021 Chinese Physical Society.
Number of references: 36
Main heading: Molecular dynamics
Controlled terms: High-entropy alloys - Chromium alloys - Entropy - Yield stress - Iron alloys - Cobalt alloys - Deformation - Manganese alloys
Uncontrolled terms: Alloy structures - Atomic levels - Critical value - Deformation behavior - Deformation mechanism - High entropy alloys - Mechanical behavior - New members - Tensile loading - Twin boundaries
Classification code: 531 Metallurgy and Metallography - 543.1 Chromium and Alloys - 543.2 Manganese and Alloys - 545.2 Iron Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 641.1 Thermodynamics - 801.4 Physical Chemistry - 951 Materials Science
DOI: 10.7498/aps.70.20210324
Funding Details: Number: YCS19211011, Acronym: -, Sponsor: -; Number: YS37020203, Acronym: -, Sponsor: -; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2021JZ-53, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: Project supported by the National Natural Science Foundation of China (Grant No. 11572259), the Natural Science Foundation of Shaanxi Province, China (Grant No. 2021JZ-53), the Provincial Superiority Discipline of Materials Science and Engineering of Xi'an Shiyou University, China (Grant No. YS37020203), and the Program for Graduate Innovation and Practical Ability Cultivation of Xi'an Shiyou University, China (Grant No. YCS19211011)* Project supported by the National Natural Science Foundation of China (Grant No. 11572259), the

Natural Science Foundation of Shaanxi Province, China (Grant No. 2021JZ-53), the Provincial Superiority Discipline of Materials Science and Engineering of Xi'an Shiyou University, China (Grant No. YS37020203), and the Program for Graduate Innovation and Practical Ability Cultivation of Xi'an Shiyou University, China (Grant No. YCS19211011). † Corresponding author. E-mail: hysong@xsyu.edu.cn
Compendex references: YES
Open Access type(s): All Open Access, Gold
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343. Investigation on the application of parabolic reflector in plasma logging source

Accession number: 20213510848001
Authors: Xiaolong, Hao (1); Jing, Zhou (1); Zhenyu, Wang (1); Yifang, Zhang (1)
Author affiliation: (1) Xi'An Shiyou University, National Engineering Laboratory of Petroleum Drilling Technology, Xi'an, China
Corresponding author: Xiaolong, Hao(haoxl315024@163.com)
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Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Issue date: July 23, 2021
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Article number: 9513223
Language: English
ISBN-13: 9781665437158
Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Transmitter source is a significant part of a remote-exploration acoustic logging tool. Its power and directional-radiation characteristics are key factors that affect the tool performance. Plasma source features high power and wide band. Thus, it is expected to significantly improve the exploration depth while maintaining the resolution in remote-exploration logging. However, it cannot generate a directional acoustic field, which seriously undermines its advantages as a logging source. Therefore, exploring a suitable method for directional radiation in a plasma source is necessary. In this study, a two-dimensional axisymmetric formation model with a borehole is developed using the finite-element numerical simulation. The characteristics of the plasma source with a small rotating parabolic reflector in an open hole are simulated, such as the energy accumulation and directional radiation. The simulation results reveal that the parabolic reflector in our model can increase the acoustic pressure by more than 10 dB and narrow the - 3dB angle to approximately 60° in a formation 1 m away from the source. This scheme is primarily verified as a feasible method for directional radiation, which can improve the usefulness of a plasma source in remote-exploration acoustic logging.
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Number of references: 10
Main heading: Reflection
Controlled terms: Plasma sources - Acoustic fields
Uncontrolled terms: Acoustic pressures - Directional radiation - Energy accumulation - Finite element numerical simulation - Parabolic reflector - Remote explorations - Source features - Tool performance
Classification code: 751 Acoustics, Noise. Sound - 932.3 Plasma Physics
Numerical data indexing: Decibel 1.00e+01dB, Decibel 3.00e+00dB, Size 1.00e+00m
DOI: 10.1109/ICMSP53480.2021.9513223
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Compendex references: YES

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Data Provider: Engineering Village
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344. Poly(propylene carbonate) networks with excellent properties: Terpolymerization of carbon dioxide, propylene oxide, and 4,4-(hexafluoroisopropylidene) diphthalic anhydride (*Open Access*)

Accession number: 20213210752569
Authors: Zhang, Yi-Le (1); Wang, Wen-Zhen (1); Wang, Li (1); Li, Lei-Lei (1); Zhang, Kai-Yue (1); Zhao, Sai-Di (1)
Author affiliation: (1) School of Chemistry and Chemical Engineer, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Wen-Zhen(wzwang@xsyu.edu.cn)
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Volume: 21
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Issue date: January 1, 2021
Publication year: 2021
Pages: 511-519
Language: English
E-ISSN: 16187229
Document type: Journal article (JA)
Publisher: Walter de Gruyter GmbH
Abstract: Poly(propylene carbonate) (PPC) is an emerging low-cost biodegradable plastic with potential application in many fields. However, compared with polyolefin plastics, the major limitations of PPC are its poor mechanical and thermal properties. Herein, a thermoplastic PPC containing cross-linked networks, one-pot synthesized by the copolymerization of carbon dioxide, propylene oxide, and 4,4-(hexafluoroisopropylidene) diphthalic anhydride, had excellent thermal and mechanical properties and dimensional stability. The weight-average molecular weight and the polymer yield of the PPC5 were up to 212 kg mol-1 and 104 gpolym gcat-1, respectively. The 5% thermal weight loss temperature reached 320°C, and it could withstand a tensile force of 52 MPa. This cross-linked PPC has excellent properties and is expected to be used under extreme conditions, as the material can withstand strong tension and will not deform. © 2021 Yi-Le Zhang et al., published by De Gruyter.
Number of references: 37
Main heading: Carbon dioxide
Controlled terms: Biodegradable polymers - Carbonation - Copolymerization - Crosslinking - Propylene
Uncontrolled terms: Hexafluoroisopropylidene - Low-costs - Network - Poly(propylene carbonate) - Polypropylene carbonate - Property - Propylene carbonate - Propylene oxide - Terpolymerisation
Classification code: 802.2 Chemical Reactions - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 815.1 Polymeric Materials - 815.2 Polymerization
Numerical data indexing: Mass 2.12E+02kg, Percentage 5.00E+00%, Pressure 5.20E+07Pa, Temperature 5.93E+02K
DOI: 10.1515/epoly-2021-0056
Funding Details: Number: YCS19212064,YSC19113079, Acronym: -, Sponsor: -; Number: 52073228, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JZ-44, Acronym: -, Sponsor: Natural Science Foundation of Shanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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345. Research on the parameter analysis of combined focusing of right Angle cone and projectile (*Open Access*)

Accession number: 20212110398129
Authors: Li, Zhou Li (1); Shi, Kai Kai (1); Qian, Cai Ling (1); Zhang, Qing Bin (1)
Author affiliation: (1) School of Electrical Engineering, Xi'An Shiyou University, XSYU, Xi'an, Shanxi Provience, China

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Part number: 1 of 1
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Publication year: 2021
Article number: 012078
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In a sound wave measurement engineer, a combination focusing device of right angle cone and parabola was designed to increase the emission sound pressure, and by exploring and simulating the relationship between the position and size of the spherical focus area and the height of the right-angled cone, the position of the apex of the right-angled cone, the focal length of the parabolic and other parameters. The analytical relationship between each parameter and the sound pressure level of the spherical area focused at a certain position from the vertex of the right-angled cone is obtained. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Uncontrolled terms: Focal lengths - Focus areas - Focusing device - Parameter analysis - Sound pressure level - Sound pressures - Wave measurement
Classification code: 512.1.1 Oil Fields - 716.1 Information Theory and Signal Processing - 901.1 Engineering Professional Aspects
DOI: 10.1088/1742-6596/1894/1/012078
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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346. Ligand-free copper-catalyzed C(sp3)-H imidation of aromatic and aliphatic methyl sulfides withN-fluorobenzenesulfonimide (*Open Access*)

Accession number: 20211410175022
Authors: Wang, Si-Chang (1); Feng, Ming-Nan (1); Ji, Yue (1); Han, Wei-Wei (1); Ke, Cong-Yu (1); Zhang, Qun-Zheng (1); Zhang, Xun-Li (1)
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Abbreviated source title: RSC Adv.
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Publication year: 2021
Pages: 12136-12140
Language: English
E-ISSN: 20462069
CODEN: RSCACL
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A novel and efficient process has been developed for copper-catalyzed C(sp3)-H direct imidation of methyl sulfides withN-fluorobenzenesulfonimide(NFSI). Without using any ligands, various methyl sulfides including aromatic

and aliphatic methyl sulfides, can be transformed to the correspondingN-((phenylthio)methyl)-benzenesulfonamide derivatives in good to excellent yields. © The Royal Society of Chemistry 2021.
Number of references: 81
Main heading: Ligands
Controlled terms: Catalysis - Sulfur compounds - Aromatic compounds - Copper
Uncontrolled terms: Benzenesulfonamide - Copper catalyzed - Efficient process - Imidation - Ligand-free - Phenylthio
Classification code: 544.1 Copper - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds
DOI: 10.1039/d1ra00686j
Funding Details: Number: 17JF033, Acronym: -, Sponsor: -; Number: 2180011182, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 20JK0830, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2020ZDLSF03-07, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
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Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village
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347. Recent Progress in MOFs-based Sulfur Cathode for Li-S Batteries

Accession number: 20213310771186
Title of translation: -(MOFs)
Authors: Wei, Anke (1); Wang, Lei (1); Wang, Yi (1)
Author affiliation: (1) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Lei(leiw@xsyu.edu.cn)
Source title: Cailiao Daobao/Materials Reports
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Publication year: 2021
Pages: 13052-13057 and 13066
Language: Chinese
ISSN: 1005023X
Document type: Journal article (JA)
Publisher: Cailiao Daobaoshe/ Materials Review
Abstract: With the development of portable electronic devices and electric vehicles, the widely used lithium ion batteries can no longer satisfy the market demand. Lithium sulfur batteries, as a promising high-energy chemical power source, have attracted extensive attention of researchers due to their high theoretical specific capacity (1 675 mAh•g-1) and high theoretical energy density (2 600 Wh•kg-1). However, some of the challenges in the development of lithium-sulfur batteries are inevitable, including the low conductivity of sulfur, large volume changes before and after charge and discharge, poor cycle stability, and the easy dissolution of polysulfide generated. It has been demonstrated that combining sulfur with MOFs-based materials with different structures to build composite cathode materials with a unique microstructure can significantly improve the conductivity, cyclic stability and the dissolution of polysulfide. In this review, the advantages of MOFs as sulfur carriers and recent research progress in MOFs-based sulfur cathode materials are summarized and commented upon based on the principle of lithium-sulfur batteries. Meanwhile, it also gives brief suggestions and outlooks on the future research directions in lithium-sulfur batteries. © 2021, Materials Review Magazine. All right reserved.
Number of references: 92
Main heading: Lithium sulfur batteries
Controlled terms: Electric discharges - Dissolution - Lithium-ion batteries - Cathodes - Metal-Organic Frameworks - Polysulfides
Uncontrolled terms: Charge and discharge - Composite cathode material - Different structure - Future research directions - Low conductivity - Portable electronic devices - Recent researches - Specific capacities

Classification code: 531.1 Metallurgy - 701.1 Electricity: Basic Concepts and Phenomena - 702.1.2 Secondary Batteries - 802.3 Chemical Operations - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 818.2.1 Synthetic Rubber
Numerical data indexing: Specific_Energy 9.36e+06J/kg to 2.20e+01J/kg
DOI: 10.11896/cldb.20040060
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348. Design of online traffic monitoring system based on STM32 and Lora

Accession number: 20213510848033
Authors: Ruirong, Dang (1); Jianyu, Qiao (1)
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Corresponding author: Ruirong, Dang(1061085600@qq.com)
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Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at the problem of on-line measurement of the flow of oil, gas and water multiphase flow in the production process of oil and gas wells, a set of real-time flow monitoring system based on STM32 and Lora was designed. It realizes realtime monitoring and remote control of flow, temperature and pressure in the production process of oil and gas wells. This system selects STM32F103ZET6 as the main control chip, and uses serial communication to form a data acquisition platform by connecting with sensor acquisition modules such as flow, temperature, and pressure. By using Lora wireless communication technology, real-time measurement data is transmitted to the upper computer and transmitted to Cloud Server. It is verified through the built system experiment platform that the system has the advantages of low power consumption, strong real-time performance, low cost and strong reliability. It has great production guiding significance and value for the optimization of oilfield production and the realization of intelligent well completion. © 2021 IEEE.
Number of references: 11
Main heading: Data acquisition
Controlled terms: Remote control - Natural gas wells - Monitoring
Uncontrolled terms: Guiding significances - Intelligent well completion - Low-power consumption - Real time measurements - Real time performance - Serial communications - Temperature and pressures - Wireless communication technology
Classification code: 512.2.1 Natural Gas Fields - 723.2 Data Processing and Image Processing - 731.1 Control Systems
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349. Selective breaking of C-O bonds in hydrodeoxygenation of 4-methylphenol over CoMoS/ZrO2

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Title of translation: CoMoS/ZrO24-C-O
Authors: Li, Zhi-Qin (1); Wang, Ying (1); Yin, Chan-Juan (1); Ren, Xiao-Xiong (1); Qiu, Ze-Gang (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Qiu, Ze-Gang(qiuzegang@xsyu.edu.cn)
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Publisher: Science Press
Abstract: CoMoS/ZrO2 catalysts with different Co-Mo atomic ratios (0.25, 0.30, 0.35, 0.40 and 0.45) and Co-Mo loading amounts (2.35%, 4.36%, 7.48% and 10.79%) were prepared by incipient wetness impregnation. These catalysts were characterized by X-ray diffraction (XRD), temperature-programmed reduction (H2-TPR), nitrogen adsorption/desorption and X-ray photoelectron spectroscopy (XPS). 4-methylphenol was used as model compound for hydrodeoxygenation reaction. The result showed that when the atomic ratio of Co-Mo (Co/Co + Mo) was 0.30 and the Mo loading amount was 4.36%, the highest hydrogenation activity was observed. The conversion of 4-methylphenol was up to 99.86% and the selectivity of main product toluene reached to 87.85%. The formation of CoMoO4 was unfavourable to the formation of toluene. An appropriate interaction between Co-Mo and ZrO2 was required. Copyright ©2021 Editorial Dept. of Journal of Fuel Chemistry and Technology. All rights reserved.
Number of references: 26
Main heading: Zirconia
Controlled terms: Binary alloys - Catalysts - Gas adsorption - Sulfur compounds - Toluene - Transition metals - X ray photoelectron spectroscopy
Uncontrolled terms: 4-methylphenol - Atomic ratio - Breakings - Hydrodeoxygenation - Incipientwetness impregnation - Loading amount - Temperature-programmed reduction - Transition metal sulfides - X- ray diffractions -]+ catalyst
Classification code: 531 Metallurgy and Metallography - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 1.079E+01%, Percentage 2.35E+00%, Percentage 4.36E+00%, Percentage 7.48E+00%, Percentage 8.785E+01%, Percentage 9.986E+01%
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350. Design of arm layered oil recovery data monitoring system (*Open Access*)

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Authors: Huiqin, Jia (1); Cheng, Cheng (1); Ruirong, Dang (1); Gan, Li (1)
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Abstract: Aiming at the different characteristics of different reservoirs between oil wells, this paper studied and designed a layered underground oil recovery data acquisition system based on ARM Cortex-A7 architecture. This system mainly consists of three parts, namely sensor, measurement circuit and data acquisition and processing. I.mx6ull is selected as the main control chip, and a data acquisition platform is built with the peripheral device AD8229 instrument amplifier. The SPI protocol and state machine are used to communicate with the downhole multi-reservoir data, and ESP8266 module is used to transmit the downhole multi-parameter data to the Alibaba Cloud server. Through the software and hardware experiment system test, it shows that the designed system has the characteristics of good real-time performance, high precision and low cost. © Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Data acquisition
Controlled terms: ARM processors - Data handling - Monitoring - Software testing
Uncontrolled terms: Data acquisition system - Data monitoring system - Instrument amplifiers - Measurement circuit - Multi reservoir - Peripheral devices - Real time performance - Software and hardwares
Classification code: 721 Computer Circuits and Logic Elements - 723.2 Data Processing and Image Processing - 723.5 Computer Applications
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351. Formation and diagenetic characteristics of tight sandstones in closed to semi-closed systems: Typical example from the Permian Sulige gas field

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Authors: Wu, Heyuan (1, 2); Zhao, Jingzhou (1, 2); Wu, Weitao (1, 2); Li, Jun (1, 2); Huang, Yanzao (1, 2); Chen, Mengna (3)
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Abstract: In a closed to semi-closed diagenetic environment, the migration efficiency of diagenetic fluid is low, material exchange is weak, and the diagenetic processes of dissolution and cementation differ greatly from those in an open diagenetic environment. Previous research on closed to semi-closed diagenetic systems has focused on the formation mechanism of tight sandstones and the factors that control the formation of high-quality reservoirs. In this study, we obtained data from measured physical properties, petrographic microscope images, scanning electron microscope images, nuclear magnetic resonance, and electronic CT scans from the Permian Sulige gas field, located in the Ordos Basin, North China. We comprehensively analyzed the diagenetic characteristics, diagenetic evolution, compaction mechanism of tight sandstones in closed and semi-closed diagenetic environments, as well as the relationship between compaction and accumulation within this environment. The findings showed that sandstone densification in this area is characterized by multiple stages of siliceous and calcareous cementation. The diagenetic evolution of the Sulige field suggests that the sandstone densification process was not the result of conventional compaction/reduction of porosity and simple cementation, but rather was caused by compaction and quasi-continuous solution-cementation. The migration of organic acids in this process was instrumental for dissolution and pore development, and induced the densification of sandstone. During the dissolution process within the reservoir, the dissolving fluid was retained insitu, thus forming different cements that corresponded to particular periods. We propose that the quasi-continuous dissolution and cementation that occurred during diagenesis was the main cause of densification in the sandstone reservoirs of the Sulige field closed to semi-closed systems. The findings of our study provide a new direction for ongoing research in the field of development of high-quality reservoirs. © 2020 Elsevier B.V.
Number of references: 49
Main heading: Sandstone
Controlled terms: Sedimentology - Densification - Metamorphic rocks - Scanning electron microscopy - Cementing (shafts) - Computerized tomography - Dissolution - Compaction - Tight gas - Gas industry
Uncontrolled terms: Calcareous cementation - Compaction mechanisms - Continuous dissolution - Conventional compaction - Densification process - High quality reservoir - Migration efficiency - Sandstone reservoirs
Classification code: 481.1 Geology - 482.2 Minerals - 512.2 Natural Gas Deposits - 522 Gas Fuels - 723.5 Computer Applications - 802.3 Chemical Operations
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352. 2021 international conference on information technology and big data engineering (*Open Access*)

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Authors: Wei, Wei (1); Han, Jia (2)
Author affiliation: (1) Xi'an University of Technology, China; (2) College of Computer Science, Xi'an Shiyou University, China
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353. Pore Structure of Porous Matrix on Formation and Properties of Gradient Membrane

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Title of translation:
Authors: Liu, Yuan (1); Liu, Zhongjun (1); Ji, Shuai (1); Jing, Yuan (1); Liu, Zhuomeng (1)
Author affiliation: (1) School of Materials Science and Enginneering, Xi'an Shiyou University, Xi'an; 710065, China
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Publisher: Editorial Office of Chinese Journal of Rare Metals
Abstract: Gradient porous material was one kind of porous materials with pore size or porosity gradient along filter thickness directions. During fabrication, the matching between the pore size and pore morphology of the porous substrate and the membrane particle size seriously affected the material properties. The purpose of this research was to study the morphology of porous substrates in order to indicated its influence on the properties of gradient

membranes. This work mentions the different size range (150~250, 58~96 and 2 powder with an average particle size of 2.5 μm was added into alcohol and fully stirred to obtain a stable suspension with a solid content of 5%, the stainless steel matrix was repeatedly immersed in the suspension, and then put into the drying oven for drying, to obtained a uniform thickness film, at the same time used Ar protection at different sintering temperatures (650, 720 and 800) to the preparation of metal-ceramic composite gradient according to different matrix apertures of porous materials. The pore structure and phase composition were characterized and analyzed, respectively. According to XRD result, when the sintering temperature was 650 , the TiO2 film was dominated by Anatase structure, and contained a small amount of Rutile structure. When the sintering temperature rised to 720 , the Anatase type characteristic peak and Rutile type characteristic peak of TiO2 film did not change. When the sintering temperature rised to 800 , most of the Anatase type characteristic peaks of TiO2 film disappeared, and a large number of Rutile type characteristic peaks appeared. The experimental results showed that the TiO2 crystal transition zone existed between 720 and 800 . When the sintering temperature was higher than 800 , most of the Anatase crystal structure is transformed into Rutile crystal structure. SEM images showed that the surface of the matrix material was flat, the pore was large, the porous structure was clear, and there were obvious three-dimensional connected pores. A uniform and defect-free fine porous film layer was formed on the surface of the substrate after the slurry was hung. It was observed that the pore size of the matrix is between 20 and 50 μm, while the particle size of the coated particles was 2.5 μm (median pore size D50). The size difference between the two was too large, which leaded to the TiO2 powder entering the pore channel of the matrix, causing the pore blockage, and seriously affecting the permeability of the porous material. It could be clearly observed from the SEM images that there were a lot of cracks between the TiO2 film and the 316L stainless steel matrix, the size and distribution of cracks were not uniform. These cracks would seriously affect the test of the pore structure and performance of the sample, leading to the inconsistency between the experimental results and the theoretical experimental results. Under the same sintering process conditions, due to the obvious difference in sintering expansion/shrinkage ratio between TiO2 powder and 316L stainless steel matrix, sintering stress would be generated at the interface of the two different materials during sintering and cooling. When the difference value of sintering stress increases to a certain amount, sintering cracking would occur. The permeability tests of the matrix and the gradient material showed that the permeability coefficient of the gradient material prepared by the stainless steel powder matrix with particle size of 150~250 μm decreased by 94.1%. This was because the particle size of coated particles was fixed, and the larger the matrix pore size, the greater the difference between the two, coated particles were more likely to enter the matrix pore, resulting in the sample surface easy to collapse, more serious pore blockage, difficult to form a complete film layer. The conclusion was drawn through the analysis of the experimental data. It was found that the permeability of the gradient porous material was the best, when samples were fabricated under the conditions of matrix pore-size of 15.7 μm, TiO2 particle size of 2.5 μm, and the sintering temperature of 650 . The smaller difference between substrate pore diameter and membrane particle size, the better performance of the gradient porous material was. It was also found that the sintering shrinkage difference between TiO2 membrane and the substrate may derive sintering crack defects on microporous membranes during the sintering process, which affected the performance of the porous material. © Editorial Office of Chinese Journal of Rare Metals. All right reserved.
Number of references: 20
Main heading: Particle size
Controlled terms: Crystal structure - Film preparation - Morphology - Phase composition - Pore size - Suspensions (fluids) - Zirconia - Metal substrates - Porous materials - Powder metals - Grinding (machining) - Oxide minerals - Membranes - Metallic matrix composites - Sintering - Matrix algebra - Titanium dioxide
Uncontrolled terms: 316 L stainless steel - Average particle size - Characteristic peaks - Metal-ceramic composites - Micro porous membranes - Sintering temperatures - Stainless steel powders - Structure and performance
Classification code: 482.2 Minerals - 531 Metallurgy and Metallography - 604.2 Machining Operations - 641.1 Thermodynamics - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 813.2 Coating Materials - 921.1 Algebra - 931.2 Physical Properties of Gases, Liquids and Solids - 933.1.1 Crystal Lattice - 951 Materials Science
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354. Performance of 2-bromoterephthalic acid passivated all-inorganic perovskite cells

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Authors: Lin, Ming-Yue (1); Ju, Bo (1); Li, Yan (1); Chen, Xue-Lian (1)
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Corresponding authors: Li, Yan(yli@xsyu.edu.cn); Chen, Xue-Lian(chenxl@xsyu.edu.cn)
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Publisher: Institute of Physics, Chinese Academy of Sciences
Abstract: All-inorganic perovskite cesium lead iodine (CsPbI3) without any volatile organic components has attracted much attention due to its superior stability, high absorption efficiency and suitable band gap. However, the power-conversion efficiencies of CsPbI3 based perovskite solar cells (PSCs) are substantially low compared with those of the organic-inorganic hybrid lead halide PSCs. The surface passivation of the CsPbI3 film by long-chain halide salts has been found to be an effective method of improving the performance. In this paper, we report the concentration effect of an inexpensive 2-bromoterephthalic acid (BBr) as passivation material on the performance of CsPbI3 perovskite solar cells. The experimental results show that the conversion efficiency of perovskite solar cells first increases and then decreases as the concentration of BBr increases from 0 to 2 mg/mL. The best conversion efficiency of CsPbI3 perovskite solar cells reaches 13.5% at 0.2 mg/mL BBr. The results from X-ray diffraction and scanning electron microscopy suggest that there is no change in the phase or microstructure of the CsPbI3 perovskite film after surface passivation by BBr. By further analyzing the photoluminescence data of the CsPbI3 film with and without capping hole transport layer, it can be found that the passivation of BBr with the concentration of 0.2 mg/mL can enhance the fluorescence excitation intensity of the CsPbI3 film and accelerate the exciton separation at the interface between CsPbI3 film and hole transport layer. Based on the electrochemical impedance spectroscopy data, we find that the electron transport ability at the interface between TiO2 and CsPbI3 can be significantly improved after surface passivation, which is induced by the acceleration of the exciton separation at the interface between CsPbI3 film and hole transport layer. The decrease of the PSCs performance when the concentration of the BBr precursor increases from 0.5 mg/mL to 2 mg/mL can be attributed to the local agglomeration of the BBr material, resulting in the block of charge transportation. This research is expected to provide basic support for the low-cost development of the passivation materials for perovskite solar cells. © 2021 Chinese Physical Society.
Number of references: 24
Main heading: Perovskite solar cells
Controlled terms: Electron transport properties - Hole mobility - Conversion efficiency - Energy gap - Perovskite - Excitons - Lead compounds - organic-inorganic materials - Scanning electron microscopy - Electrochemical impedance spectroscopy - Layered semiconductors - Passivation - Titanium dioxide
Uncontrolled terms: Absorption efficiency - Charge transportation - Fluorescence excitation - Hole transport layers - Organic-inorganic hybrid - Passivation materials - Power conversion efficiencies - Volatile organic components
Classification code: 482.2 Minerals - 525.5 Energy Conversion Issues - 539.2.1 Protection Methods - 702.3 Solar Cells - 712.1 Semiconducting Materials - 801 Chemistry - 804.2 Inorganic Compounds
Numerical data indexing: Mass_Density 0.00e+00kg/m3 to 2.00e+00kg/m3, Mass_Density 2.00e-01kg/m3, Mass_Density 5.00e-01kg/m3 to 2.00e+00kg/m3, Percentage 1.35e+01%
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355. Atomic simulation of interaction mechanism between dislocation and graphene in graphene/aluminum composites

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Abstract: Adjusting the arrangements of embedded graphene in the metal matrix is an important and valid method to improve the mechanical properties of graphene metal-matrix composites. Here, the deformation behavior and mechanical properties of graphene/aluminum composites with inclined graphene sheets under nanoindentation are investigated by molecular dynamics simulation. The results show that graphene has a strong blocking effect on dislocation movement, and the effect is related to the embedding depth of graphene and the lateral gap between graphene. There is a critical depth above which the value of the hardness of the composites increases with the decrease of depth, and under which the value of hardness decreases with the decrease of depth. The variation trend of the hardness of the composites with the embedding depth of graphene is related to the average dislocation density of the composites during plastic deformation. The results also indicate that as the lateral gap between graphene sheets increases, the hardness of the composites decreases. There is also a critical value of lateral gap above which the hardness of the composites suddenly drops sharply. © 2021
Number of references: 49
Main heading: Molecular dynamics
Controlled terms: Nanoindentation - Hardness - Embeddings - Graphene - Metallic matrix composites
Uncontrolled terms: Aluminum composites - Atomic simulations - Dynamics simulation - Embedding depth - Graphene sheets - Graphene/aluminum composite - Mechanical - Metal matrix - Nano indentation - Property
Classification code: 531 Metallurgy and Metallography - 723.4 Artificial Intelligence - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 943.2 Mechanical Variables Measurements - 951 Materials Science
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356. Design of real-time monitoring system for electric submersible pump based on stm32

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Authors: Ruirong, Dang (1); Gan, Li (1)
Author affiliation: (1) Xi'An Shiyou University, Shaanxi Key Laboratory of Drilling Rig Control, Xi'an, China
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Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at the working characteristics and operating environment of electric submersible pumps in oil wells, this paper designs a real-time monitoring system for the working status of electric submersible pumps based on stm32f103. The design is mainly divided into sensor acquisition module, signal processing module, and data display module. The sensor module mainly realizes the collection of vibration, pressure, flow rate, and water content. The parameters collected by the sensor module are matched with the stm32f103 main control chip to effectively process and analyze the data of the four parameters, and transmit the correct data results through the serial port. Finally, 4G DTU wireless transmission is used to send the data to the server and realize the display of the data terminal. The design realizes the remote real-time monitoring of the working status of the submersible pump and the interaction of information and data with the server, which provides a guarantee for the safe operation of the submersible pump unit, and makes the data monitoring of the submersible pump in the working state more intelligent. It is of great significance to the digital and intelligent monitoring of oil wells. © 2021 IEEE.
Number of references: 9
Main heading: Signal processing
Controlled terms: Monitoring - Submersibles - Submersible pumps
Uncontrolled terms: Electric submersible pumps - Intelligent monitoring - Operating environment - Real time monitoring system - Remote real-time monitoring - Sensor acquisition - Submersible pump units - Wireless transmissions
Classification code: 618.2 Pumps - 674.1 Small Marine Craft - 716.1 Information Theory and Signal Processing
DOI: 10.1109/ICMSP53480.2021.9513371
Funding Details: Number: 41874158, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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357. Prediction of Quartz Differential Resonant Accelerometer Zero-bias Based on Long Short Term Memory Neural Networks

Accession number: 20211910343054
Authors: Guanwu, Zhou (1); Qinghong, Zhang (1)
Author affiliation: (1) Xi'an Shiyou University, College of Computer Science, Xi'an, Shaanxi Province; 710065, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: In this paper, a predictive method of zero-bias is proposed for quartz differential resonant accelerometer (QDRA) based on long short-term memory neural networks (LSTM). The stationary and non-linear trend sequence was extracted from nonstationary zero-bias series by stationary processing of time series, then LSTM model was selected for modeling and predicting. Experimental results indicated that the root mean square error (RMSE) was 9.2252e-04, and the short term stability of 0g was improved from 301.3mug to 53.6mug. © 2021 IEEE.
Number of references: 10
Main heading: Long short-term memory
Controlled terms: Accelerometers - Quartz - Brain - Mean square error
Uncontrolled terms: Non-linear trends - Nonstationary - Predictive methods - Resonant accelerometer - Root mean square errors - Short term stability - Zero bias
Classification code: 461.1 Biomedical Engineering - 482.2 Minerals - 922.2 Mathematical Statistics - 943.1 Mechanical Instruments
Numerical data indexing: Mass 0.00e+00kg
DOI: 10.1109/ICSP51882.2021.9408867
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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358. Mechanical behavior of copper-zirconium crystal/amorphous dual-phase nanocomposite based on molecular dynamics simulation

Accession number: 20215111366471
Title of translation: /
Authors: Li, Weiwei (1); Song, Haiyang (1); An, Minrong (1); Han, Ruiqi (1); Ma, Jiali (1)
Author affiliation: (1) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Song, Haiyang(gsfshy@sohu.com)
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Volume: 38
Issue: 12
Issue date: December 2021
Publication year: 2021
Pages: 4239-4246
Language: Chinese
ISSN: 10003851
CODEN: FCXUEC
Document type: Journal article (JA)
Publisher: Beijing University of Aeronautics and Astronautics (BUAA)
Abstract: The wide application of metallic glass is limited by its poor room temperature plasticity. Therefore, improving the mechanical properties of metallic glass and exploring the deformation mechanism of metallic glass have become the research hotspot in the field of materials. The effects of grain size and distribution on the mechanical behavior of dual-phase nanocrystalline/amorphous B2-CuZr/CuZr composites were studied by molecular dynamics method. The results show that with the increase of the size of nanocrystalline particles, the deformation mode of the composites changes from relatively uniform deformation to local deformation of single shear band. The results also indicate that the peak stress of the composites can be effectively increased by increasing the size/volume fraction of nanocrystals, but the plasticity of the composites is not significantly enhanced except for the smaller size nanocrystalline model. In addition, alignment of nanocrystals leads to more severe plastic strain localization than cross alignment. The results of this paper have important reference value and guiding significance for the design and preparation of high-performance metallic glass materials. © 2021, Editorial Office of Acta Materiae Compositae Sinica. All right reserved.
Number of references: 36
Main heading: Molecular dynamics
Controlled terms: Glass - Nanocrystals - Metallic glass - Nanocrystalline alloys - Plasticity - Deformation - Metals
Uncontrolled terms: (metallic) glass - Crystal-amorphous - Deformation mechanism - Dual-phase nanocomposites - Grain distribution - Grainsize - Hotspots - Mechanical behavior - Nanocrystalline particle - Room-temperature plasticity
Classification code: 531 Metallurgy and Metallography - 761 Nanotechnology - 801.4 Physical Chemistry - 812.3 Glass - 933.1 Crystalline Solids - 951 Materials Science
DOI: 10.13801/j.cnki.fhclxb.20210223.001

Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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359. Experimental study on the choice of transducer resonance frequency in downhole flow measurement (*Open Access*)

Accession number: 20212110398108
Authors: Huiqin, Jia (1); Bai, Yongxin (1); Ruirong, Dang (1); Liu, Jingjing (1); Wang, Chengyun (1)
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Corresponding author: Ruirong, Dang(1061085600@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1894
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012057
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ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In the process of downhole layered oil recovery, it is necessary to measure the liquid production of each layer in real time, so as to control the oil production plan of each layer in real time according to the oil production plan. Need to use ultrasonic time difference flowmeter to measure the flow in the process of injection and production. Due to the complex and changeable downhole environment, impurities such as sand and bubbles often appear in the process of downhole flow measurement. How to choose a suitable ultrasonic transducer frequency is of great significance to the flow measurement results. At present, common transducer resonance frequencies on the market mainly include 1MHz, 500KHz, 180KHz, and 40KHz. In this paper, the attenuation characteristics of the resonant signal of the transducer in the medium containing impurities are studied through simulation and experiment. The experimental data shows that in the stratified oil recovery system, the receiving effect of the system is best when the transducer frequency is 1MHz. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Flow measurement
Controlled terms: Production control - Oil well flooding - Ultrasonic transducers - Planning - Flowmeters - Natural frequencies
Uncontrolled terms: Attenuation characteristics - Oil production - Oil recoveries - Oil recovery systems - Real time - Resonant signal - Time-differences - Transducer resonance
Classification code: 511.1 Oil Field Production Operations - 631.1 Fluid Flow, General - 753.2 Ultrasonic Devices - 912.2 Management - 913.2 Production Control - 943.1 Mechanical Instruments - 943.2 Mechanical Variables Measurements
Numerical data indexing: Frequency 1.00e+06Hz
DOI: 10.1088/1742-6596/1894/1/012057
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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360. Research on multiphase flow measurement system based on electromagnetic correlation method (*Open Access*)

Accession number: 20212110392510
Authors: Huiqin, Jia (1); Hangchao, Wang (1); Ruirong, Dang (1); Jianyu, Qiao (1)
Author affiliation: (1) Shaanxi Key Laboratory of Drilling Rig Control, Xi'An Shiyou University, Xi'an, China
Corresponding author: Ruirong, Dang(1061085600@qq.com)
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Article number: 012048
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: The phenomenon of oil-gas-water multiphase flow is common in oil Wells in the middle and late stage of oil field development. The accurate measurement of its flow is of great significance to the control of oil production process and the efficient development of oil fields. In the analysis and research on the existing problems of multiphase flow measurement technology at home and abroad and based on the proposed a flow measurement system based on conductance measurement technique design and the implementation plan, to achieve a kind of can expand production logging in multiphase flow of oil and gas flow measurement range, and with continuous measurement, no radioactive, low cost advantages, such as oil and gas water related method of flow measurement model of multiphase flow electromagnetic research, optimization of oilfield production and realization of intelligent well completion, and promote the development of new type multiphase flow instrument, with major production guiding significance and value. © Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Oil field development
Controlled terms: Oil well completion - Oil well logging - Multiphase flow - Flow of gases - Flow measurement - Oil well production - Flowmeters
Uncontrolled terms: Accurate measurement - Conductance measurement - Continuous measurements - Electromagnetic research - Guiding significances - Intelligent well completion - Multi-phase flow measurements - Oilfield production
Classification code: 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 631.1.2 Gas Dynamics - 943.1 Mechanical Instruments - 943.2 Mechanical Variables Measurements
DOI: 10.1088/1742-6596/1894/1/012048
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Open Access type(s): All Open Access, Bronze
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361. Research on the time-domain response characteristics of RLC resonant circuit based on magnetostrictive transducer under sinusoidal excitation

Accession number: 20213510848015
Authors: Li, Zhou Li (1); Zhang, Qing Bin (1); Zhang, Jia Tian (1); Shi, Kai Kai (1)
Author affiliation: (1) School of Electrical Engineering, Xi'An Shiyou University, XSYU, Shanxi Provience, Xi'an, China
Corresponding author: Zhang, Qing Bin(960568502@qq.com)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Publication year: 2021
Pages: 204-209
Article number: 9513337
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Submerged arc furnace, also known as electric arc furnace or resistance electric furnace, it is an industrial electric furnace with continuous operation and huge power consumption. It is mainly used for smelting calcium carbide, industrial silicon, ferrosilicon, silicomanganese, ferronickel, ferrochrome and other important modern industries. In order to solve the problems of the accuracy of length measurement in the submerged arc furnace and the difficulty of the upper computer to collect and process the acoustic signal, In this paper, the loss characteristics and propagation characteristics of the ultrasonic in the submerged arc furnace and the time-domain response characteristics of the RLC resonant circuit based on the magnetostrictive transducer under the excitation of the sinusoidal signal are optimized. The study found that in the under-damped response, the time for the magnetostrictive transducer RLC resonant circuit to reach the steady-state response has an exponential relationship with the external resistance of the resonant circuit. In other words, a suitable external resistance can be selected under the under-damped response. The external resistance value not only ensures that the time for the current to reach a steady state is less than 200us, but also ensures that the impedance of the loop is small enough to obtain a current that meets the requirements. © 2021 IEEE.
Number of references: 7
Main heading: Resonant circuits
Controlled terms: Time domain analysis - Ferroalloys - Electric furnaces - Magnetostrictive devices - Slags - Transducers - Electric arcs - Timing circuits
Uncontrolled terms: Continuous operation - Electric arc furnace - Loss characteristics - Magnetostrictive transducers - Propagation characteristics - Sinusoidal excitations - Steady-state response - Submerged arc furnace
Classification code: 545.2 Iron Alloys - 701.1 Electricity: Basic Concepts and Phenomena - 713.4 Pulse Circuits - 921 Mathematics
DOI: 10.1109/ICMSP53480.2021.9513337
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Compendex references: YES
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362. Construction of Mobile E-Commerce Platform and Analysis of Its Impact on E-Commerce Logistics Customer Satisfaction (*Open Access*)

Accession number: 20210909990545
Authors: Dong, Zhonghui (1)
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Corresponding author: Dong, Zhonghui(zhdong@xsyu.edu.cn)
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Volume: 2021
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Publication year: 2021
Article number: 6636415
Language: English
ISSN: 10762787
E-ISSN: 10990526
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: With the development of mobile network communication technology, online shopping has further become the mainstream way of mass consumption. To this end, this article attempts to start from the innovation of e-commerce platform, uses today's Internet of Things, collects relevant information, and collects relevant data through smart sensors, to establish a mobile e-commerce platform and analyze and explore the impact of e-commerce logistics customer satisfaction of factors revolve around e-commerce logistics. This article uses smart sensor technology to mine and analyze e-commerce information data and then design and build a new mobile e-commerce platform. Taking the two major e-commerce platforms of Jingdong and Taobao as examples, through online evaluation surveys, the importance of factors affecting logistics service quality and customer satisfaction under different logistics distribution models was explored and analyzed. Under JD's selfoperated logistics distribution model, users pay the most attention to the integrity of the delivered goods, the accuracy of the delivery time, and the service attitude of the delivery personnel. The importance is ranked second, first, and third, reaching 48.36%, 50.36%, and 61.64%, respectively. Under the third-party logistics distribution model of Taobao, the main influencing factors are the integrity of the delivered goods, the accuracy of the delivery time, the importance of outer packaging, and the importance of product integrity, reaching 37.52%, 41.1%, and 24.29 %, respectively. © 2021 Zhonghui Dong.
Number of references: 24
Main heading: Customer satisfaction
Controlled terms: Mobile commerce - Quality control - Outsourcing - Sales
Uncontrolled terms: Logistics distribution - Logistics service qualities - Mobile e-commerce - Network communications - On-line evaluation - Product integrity - Smart sensor technology - Third party logistics
Classification code: 723.5 Computer Applications - 911.4 Marketing - 912.2 Management - 913.3 Quality Assurance and Control
Numerical data indexing: Percentage 2.43e+01%, Percentage 3.75e+01%, Percentage 4.11e+01%, Percentage 4.84e+01%, Percentage 5.04e+01%, Percentage 6.16e+01%
DOI: 10.1155/2021/6636415
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

363. Design of Online Marketing System Based on Multi-Data Model Fusion and Intrusion Detection

Accession number: 20220411507133
Authors: Yuan, Jing (1)
Author affiliation: (1) School of Economics and Management of xi'An Shiyou Univercity, Xian; 710065, China
Corresponding author: Yuan, Jing(yuanjingxasyuni@sohu.com)
Source title: Proceedings - 2nd International Conference on Smart Electronics and Communication, ICOSEC 2021
Abbreviated source title: Proc. - Int. Conf. Smart Electron. Commun., ICOSEC
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Publication year: 2021
Pages: 363-366
Language: English
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Conference name: 2nd International Conference on Smart Electronics and Communication, ICOSEC 2021

Conference date: September 7, 2021 - September 9, 2021
Conference location: Trichy, India
Conference code: 174000
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The online marketing system, as an emerging network marketing method, has been developed rapidly with the combination of data mining and analytic models recenrly. This paper designs an online marketing system based on multi-data model fusion and anomaly detection. First, this article introduces the current research status of multi-data model fusion, model classification, and their respective advantages and disadvantages. Then, a platform-based anomaly detection algorithm is designed with a fusion anomaly detection model. Finally, the use of multi-data fusion and anomaly detection model design line on the marketing system. © 2021 IEEE.
Number of references: 24
Main heading: Intrusion detection
Controlled terms: Data mining - Data fusion - Marketing - Anomaly detection
Uncontrolled terms: Analytic modeling - Anomaly detection models - Data mining models - Intrusion-Detection - Model fusion - Multi-data model - Multi-datum - Network marketing - Online marketing - Online marketing system
Classification code: 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 911.4 Marketing
DOI: 10.1109/ICOSEC51865.2021.9591803
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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364. Characterization of Ni/N- r GO catalyst and study on the hydrogenation performance of phenol

Accession number: 20213310771164
Title of translation: Ni/N- r GO
Authors: Xu, Hai-Sheng (1); Huang, Guo-Qiang (1); Xue, Mei-Yue (1); Gao, Peng-Cheng (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Xu, Hai-Sheng(xhs74@xsyu.edu.cn)
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Abbreviated source title: Ranliao Huaxue Xuebao J. Fuel Chem. Technol.
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Issue: 7
Issue date: July 2021
Publication year: 2021
Pages: 1042-1048
Language: Chinese
ISSN: 2097213X
E-ISSN: 18725813
CODEN: RHXUD8
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Using 325 mesh flake graphite as raw material, graphite oxide (GO) was synthesized by improved Hummers method. Nitrogen-doped reduced graphene oxide (N- r GO) carrier was prepared by hydrothermal method using urea as nitrogen source, and then supported Ni/N- r GO catalyst was prepared by impregnation method. The prepared catalysts were characterized and analyzed by N2 adsorption-desorption, XRD, SEM, H2-TPR and other methods. The hydrogenation performance of Ni catalysts supported by N- r GO, reduced graphene oxide (r GO) and activated carbon (AC) were compared under the reaction conditions of 150 , 0.4 MPa and 2.0 h with selective hydrogenation of phenol to cyclohexanone as probe reaction. The results show that the N- r GO support not only has a large specific surface area and suitable pore structure, but also has good synergistic effect with nickel metal, and the Ni/N- r GO catalyst thus shows excellent catalytic activity and selectivity. © 2021, Science Press. All right reserved.
Number of references: 26
Main heading: Catalyst selectivity
Controlled terms: Activated carbon - Catalyst activity - Catalyst supports - Doping (additives) - Graphene oxide - Graphite - Hydrogenation - Phenols - Pore structure - Urea
Uncontrolled terms: Catalytic hydrogenation - Cyclohexanones - Flake graphite - Graphite oxide - Nitrogen-doped - Nitrogen-doped reduced graphene oxide carrier - Oxides catalysts - Performance - Reaction mechanism - Reduced graphene oxides

Classification code: 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Pressure 4.00E+05Pa, Time 7.20E+03s
DOI: 10.1016/S1872-5813(21)60038-5
Funding Details: Number: YCS20212102,YCS20221009, Acronym: -, Sponsor: -;
Funding text: Received2020-12-30Revised2021-01-26 * Corresponding author. E-mail: xhs74@xsyu.edu.cn. The project was supported by University Graduate Innovation and Practical Ability Training Project of Xi' an Shiyou University (YCS20221009 YCS20212102). YCS20221009YCS20212102 Elsevier ScienceDirect (http://www.sciencedirect.com/science/journal/18725813)The project was supported by University Graduate Innovation and Practical Ability Training Project of Xi'an Shiyou University (YCS20221009, YCS20212102)
Compendex references: YES
Database: Compendex
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365. Research progress on demulsification of petroleum Pickering emulsion by molecular oxidation, photocatalytic oxidation and electrochemical oxidation

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Title of translation: Pickering
Authors: Su, Biyun (1); Ran, Liangtao (1); Hu, Yahe (1); Zhang, Ao (1); Han, Qiaoqiao (1); Wu, Jindi (1); Liu, Yiting (1); Meng, Zuchao (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Su, Biyun(subiyun@xsyu.edu.cn)
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Issue date: July 5, 2021
Publication year: 2021
Pages: 3995-4002
Language: Chinese
ISSN: 10006613
Document type: Journal article (JA)
Publisher: Materials China
Abstract: Complex working conditions is often encountered in petroleum exploitation, gathering and processing. Natural surfactants are mixed with artificial emulsifier and nano-micron solid particles to form petroleum pickering emulsion, which makes the oil-water system in a stable state of O/W, W/O or multiple emulsification. Oil-water emulsion is the main product of water flood recovery, and its efficient demulsification is a common demand in the petroleum industry chain. At present, petroleum industry still adopts the demulsification method for common oil-water emulsion. But for the complex oil-water emulsion, the oxidative demulsification aiming at removing the film-forming emulsifier is better than the traditional demulsification. In view of this, based on the efficient oxidative demulsification mechanism, this paper introduced the characteristics and negative effects of petroleum pickering emulsion. Compared with the traditional chemical demulsification method without oxidation reaction, the demulsification progress of molecular oxidation, photocatalytic oxidation and electrochemical oxidation for oil-water emulsions with different sources and characteristics were reviewed. For each method, the process mechanism, application examples, advantages and disadvantages were analyzed in detail. Finally the limitations of these oxidation methods were summarized and prospected to realize the accurate demulsification of petroleum pickering emulsion in the future. © 2021, Chemical Industry Press Co., Ltd. All right reserved.
Number of references: 38
Main heading: Surface active agents
Controlled terms: Emulsions - Electrochemistry - Electrochemical oxidation - Demulsification - Emulsification - Petroleum industry - Gasoline - Ostwald ripening
Uncontrolled terms: Application examples - Molecular oxidation - Natural surfactants - Oil-water emulsion - Oxidation reactions - Photocatalytic oxidations - Pickering emulsions - Process mechanisms
Classification code: 523 Liquid Fuels - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
DOI: 10.16085/j.issn.1000-6613.2020-1674
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village
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366. Biotreatment of oil sludge containing hydrocarbons by Proteus mirabilis SB

Accession number: 20212310455394
Authors: Ke, Cong-Yu (1); Chen, Li-Yang (1); Qin, Fang-Ling (1); Sun, Wu-Juan (1); Wang, Si-Chang (1); Zhang, Qun-Zheng (1); Zhang, Xun-Li (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Zhang, Xun-Li(xlzhang@xsyu.edu.cn)
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Abbreviated source title: Environ. Technol. Innov.
Volume: 23
Issue date: August 2021
Publication year: 2021
Article number: 101654
Language: English
E-ISSN: 23521864
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: The release of petroleum hydrocarbons in the form of oil sludge poses a serious threat to people and the environment. At present, biodegradation of oily sludge is regarded as one of the most promising harmless treatment technologies, where the screening of high efficient degrading strains is the key to its implementation. In the present study, a strain Proteus mirabilis SB was isolated from oil sludge of Jingbian Oil Field. The strain grew and reproduced rapidly with petroleum hydrocarbon as the sole carbon source in the optimal growth temperature range of 30–35 °C, and salinity less than 6%. Its effective emulsification function was attributed to the production of biosurfactants, mainly rhamnolipids, through metabolism. Analysized by gas chromatography (GC) and four-fraction the degradation efficiency of total petroleum hydrocarbon (TPH) reached 70.5% within 2 weeks in the liquid culture medium, while the degradation efficiencies of saturated hydrocarbons, aromatics, resins and asphaltenes were 90.8%, 69.2%, 16.3% and 31.5%, respectively. For degrading petroleum hydrocarbons in oil sludge within a quasi-solid culture system under standard atmospheric conditions, a total degradation efficiency of 76.9% over 60 days was obtained, while 90.8% of saturated hydrocarbons and 69.2% of aromatics were degraded. Overall, the strain was capable of degrading petroleum hydrocarbons in both crude oil and oil sludge with high efficiencies This development demonstrated strong potential of Proteus mirabilis SB for oil sludge treatment and in situ bioremediation of crude oil contaminated soil/land.
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Number of references: 54
Main heading: Crude oil
Controlled terms: Biodegradation - Soils - Emulsification - Strain - Bioremediation - Soil pollution - Degradation - Efficiency - Hydrocarbons - Mineral oils - Surface active agents - Aromatization - Gas chromatography - Gasoline - Oil fields
Uncontrolled terms: Atmospheric conditions - Crude oil-contaminated soils - Degradation efficiency - Harmless treatments - In-situ bioremediation - Petroleum hydrocarbons - Saturated hydrocarbons - Total petroleum hydrocarbons
Classification code: 454.2 Environmental Impact and Protection - 461.8 Biotechnology - 483.1 Soils and Soil Mechanics - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 513.3 Petroleum Products - 523 Liquid Fuels - 801.2 Biochemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 913.1 Production Engineering - 951 Materials Science
Numerical data indexing: Age 1.64e-01yr, Age 3.84e-02yr, Percentage 1.63e+01%, Percentage 3.15e+01%, Percentage 6.00e+00%, Percentage 6.92e+01%, Percentage 7.05e+01%, Percentage 7.69e+01%, Percentage 9.08e+01%
DOI: 10.1016/j.eti.2021.101654
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367. A strategy for improving mechanical properties of metallic glass by tailoring interface structure

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Authors: Ma, J.L. (1); Song, H.Y. (1); An, M.R. (1); Li, W.W. (1); Han, R.Q. (1)
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Language: English
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Abstract: The strength-plasticity trade-off of the metallic glass (MG) is a topical issue that researchers are constantly pursuing. Controlling the glass/glass interface (GGI) structure has become a key avenue for advancing MG performance. Here, the effect of the Cu composition in the boundary region (BR) (i.e., GGI structure) on the mechanical properties of the Cu85Zr15/CuxZr100-x dual-phase nanoglass (DPNG) under tensile loading is investigated by molecular dynamics simulation method. The results indicate that the strength of the DPNG can be significantly improved while its excellent plasticity is maintained by adjusting the Cu composition in the BR. The results also show that the mechanical properties of the DPNGs are not only related to the strength of the BR and the grain region (GR), but also to the GGI structure. The optimal matching relationship between the GR and the BR is obtained. The results will present a theoretical basis for developing the high-performance DPNG. © 2020 Elsevier B.V.
Number of references: 49
Main heading: Molecular dynamics
Controlled terms: Plasticity - Structural optimization - Economic and social effects - Glass - Metallic glass
Uncontrolled terms: Boundary regions - Dual phase - Interface structures - Molecular dynamics simulation methods - Optimal matching - Tensile loading - Trade off
Classification code: 531 Metallurgy and Metallography - 801.4 Physical Chemistry - 812.3 Glass - 921.5 Optimization Techniques - 951 Materials Science - 971 Social Sciences
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368. Copolymerization of CO2, propylene oxide, and itaconic anhydride with double metal cyanide complex catalyst to form crosslinked polypropylene carbonate

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Authors: Luo, Liang (1); Wang, Wen-Zhen (1); Wang, Li (1); Li, Lei-Lei (1); Zhang, Yi-Le (1); Zhao, Sai-Di (1)
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Publisher: Walter de Gruyter GmbH
Abstract: In this study, a high-activity Zn-Co double metal cyanide complex was synthesized and used to catalyze the ternary polymerization of carbon dioxide, propylene oxide, and itaconic anhydride to produce a new class of polypropylene carbonates characterized by excellent performance and low ether content. The number average molecular weight of the terpolymer was as high as 2.14 × 105 g·mol-1, and the polydispersity index was as high as 1.58. In the case of PPCIAn3, the 5% weight loss temperature increased by 70°C, the total weight loss temperature increased by 100°C, the tensile strength increased by 6.6 MPa, and the elongation at break decreased to 14.5% with respect to traditional polypropylene carbonate. The apparent efficiency of the catalyst was as high as 45.79 gpolymer/gcatalyst, indicating its high catalytic activity. 1H-NMR spectrometry, gel permeation chromatography, differential scanning calorimetry, thermogravimetric analysis, and in situ Fourier-transform infrared spectroscopy were used to characterize the polymerization process and the structural properties of the obtained terpolymers. © 2021 Liang Luo et al., published by De Gruyter.
Number of references: 45
Main heading: Sustainable chemistry
Controlled terms: Binary alloys - Carbon dioxide - Catalyst activity - Cobalt alloys - Cobalt compounds - Copolymerization - Crosslinking - Cyanides - Differential scanning calorimetry - Fourier transform infrared spectroscopy - Gel permeation chromatography - Polypropylenes - Propylene - Tensile strength - Zinc alloys
Uncontrolled terms: Copolymerisation - Double metal cyanide complex - Double metal cyanides - Green-chemistry - Itaconic anhydrides - Metal cyanide complexes - Polypropylene carbonate - Propylene oxide - Ternary copolymerization - Terpolymerisation
Classification code: 546.3 Zinc and Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 801 Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 815.1.1 Organic Polymers - 815.2 Polymerization - 944.6 Temperature Measurements
Numerical data indexing: Inductance 1.00E00H, Molar mass 1.05E+02g/mol, Percentage 1.45E+01%, Percentage 5.00E+00%, Pressure 6.60E+06Pa, Temperature 3.43E+02K, Temperature 3.73E+02K
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369. Paper-based filter membrane for high-efficient sampling and direct mass spectrometric analysis of siloxanes in outdoor air

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Authors: Niu, Zhifeng (1); Shi, Jun (1); Xu, Zeru (1); Zheng, Yajun (1); Xiang, Zhicheng (1); Zhao, Jia (1); Zhang, Zhiping (1)
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Publisher: Elsevier Ltd
Abstract: Siloxanes have been found widespread usages in our daily lives, but the knowledge on their migration, transformation and toxicity is still limited. Herein we explored the feasibility of using one-sided silica coated paper as filter membrane to capture siloxanes in the outdoor air, followed by direct mass spectrometric analysis. In contrast to mostly utilized fiber membrane, silica coated paper not only exhibited a higher selective sampling efficiency to three siloxanes with structures of H–[Si(CH3)2–O]7-9-NH2 from air, but also possessed a high tolerance to organic solvent during mass spectrometric analysis. Due to the above features, the analysis sensitivity of those siloxanes with silica coated paper has been improved 3.1–134.8 folds in contrast to those with commercial filter membrane. Furthermore, we monitored variation in the levels of those siloxanes for a period of one month, and found that a close association (R2 = 0.7924–0.9559) existed between their contents and climate parameters (e.g., temperature, weather, atmospheric pressure, humidity, wind direction and wind speed) as well as sampling volume. These knowledge provides a facile and effective methodology to both high-efficient sampling siloxanes and environmental assessment of siloxanes according to climate parameters. © 2021 Elsevier Ltd
Number of references: 50
Main heading: Atmospheric pressure
Controlled terms: Sensitivity analysis - Silica - Wind - Membranes - Silicon - Mass spectrometry - Paper - Atmospheric humidity
Uncontrolled terms: Climate parameters - Coated paper - Efficient sampling - Filter membrane - High efficient - Mass spectrometric analysis - Outdoor air - Silica coated - Silicum coated paper - Siloxane
Classification code: 443.1 Atmospheric Properties - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 801 Chemistry - 811.1 Pulp and Paper - 921 Mathematics - 951 Materials Science
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370. Research and analysis of sensor performance in gas well flow measurement

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Authors: Dang, Ruirong (1); Liu, Jingjing (1); Tian, Menglin (1); Zhe, Ma (1)
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Abstract: In all links of natural gas supply, storage and marketing, accurate measurement of flow is one of the most critical links. Due to the high requirements of gas flow measurement for the flow meter measurement system, not only high accuracy of the flow meter measurement is required, but also higher requirements for the measuring sensor. Therefore, this paper mainly studies the influence of sensor structure design and sensor drive waveform on the signal sent and received by the gas flowmeter in the process of natural gas supply. Through the analysis and research of the ultrasonic attenuation theory, the conclusion that the performance of the oblique probe sensor is better is obtained. And by analyzing the experimental data, it is verified that the sensor effect of the oblique probe driven by the pulse waveform in the driving circuit is the best. © 2021 IEEE.
Number of references: 12
Main heading: Flow measurement
Controlled terms: Natural gas wells - Flow of gases - Gas supply - Gases - Digital storage - Flowmeters - Probes - Calibration
Uncontrolled terms: Accurate measurement - Driving circuits - Measurement system - Pulse waveforms - Research and analysis - Sensor performance - Sensor structures - Ultrasonic attenuation
Classification code: 512.2.1 Natural Gas Fields - 522 Gas Fuels - 631.1 Fluid Flow, General - 631.1.2 Gas Dynamics - 722.1 Data Storage, Equipment and Techniques - 943.1 Mechanical Instruments - 943.2 Mechanical Variables Measurements
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371. Exploration of the Soft Ionization Performance of Paper Spray Mass Spectrometry

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Authors: Xu, Ze-Ru (1); Zhao, Jia (1); Zheng, Ya-Jun (1); Niu, Zhi-Feng (1); Xiang, Zhi-Cheng (1); Zhang, Zhi-Ping (1)
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Corresponding author: Zhang, Zhi-Ping
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Document type: Journal article (JA)
Publisher: Chinese Society for Mass Spectrometry
Abstract: Paper spray mass spectrometry has received considerable attentions in recent years due to its simple operation, low cost and without tedious sample pretreatment prior to analysis. However, paper spray ionization (PSI) as a type of electrospray-based ionization source, there are few reports on exploring the ionization performance

differences between it and two frequently used electrospray ionization (ESI) and nanoelectrospray ionization (nanoESI). Herein the ionization performance of above three ionization sources was compared systematically by using gasolines, myoglobin, cytochrome c and glycidyl azide polymer (GAP) as samples. According to the obtained results, the ionization performance demonstrated the following trend: PSIave) from PSI were lower than those from ESI and nanoESI. As an example for myoglobin, the Zave value was 18.07±0.01 for PSI, whereas the corresponding values were 19.47±0.01 (ESI) and 19.67±0.01 (nanoESI) in comparable experimental conditions (n=3), respectively. When cytochrome c was used for analysis, the Zave values were 14.14±0.17 (PSI), 14.44±0.13 (ESI) and 14.67±0.01 (nanoESI), respectively. As GAP sample was analyzed using PSI, it was more favorable to maintain the structures of intact GAP, and both the number-average molecular weight (Mn) and weight-average molecular weight (Mw) had higher values. For both ESI and nanoESI, lower values of Mn and Mw were obtained. These results provided confident evidences that the performance of PSI was much softer in ionizing different types of compounds than those of ESI and nanoESI. The investigation on the performance of various ionization sources can provide important references for deep understanding of the ionization performance of PSI, ESI and nanoESI as well as broadening the application of PSI source. © 2021, Editorial Board of Journal of Chinese Mass Spectrometry Society. All right reserved.
Number of references: 39
Main heading: Electrospray ionization
Controlled terms: Ionization of gases - Mass spectrometry - Proteins - Mass spectrometers - Gasoline - Molecular weight
Uncontrolled terms: Cytochrome c - Glycidyl azide polymer - Ionisation sources - Ionization performance - Mass spectrometric analysis - Nanoelectrospray ionization - Paper spray - Performance - Soft ionization - Spray ionization
Classification code: 523 Liquid Fuels - 801 Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics
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372. Simulation of interaction behavior between dislocation and graphene during nanoindentation of graphene/aluminum matrix nanocomposites (*Open Access*)

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Title of translation: /
Authors: Han, Rui-Qi (1); Song, Hai-Yang (1); An, Min-Rong (1); Li, Wei-Wei (1); Ma, Jia-Li (1)
Author affiliation: (1) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding authors: Song, Hai-Yang(hysong@xsyu.edu.cn); An, Min-Rong(amr_lr@126.com)
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Article number: 066201
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Document type: Journal article (JA)
Publisher: Institute of Physics, Chinese Academy of Sciences
Abstract: Graphene has been thought to be an ideal reinforcement material for metal matrix composite due to its superior mechanical properties and unique two-dimensional geometry. However, the deformation mechanism of graphene/aluminum matrix composite is still unclear. In this paper, molecular dynamics simulation is used to elucidate the evolution details of the dislocation microstructure and the underlying interaction behavior between dislocation and graphene during nanoindentation of the graphene/aluminum matrix composite with various graphene orientations. To this end, four different cases, i.e. the pure aluminum and the graphene/aluminum matrix composite with the graphene orientation of 90°, 45° and 0° are examined, respectively. Based on the force-indentation depth curve, the interaction behavior between dislocation and graphene and its effect on the plastic zone are analyzed. The results indicate that the graphene can act as an effective dislocation motion barrier, and the elastic deformation of graphene can occur locally along the direction of dislocation slip. Using the visualization technique of dislocation extraction algorithm, the nucleation and propagation of dislocation are investigated. The results show that the differences in interaction

behavior between dislocation and graphene with various orientations affect the spreading trend of the plastic zone and the blocking strength of graphene to dislocation. For the composite with the graphene orientations of 45° and 0°, the interaction between graphene and dislocation causes the number of dislocations to increase. Additionally, the plastic zone of the composite with the graphene orientation of 45° is tangent to two symmetrical graphene sheets. For the composite with the graphene orientation of 90°, the interaction between graphene and dislocation shortens the total length of the dislocation line, and the volume shrinkage of plastic zone is most significant after indenter retraction. Here, the hardness is also calculated to quantitatively evaluate the influence of graphene orientation on the mechanical properties of graphene/aluminum matrix composite. The hardness of the composite with the graphene orientation of 45° is highest, which is due to the decrease of the volume of the plastic zone and the increase of dislocation number. The decrease of the hardness of the composite with the graphene orientation of 90° is attributed to the reduction of dislocation number in the plastic zone. However, for the composite with the graphene orientation of 0°, the interaction between graphene and dislocation results in the softening effect, because of a wide range of elastic deformation in the graphene plane. The study can provide a certain theoretical guidance for designing and preparing the high-performance graphene/metal matrix composites. © 2021 Chinese Physical Society.
Number of references: 36
Main heading: Molecular dynamics
Controlled terms: Hardness - Plastic deformation - Metallic matrix composites - Graphene - Nanoindentation - Polymer matrix composites - Elastic deformation - Matrix algebra
Uncontrolled terms: Deformation mechanism - Dislocation microstructures - Extraction algorithms - Interaction behavior - Molecular dynamics simulations - Reinforcement materials - Two-dimensional geometry - Visualization technique
Classification code: 531 Metallurgy and Metallography - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 815.1 Polymeric Materials - 921.1 Algebra - 943.2 Mechanical Variables Measurements - 951 Materials Science
DOI: 10.7498/aps.70.20201591
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373. Sea Clutter Data Augmentation Method Based on Deep Generative Adversarial Network

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Title of translation:
Authors: Ding, Bin (1); Xia, Xue (2); Liang, Xuefeng (1, 3)
Author affiliation: (1) Xi'an University, Xi'an; 710065, China; (2) Xi'an Shiyou University, Xi'an; 710065, China; (3) Xidian University, Xi'an; 710071, China
Corresponding author: Ding, Bin(xadb2005@163.com)
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Publisher: Science Press
Abstract: Due to the scarcity of sea clutter data, the high cost and long period of obtaining sea clutter data greatly limit the research of sea clutter characteristics and the application of ocean remote sensing. The method of sea clutter data generation based on the Generative Adversarial Networks (GAN) is studied. By extending the traditional GAN framework, a one-dimensional sea clutter data generation and identification model is formed. Based on the radar measured sea clutter data set, the generation and identification model training in the adversarial network is carried out. The amplitude distribution characteristics and time and spatial correlation of the sea clutter data generated by the model are analyzed. Based on the measured data, it is verified that the method can generate more sea clutter data with more variety, and similar distribution to the real sea clutter data. © 2021, Science Press. All right reserved.
Number of references: 17
Main heading: Generative adversarial networks
Controlled terms: Radar clutter - Clutter (information theory) - Radar measurement - Remote sensing
Uncontrolled terms: Adversarial networks - Amplitude distributions - Data augmentation - Data generation - Identification model - Ocean remote sensing - Real sea clutters - Spatial correlations
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Funding text: Xi'an Science and Technology Plan (2019KJWL30)
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374. Sensitivity analysis of coiled tubing erosion wear based on FLUENT (*Open Access*)

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Authors: Cao, Yinping (1); Chen, Zetian (1); Pan, Ying (1); Wang, Jianxing (2); Mi, Hongxue (2); Dou, Yihua (1)
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Conference name: 2021 5th International Conference on Fluid Mechanics and Industrial Applications, FMIA 2021
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Conference location: Taiyuan City, China
Conference code: 171061
Sponsor: Asian Union of Information Technology
Publisher: IOP Publishing Ltd
Abstract: Erosion wear is the main reason for the failure of coiled tubing during hydraulic jet fracturing operations. Taking Φ 60.325mm 4.775mm CT90 coiled tubing as the research object. Three-dimensional finite element model of coiled tubing is established. The effects of mass flow, particle flow rate, particle diameter and other sensitive factors on the erosion characteristics of coiled tubing were analyzed by FLUENT software. The research results show that: The erosion wear rate of coiled tubing shows a nonlinear increasing trend with the increase of mass flow and particle flow rate, and the increasing trend is firstly slow and then sharply. As the particle diameter increases, the maximum erosion rate of coiled tubing changes irregularly. The particle flow rate is most sensitive to the erosion of coiled tubing. The

finite element method used in this article provides a reference for the evaluation of the erosion wear of coiled tubing in hydraulic fracturing operations. © Published under licence by IOP Publishing Ltd.
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Main heading: Erosion
Controlled terms: Finite element method - Particle size - Sensitivity analysis - Coiled tubing - Boreholes - Fracture - Mass transfer - Wear of materials
Uncontrolled terms: Erosion characteristics - Erosion rates - FLUENT software - Fracturing operations - Particle diameters - Research object - Research results - Three dimensional finite element model
Classification code: 619.1 Pipe, Piping and Pipelines - 641.3 Mass Transfer - 921 Mathematics - 921.6 Numerical Methods - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
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375. Influence of silicon infiltration on the wear and oxidation resistance of hot-pressed B4C/C(graphite) composites

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Authors: Jiang, Tao (1); Han, Manman (1); Fu, Jia (1)
Author affiliation: (1) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
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Abstract: B4C/C(graphite) composites were produced using Hot-pressing. However, the composites exhibited low surface hardness, low wear resistance as well as low oxidation resistance. The hot-pressed B4C/C(graphite) composites were processed via silicon infiltration procedure at 1550 °C for 2 h in the vacuum condition to refine the wear resistance, surface hardness, and oxidation resistance of the B4C/C(graphite) composites. The silicon infiltration process resulted in the fabrication of a surface layer based on silicon carbide and silicon upon the B4C/C(graphite) composites surface. The surface layer of the silicon infiltrated B4C/C(graphite) composites, primarily comprising silicon carbide and silicon, was examined for its phase composition and microstructure. The oxidation resistance, wear resistance, and surface hardness of B4C/C(graphite) composites subjected to silicon infiltration was additionally examined. The XRD results confirmed that silicon carbide and silicon-based layer existed on the surface of B4C/C(graphite) composites, which was produced as a result of the silicon infiltration process. The surface of silicon infiltrated B4C/C(graphite) composites exhibited a 300–400 μm thick covering of silicon carbide and silicon. The deposited layer also exhibited a dense and compact microstructure. When compared to hot-pressed B4C/C(graphite) composites, the surface hardness and wear resistance of the composites resulting after silicon infiltration were significantly enhanced. Silicon infiltrated B4C/C(graphite) composites possess a surface hardness of 16–17 GPa. The oxidation resistance of the silicon infiltrated B4C/C(graphite) composites was considerably enhanced as compared to the hot-pressed B4C/C(graphite) composites. So the silicon infiltrated B4C/C(graphite) composites exhibited high surface hardness, excellent wear resistance and excellent oxidation resistance in comparison with the hot-pressed B4C/C(graphite) composites. © 2021 Elsevier Ltd and Techna Group S.r.l.
Number of references: 43
Main heading: Wear resistance
Controlled terms: Wear of materials - Oxidation resistance - Silicon carbide - Graphite - Boron carbide - Hot pressing - Microstructure - Hardness

Uncontrolled terms: A hot pressing - B composite - C hardness - Graphite composites - Infiltration process - Surface hardness - Surface layers - Surface oxidations - Vacuum condition - Wear and oxidation resistance
Classification code: 539.1 Metals Corrosion - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 812.1 Ceramics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Pressure 1.70E+10Pa, Size 4.00E-04m, Temperature 1.823E+03K, Time 7.20E+03s
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376. Group Decoding with Static Clustering for Cloud Radio Access Networks

Accession number: 20220711627999
Authors: Wang, Niwei (1); Wang, Tengwei (2); Han, Xuekun (1); Xu, Xiaofan (1); Li, Guo (1)
Author affiliation: (1) China Satellite Network Innovation Co., Ltd., Beijing, China; (2) Xi'An Shiyou University, Xian, China
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Abbreviated source title: Int. Conf. Commun. Technol. Proc. ICCT
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Document type: Conference article (CA)
Conference name: 21st IEEE International Conference on Communication Technology, ICCT 2021
Conference date: October 13, 2021 - October 16, 2021
Conference location: Tianjin, China
Conference code: 176156
Sponsor: Beijing University of Posts and Telecommunications; Chongqing University; ComSoc; Guangxi University; Science and Technology on Communication Information Security Control Laboratory (CISC); Xidian University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: We consider a static clustering algorithm and the associated group decoding technology in the uplink cloud radio access networks (C-RAN), where the remote radio heads (RRHs) are connected to a common cloud processing (CP). In our work, the long-term average received signal strength is employed to design the static clustering, which is only updated as the user equipment (UE) location changes. Due to the C-RAN characteristics, each cluster is served by a data server which processes the decoding group in parallel and aims to achieve the maximal sum-rate per cluster. Simulation results illustrate that the proposed static clustering parallel group decoder (SC-PGD) always outperforms the random clustering algorithm and the static clustering without group decoding. In addition, increasing the group size leads to an increase in the sum-rate. © 2021 IEEE.
Number of references: 16
Main heading: Radio access networks
Controlled terms: Decoding - Radio - Clustering algorithms
Uncontrolled terms: Cloud processing - Cloud radio access network - Clusterings - Decoding technology - Group decoding - Radio access networks - Remote radio head - Remote radio heads - Static clustering - Sum-rate
Classification code: 716.3 Radio Systems and Equipment - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis
DOI: 10.1109/ICCT52962.2021.9657895
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Database: Compendex
Data Provider: Engineering Village
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377. Simulation of liquid gas and displacement optical fiber sensing system based on vortex beam

Accession number: 20213610854864
Authors: Fu, Haiwei (1, 2); Wang, Shuai (1, 2)

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Corresponding author: Fu, Haiwei(hwfu@xsyu.edu.cn)
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Language: English
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Publisher: Elsevier GmbH
Abstract: This paper attempts to propose an optical fiber sensing system based on the vortex beam, which can be applied to measure liquid refractive index (RI), gas concentration and displacement. Its sensing structure consists of a silver-coated microfiber for surface plasma resonance (SPR) sensors, a fiber aligned with it, and a interference structure for Gaussian beam interfering with the transmitted vortex beam. Due to SPR effect, when the RI of liquid changes, the wavelength of resonance spectrum will shift accordingly, thus the sensitivity of the RI can be achieved. When the gas refractive index n and distance L between two fiber end face change, phase difference will be generated between the transmitted vortex beam and the bypass Gaussian beam. Thereupon, the interference pattern of the two beams will rotate, the measurement of the gas RI and displacement can be achieved. In comparison with the traditional optical fiber SPR sensor, the simulation result shows that SPR excited by the vortex beam is more explicit with higher sensitivity. When the RI of the external environment is 1.385, the sensitivity of 4600 nm/RIU under the condition of Gaussian beam, the sensitivity of sensor based on vortex beam increases to 6800 nm/RIU, which is 47.8% higher. When the RI of the external environment is 1.365–1.385, the average sensitivity of the sensor increases from 3950 nm/RIU to 5100 nm/RIU. Meanwhile, the gas RI sensitivity is 36°/0.0001 RIU and the displacement sensitivity is 36°/ 100 nm. In terms of the CCD angle resolution, the theoretical resolution of gas RI measurement is 1.54e-10 RIU, and the resolution of displacement is 1.54e-4 nm. © 2021 Elsevier GmbH
Number of references: 20
Main heading: Refractive index
Controlled terms: Gases - Resonance - Blood - Liquefied gases - Vortex flow - Gaussian beams - Optical fibers
Uncontrolled terms: Displacement - External environments - Gas refractive index - Gaussians - Liquid refractive index - Optical fiber sensing - Sensing systems - Surface plasma resonance sensors - Surface plasma resonances - Vortex beams
Classification code: 461.2 Biological Materials and Tissue Engineering - 631.1 Fluid Flow, General - 711 Electromagnetic Waves - 741.1 Light/Optics - 741.1.2 Fiber Optics - 931.1 Mechanics
Numerical data indexing: Percentage 4.78E+01%, Size 1.00E-07m, Size 1.54E-09m to 4.00E-09m, Size 3.95E-06m, Size 4.60E-06m, Size 5.10E-06m, Size 6.80E-06m
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Funding text: This work is supported by the National Natural Science Foundation of China (No. 41474108), the Research Foundation of Education Bureau of Shaanxi Province, China (Nos. 12JS077 and 14JS073), and the Innovative and Practical Ability Training Program for Postgraduates of Xi'an Shiyou University (No. YCS18112030).
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Data Provider: Engineering Village
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378. An adaptive method for recognition of dual-pointer mechanical instrument based on hough transform (*Open Access*)

Accession number: 20210809937675
Authors: Ma, Tong (1, 2); Li, Tiantai (1, 2); Zhang, Ming (1, 2); Zhang, Chuan (3); Shi, Kexin (1, 2)
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Volume: 632
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Language: English
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Document type: Conference article (CA)
Conference name: 2020 Asia Conference on Geological Research and Environmental Technology, GRET 2020
Conference date: October 10, 2020 - October 11, 2020
Conference location: Kamakura City, Japan
Conference code: 167012
Publisher: IOP Publishing Ltd
Abstract: For automatic and efficient reading of dual-pointer mechanical instruments in petroleum engineering applications, an adaptive recognition method based on Hough transform is proposed. Firstly, the instrument dial is detected by Hough transform. Then the center of circle is located, as well as the pointer is recognized. Finally, the linear relationship between the dial scale and the pointer is adopted to calculate the pointer reading. The experimental results show that the algorithm achieves high application value for the dual-pointer mechanical instrument with uniform scales. © Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence.
Number of references: 9
Main heading: Hough transforms
Controlled terms: Petroleum engineering - Instrument dials
Uncontrolled terms: Adaptive methods - Adaptive recognition - Engineering applications - High application value - Linear relationships - Mechanical instruments - Uniform scale
Classification code: 921.3 Mathematical Transformations
DOI: 10.1088/1755-1315/632/3/032038
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2019QNKYCXTD04, Acronym: -, Sponsor: -; Number: 2017ZX05069004, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This work was financially supported by the National Science and Technology Major Project (Grants No. 2017ZX05069004), the Youth Science and Technology Innovation Fund Project of Xi'an Shiyou University and the Youth Innovation Team of Xi'an Shiyou University (No. 2019QNKYCXTD04). The authors would like to thank the editors and the reviewers for their careful review of this manuscript.
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379. Research on measurement technology of moisture content by radio frequency method based on helical antenna

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Authors: Ruirong, Dang (1); Li, Zong (1); Pei, Yang (1); Feng, Cao (1)
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Corresponding author: Pei, Yang(122717224@qq.com)
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Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The antenna is an important part of the radio frequency method to measure the water content. With the continuous development of gas field, the water production of gas wells has shown significant growth trend during the mine of conventional natural gas. Hence there is an urgent need for wet gas water content measurement technology due to the fact that the production measurement of the single well is closely related to the economic interests of the mining party. In this paper, the detection principle of the radio frequency method based on the helical antenna is described to content measurement moisture. Based on the COMSOL simulation platform, the structures suitable for moisture content measurement are constructed, where the moisture content that is at 0-5% has been simulated and tested. Such design should pave for the realization of online non-separated moisture content measurement. © 2021 IEEE.
Number of references: 10
Main heading: Simulation platform
Controlled terms: Moisture determination - Gas industry - Helical antennas - Natural gas wells - Moisture - Radio waves
Uncontrolled terms: Content measurements - Continuous development - Economic interests - Measurement technologies - Moisture content measurement - Production measurement - Radio frequencies - Water production
Classification code: 512.2.1 Natural Gas Fields - 522 Gas Fuels - 711 Electromagnetic Waves - 723.5 Computer Applications - 944.2 Moisture Measurements
Numerical data indexing: Percentage 0.00e+00% to 5.00e+00%
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380. Numerical study of drill string uncertainty in acoustic information transmission (*Open Access*)

Accession number: 20211810272561
Authors: Xie, Haiming (1); Zhang, Peifen (2); Zhou, Jing (1)
Author affiliation: (1) National Engineering Laboratory for Oil and Gas Drilling Technology, Xian Shiyou University, Xi'an, Shaanxi, China; (2) Xi'An Quan Feng Zhi Kong Technology Co., Ltd, Xi'an, Shaanxi, China
Corresponding author: Xie, Haiming(haimingxie@xsyu.edu.cn)
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Conference name: 2021 3rd International Forum on Geoscience and Oceanography, IFGO 2021

Conference date: March 12, 2021 - March 14, 2021
Conference location: Suzhou, Virtual, China
Conference code: 168515
Publisher: IOP Publishing Ltd
Abstract: Acoustic data transmission in drill string is one of the effective methods to solve the bottleneck of downhole information transmission speed, but its channel characteristics are mainly affected by the structural changes of string. In the process of drilling, the downhole BHA changes constantly according to the well condition, and the shape of drill string changes indefinitely under the condition of wear and force, which leads to the uncertainty of acoustic channel. Through the numerical simulation analysis, we can get the channel changes of drill string in different shapes, and analyze the main factors that affect the information transmission. The size inconsistency of multiple drill strings will lead to the deterioration of the channel characteristics to a certain extent, but the aperiodic drilling tool structure in the channel will cause a significant change in the transmission characteristics. © Published under licence by IOP Publishing Ltd.
Number of references: 20
Main heading: Drill strings
Controlled terms: Deterioration - Infill drilling - Drills
Uncontrolled terms: Acoustic channels - Acoustic data transmissions - Acoustic information - Channel characteristics - Different shapes - Information transmission - Numerical simulation analysis - Transmission characteristics
Classification code: 511.1 Oil Field Production Operations - 511.2 Oil Field Equipment - 603.2 Machine Tool Accessories - 951 Materials Science
DOI: 10.1088/1755-1315/734/1/012024
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381. FE simulation of sealing ability for premium connection based on ISO 13679 CAL IV tests

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Authors: Dou, Yihua (1); Li, Yufei (2); Cao, Yinping (1); Yu, Yang (1); Zhang, Jiantao (2); Zhang, Lin (2)
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Pages: 138-148
Language: English
ISSN: 17579864
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Document type: Journal article (JA)
Publisher: Emerald Group Holdings Ltd.
Abstract: Purpose: To maintain the well integrity, the strength and sealing ability of premium connection should be in the safe scope. ISO 13679 is widely used for evaluating the ability of tubing and casing connection all over the world. FE is adopted to simulate the ISO 13679 tests. Design/methodology/approach: Because of the disadvantage of experiment such as long period, high cost and high requirement on the facility, considering the convenience and universality of finite element method, as well as the contacting nonlinearity and material nonlinearity, three-dimensional finite element model of a certain type of premium connection is established with the consideration of helix angle. The loads exerted on the premium connection are the loads in series B test and thermal cycle test of ISO 13679. The

distributions of Von Mises stress and contact pressure in various cases were studied. Findings: The results showed that the bending load has a great influence on the distribution of Von Mises stress and contact pressure for premium connection. The Von Mises stress and contact pressures on the sealing surface are smaller on the tension side and greater on the compression side. With increasing axial compression load, the contact pressures on the tension side are too small, which may lead to sealing failure. The influence of temperature on the performance of premium connection cannot be ignored when choosing or designing premium connections. Both the Von Mises stress and contact pressure decrease slightly during a period of thermal cycle. Although the performance of the premium connection is good in a period of thermal cycle, its performance in a long period should be evaluated. Finite element simulation can effectively simulate the ISO 13679 test procedure and obtain the stress and contact pressure distribution. It can be used as a reference for evaluating the performance of premium connections. Originality/value: Considering the convenience and universality of finite element method, as well as the contacting nonlinearity and material nonlinearity, three-dimensional finite element model of a certain type of premium connection is established with the consideration of helix angle. © 2020, Emerald Publishing Limited.
Number of references: 17
Main heading: Finite element method
Controlled terms: Thermal cycling - Pressure distribution
Uncontrolled terms: Axial compression load - Casing connection - Contact pressure distribution - Design/methodology/approach - Finite element simulations - Material non-linearity - Thermal cycle tests - Three dimensional finite element model
Classification code: 921.6 Numerical Methods - 931.1 Mechanics
DOI: 10.1108/IJSI-11-2019-0125
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382. Accumulation mechanism of tight sandstone oil in Gaotaizi reservoir in Qijia area, Songliao Basin

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Title of translation:
Authors: Wu, Weitao (1, 2); Zhao, Jingzhou (1, 2); Meng, Qi'an (3); Lin, Tiefeng (3); Zhang, Ge (3); Zhang, Jinyou (3); Si, Shanghua (1, 2); Bai, Yubin (1, 2)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Key Laboratory of Hydrocarbon Accumulation of Shaanxi Province, Xi'an Shiyou University, Xi'an; 710065, China; (3) Exploration and Development Research Institute of Daqing Olifield Company Ltd, Daqing; 163712, China
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Document type: Journal article (JA)
Publisher: Editorial Department of Oil and Gas Geology
Abstract: Tight oil has become an important exploration field in China's petroliferous basins. The study focuses on the tight oil of Gaotaizi reservoir of Qijia area in the Songliao Basin. An array of data obtained from core, thin section, and fluid inclusion observation, geochemical analysis and production test, are applied to analyze the characteristics of the Gaotaizi tight sandstone reservoir, and clarify the accumulation mechanism of tight oil. The results show that the pore space of Gaotaizi reservoir is dominated by residual intergranular pores and feldspathic dissolved pores, with a mean porosity of 9.17% and a mean permeability of 0.45×10-3 μm2. On map view, the porosity of Gaotaizi sandstone reservoir in the northern part of Qijia area is mostly over 12%, while that in the sorth-central area is mostly less than 12%, thus belonging to tight reservoir. The tight reservoirs are mainly of faulted, lithologic-faulted and lithologic types

in quasi-continuous distribution and are laterally superimposed and connected and vertically overlapped. They are controlled by sand body distribution, faults and reservoir physical properties, instead of structural highs. The source rocks of the 1st and 2nd members of Qingshankou Formation (Qing 1 and Qing 2 members) are of high quality at the peak of oil generation, featuring relatively large thickness and a TOC content of 2.47% and 1.6%, respectively. The tight oil accumulation occurred in 3 episodes of 2 stages, that is the late Nenjiang period and Mingshui period. The faults which do not cut through the Qingshankou Formation, fractures and sand bodies provide pathways for tight oil migration. The burial depth of the top surface of the Gaotaizi reservoir was 800-1 400 m at the end of the Nenjiang Formation deposition, corresponding to a palaeo-porosity of about 21%-15%, and the maximum residual pressure was about 10 MPa, resulting in only conventional reservoir in the center. While its burial depth was 1 600-2 200 m at the end of Mingshui Formation deposition, corresponding to a palaeo-porosity of about 13%-7%, and the maximum residual pressure was over 25 MPa, resulting in tight oil reservoir in wide distribution. The accumulation model of tight oil therein can be concluded as a quasi-continuous type of dual sourced hydrocarbon charging, featuring an lower source rock-upper reservoir assemblage and source-reservoir alternating configuration. © 2021, OIL & GAS GEOLOGY Editorial Board. All right reserved.
Number of references: 39
Main heading: Porosity
Controlled terms: Analytical geochemistry - Deposition - Petroleum prospecting - Sandstone - Quality control - Petroleum reservoir engineering - Textures
Uncontrolled terms: Accumulation mechanisms - Accumulation periods - Gaotaizi reservoir - Qijia area - Sand body - Sandstones reservoirs - Songliao basin - Source rocks - Tight oil in sandstone reservoir - Tight reservoir
Classification code: 481.2 Geochemistry - 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 801 Chemistry - 802.3 Chemical Operations - 913.3 Quality Assurance and Control - 931.2 Physical Properties of Gases, Liquids and Solids
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Compendex references: YES
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383. Oil-gas Cost in the Declining Period Predicting Model Based on Self-adaptive GM(1, $1,\lambda)$

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Authors: Yue, Zhao (1); Diyi, Shi (2)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China; (2) Cnpc Chuanqing Drilling Engineering Company Limited, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Language: English
ISBN-13: 9780738143705
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Firstly, the construction process of the traditional GM(1,1) model is analyzed. Secondly, theoretical defects existing in traditional GM(1,1) model are studied. Based on this, taking advantaged of an self-adaptive GM (1,1, $lambda$) model which is deduced by the structure method of background value that contained a self-adaptive factor $lambdain(0,1)$ is introduced into the traditional GM (1,1) model's definition based on its feasibility is proved by the mean value theorem for integrals, the oil-gas operating cost in the production declining period forecasting model based on self-adaptive GM(1,1, $lambda$) is established. Finally, with the oil-gas operating cost data of an oilfield

in the production declining period, compared with the classic optimization background value GM(1,1) model and the traditional GM (1,1) model, the results show that the proposed model has a higher prediction precision. © 2021 IEEE.
Number of references: 8
Main heading: Operating costs
Controlled terms: Forecasting - System theory
Uncontrolled terms: Adaptive factors - Background value - Construction process - Declining period - Forecasting modeling - Mean value theorem - Predicting models - Prediction precision
Classification code: 911.1 Cost Accounting - 911.2 Industrial Economics - 961 Systems Science
DOI: 10.1109/ICSP51882.2021.9408831
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384. A miniaturized tri-band bandpass microstrip filter using multiple resonators with sharp skirts

Accession number: 20204109335474
Authors: Wang, Chenhao (1); Xi, Xiaoli (1); Zhao, Yuchen (1); Shi, Xiaomin (2)
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Corresponding author: Xi, Xiaoli(xixiaoli@xaut.edu.cn)
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Abbreviated source title: Int. J. Microw. Wirel. Technol.
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Issue: 5
Issue date: June 2021
Publication year: 2021
Pages: 430-434
Language: English
ISSN: 17590787
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Document type: Journal article (JA)
Publisher: Cambridge University Press
Abstract: In this paper, a miniaturized tri-band bandpass microstrip filter using stub loaded rectangular ring resonator (SLRRR) shorted stub loaded stepped impedance resonators (SSLSIR), and stepped impedance resonators (SIR) with sharp skirts is presented. Two SSLSIRs are embedded paralleled inside SLRRR to generate a quasi-elliptic response at second and third passband. The odd-even fundamental resonant mode and first high-order resonant mode of the SIRs are exploited to generate tri-band response. Three bandwidths can be controlled independently due to different signal paths. Extra transmission zeros are introduced by the configuration of 0° feed structure. Sharp skirts are achieved at the upper edge of each passband by #g/4 lines which are loaded at the I/O ports. An example of the proposed tri-band filter operating at 2.76 GHz/5.7 GHz/7.63 GHz for TDD-LTE/WLAN/VSAT applications is implemented and fabricated. The simulation and measurement show a good agreement. © 2020 The Author(s). Published by Cambridge University Press in association with the European Microwave Association.
Number of references: 15
Main heading: Microstrip filters
Controlled terms: Microwave filters - Bandpass filters - Optical resonators
Uncontrolled terms: Feed structure - Multiple resonators - Quasi-elliptic response - Resonant mode - Ring resonator - Simulations and measurements - Stepped impedance resonator - Transmission zeros
Classification code: 703.2 Electric Filters - 708.1 Dielectric Materials - 741.3 Optical Devices and Systems
DOI: 10.1017/S1759078720001312
Compendex references: YES
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385. Application of High Resistance Operational Amplifier CA3140A in Signal Conditioning Circuit of Gamma Logging Tool (*Open Access*)

Accession number: 20212110398118
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Corresponding author: Tian, Xiaochao(tianxiaochao@cctegxian.com)
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Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: The current type signal of gamma detector in gamma logging tool is generally weak, which can not be directly input into microcontroller for pulse counting and statistical analysis. The signal conditioning circuit is designed by using high performance, low noise, small volume single operational amplifier CA3140A, which processes the weak signal from gamma detector, and realizes the corresponding hardware circuit according to the actual application requirements. The experimental results show that: the circuit design performance is stable, and can effectively pick up and process the effective pulse signal, which meets the expected design requirements. © Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Timing circuits
Controlled terms: Strain measurement - Integrated circuit manufacture - Electric network analysis - Signal conditioning circuits
Uncontrolled terms: Application requirements - Circuit designs - Gamma detectors - Gamma loggings - Hardware circuits - High resistance - Pulse counting - Pulse signal
Classification code: 703.1.1 Electric Network Analysis - 713.4 Pulse Circuits - 714.2 Semiconductor Devices and Integrated Circuits - 722.4 Digital Computers and Systems - 943.2 Mechanical Variables Measurements
DOI: 10.1088/1742-6596/1894/1/012067
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Compendex references: YES
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386. Effect of Injection Pressure on CO2Huff-n-Puff in Low-Permeability Sandstone Cores Using Nuclear Magnetic Resonance (*Open Access*)

Accession number: 20211410173494
Authors: Wang, Deyu (1); Ju, Yingjun (1); Feng, Songlin (1); Chen, Shidong (1); Wei, Wen (1); Ma, Jingyang (1); Zhang, Tong (1); Zhao, Jinsheng (2)

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Corresponding author: Zhao, Jinsheng(jszhao@xsyu.edu.cn)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
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Issue: 1
Issue title: 2020 International Conference on New Energy, Power and Environmental Engineering, NEPEE 2020
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Article number: 012032
Language: English
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Document type: Conference article (CA)
Conference name: 2020 International Conference on New Energy, Power and Environmental Engineering, NEPEE 2020
Conference date: December 20, 2020 - December 21, 2020
Conference location: Xiamen, Virtual, China
Conference code: 167946
Publisher: IOP Publishing Ltd
Abstract: In order to figure out the micro-scale recovery degree of different pore sizes, the T2 spectrum of low-permeability sandstone cores before and after CO2 huff-n-puff is obtained using NMR technique. The results show that the micro-scale recovery degree increases with increase of pore sizes. Oil in macropores and medium pores is more easily produced, and Oil in micropores is difficult to recover at 7-12MPa. The total recovery degree of three cores increases with the increase of injection pressure. This study is expected to be significant for understanding the mechanisms of CO2 huff-n-puff for enhancing oil recovery in low-permeability sandstone reservoirs. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Pore size
Controlled terms: Low permeability reservoirs - Recovery - Sandstone - Carbon dioxide - Petroleum reservoir engineering - Nuclear magnetic resonance
Uncontrolled terms: Different pore sizes - Injection pressures - Low permeability sandstone - Low-permeability sandstone reservoirs - NMR techniques - Oil recoveries - T2 spectrums - Total recovery
Classification code: 482.2 Minerals - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Pressure 7.00e+06Pa to 1.20e+07Pa
DOI: 10.1088/1755-1315/696/1/012032
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Compendex references: YES
Open Access type(s): All Open Access, Gold
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387. Experimental Study on Seismic Response of Buried Oil and Gas Pipeline Soil Layers under Lateral Multipoint Excitation (*Open Access*)

Accession number: 20213010679670
Authors: Dai, Jianbo (1); Wang, Li (2); Hu, Chengtao (1); Zhang, Guidi (1)
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Issue date: 2021
Publication year: 2021
Article number: 9887140
Language: English
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CODEN: SHVIE8
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: The seismic response of buried oil and gas pipelines is mainly influenced by the site soil. In this paper, a bidirectional laminar shear continuum model box is developed for the site response of buried oil and gas pipelines under transverse multipoint seismic excitation. By comparing the acceleration response of the soil and pipeline, monitoring the soil displacement, and analyzing the acceleration coefficient and Fourier spectrum, the seismic response characteristics of the soil at different excitation modes and peak seismic acceleration and its laws were investigated. The test results show that the soil under transverse excitation undergoes the process of soil compaction to nonlinear characteristics and finally soil damage, and the course of multipoint excitation develops faster and causes more serious soil damage. The peak Fourier spectrum of both the pipe and the soil appears at the frequency of 4-6 Hz, and in general, the acceleration of the pipe is greater than that of the soil; the difference between the two gradually decreases with the increase of loading level. Compared with the uniform excitation, the increase in the loading level during the lateral multipoint excitation will result in a decrease of the consistency of the acceleration time history curve at each measurement point and a decrease of the peak of the spectrum. The effect of laminar shear between soil bodies becomes more obvious with the increase of acceleration peaks on the shaking table. It is also found out that the excitation method has little effect on the displacement time history curve, but the multipoint excitation may cause fluctuations in the displacement time history curve. © 2021 Jianbo Dai et al.
Number of references: 19
Main heading: Soils
Controlled terms: Continuum mechanics - Fourier series - Shear flow - Soil mechanics - Seismic response - Pipelines - Acceleration
Uncontrolled terms: Acceleration coefficients - Acceleration-time history - Displacement-time history - Multi-point excitation - Nonlinear characteristics - Oil-and-Gas pipelines - Seismic response characteristics - Transverse excitation
Classification code: 483.1 Soils and Soil Mechanics - 484.2 Secondary Earthquake Effects - 619.1 Pipe, Piping and Pipelines - 631.1 Fluid Flow, General - 921.3 Mathematical Transformations - 931.1 Mechanics
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DOI: 10.1155/2021/9887140
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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388. Research of Incremental Learning Algorithm for SVM Based on Class Center Diameter (*Open Access*)

Accession number: 20212110398125
Authors: Li, Jinfeng (1); Xie, Wenhao (2)
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Corresponding author: Xie, Wenhao(xwhaoxwhao@163.com)
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Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: Institute of Physics
Abstract: In the learning process based on ISVM, how to effectively retain the history information and selectively discard some new training data, so as to maintain the classification accuracy and save the storage space after adding new samples every time, which is the key of the current ISVM classification algorithm. This thesis proposes a new incremental learning algorithm, that is, SVM incremental learning algorithm based on cluster diameter (CD-ISVM). This algorithm firstly calculates the two centers of the positive and negative samples, and then to build the boundary vector set by the coordinates of the two class centers. Moreover, KKT conditions are combined to filter incremental data and boundary vector set, and feedback information is provided to adjust the position of the boundary vector set. Then, the union of SV set and boundary vector set is taken as the increment set. After several increments, a classifier with strong generalization is finally trained. © Published under licence by IOP Publishing Ltd.
Number of references: 15
Main heading: Learning algorithms
Controlled terms: Classification (of information) - Clustering algorithms - Digital storage - Support vector machines - Vectors
Uncontrolled terms: 'current - Class Centers - Classification accuracy - Classification algorithm - History informations - Incremental learning - Learning process - Process-based - Storage spaces - Training data
Classification code: 716.1 Information Theory and Signal Processing - 722.1 Data Storage, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 723.4.2 Machine Learning - 903.1 Information Sources and Analysis - 921.1 Algebra
DOI: 10.1088/1742-6596/1894/1/012074
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Data Provider: Engineering Village
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389. Physical simulation of hydraulic fracturing of large-sized tight sandstone outcrops

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Authors: Guo, Tiankui (1); Tang, Songjun (1); Liu, Shun (2); Liu, Xiaoqiang (2); Xu, Jianchun (2); Qi, Ning (3); Rui, Zhenhua (3, 4)
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Language: English
ISSN: 1086055X
CODEN: SPJRFW
Document type: Journal article (JA)
Publisher: Society of Petroleum Engineers (SPE)
Abstract: Hydraulic fracturing is an indispensable technology in developing tight oil and gas resources. However, the development of tight oil and gas is not consistently satisfactory. Further understanding of hydraulic fracturing of tight sandstone is required, which increases the production of tight oil and gas reservoirs, particularly in China. Currently, there are a few true triaxial hydraulic fracturing physical simulations of large tight sandstone outcrops. To weaken the boundary effect, this study performed simulations using large tight sandstone outcrops (500 × 500 × 500 mm and 500 × 500 × 800 mm) in the Shahezi Formation (Fm.), Jilin Province, China. The effect of natural fracture (NF) development degree, in-situ stress conditions, fracturing treatment parameters, and temporary plugging on fracture propagation were investigated. Furthermore, fracture propagation was investigated based on post-fracturing fine

reconstruction, high-energy computed tomography (CT) scan, acoustic emission monitoring (AEM), and analysis of a fracturing pressure curve. Finally, suggestions on fracturing treatment were proposed. The results show that the NF is a key factor in determining the hydraulic fracture (HF) morphology in the tight sandstone reservoir. Further, the number, approaching angle, and cementation strength of the preexisting NF affect the HF propagation path; these are the key factors for forming complex fractures. In the tight sandstone reservoir with well-developed NFs, the fracture morphology is dominated by the NF under horizontal differential stress $\leq$ 9 MPa. A single fracture is more likely to occur under horizontal differential stress $\geq$ 12 MPa, which is less affected by the NF. In the fracturing at variable injection rates, a low rate facilitates fluid penetration into the NF, while a high rate facilitates deep HF propagation. A low-viscosity fracturing fluid at a high rate facilitates further propagation of the temporary plugging agent (TPA), thus achieving deep temporary plugging and fracture diversion. A high-viscosity fluid does not facilitate accumulation and plugging of particulate TPA. Higher horizontal differential stress leads to a smaller diversion radius of new HF, which is closer to the original HF, leading to poorer stimulation effect. The results provide a reference for the fracturing design of the tight sandstone. Copyright © 2021 Society of Petroleum Engineers
Number of references: 49
Main heading: Hydraulic fracturing
Controlled terms: Horizontal wells - Petroleum reservoir engineering - Low permeability reservoirs - Sandstone - Computerized tomography - Tight gas - Viscosity - Acoustic emission testing - Energy resources - Fracturing fluids - Morphology
Uncontrolled terms: Acoustic emission monitoring - Computed tomography scan - Fracture morphology - Fracture propagation - Fracturing treatments - High viscosity fluids - Tight oil and gas reservoirs - Tight sandstone reservoirs
Classification code: 482.2 Minerals - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 525.1 Energy Resources and Renewable Energy Issues - 631.1 Fluid Flow, General - 723.5 Computer Applications - 751.2 Acoustic Properties of Materials - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Pressure 1.20e+07Pa, Pressure 9.00e+06Pa, Size 5.00e-01m, Size 8.00e-01m
DOI: 10.2118/204210-PA
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Funding text: We would like to acknowledge the financial support of the National Natural Science Foundation of China (Grant No.51874338) and express our gratitude to the project ZR2019QEE005 supported by the Shandong Provincial Natural Science Foundation.
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Database: Compendex
Data Provider: Engineering Village
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390. Research on damage assessment of buried standard and carbon-fibre-reinforced polymer petroleum pipeline subjected to shallow buried blast loading in Soil (*Open Access*)

Accession number: 20213610856070
Authors: Cui, Ying (1, 2); Fang, Jun (1); Qu, Zhan (1, 2); Song, Meimei (1); Zhao, Junhai (3)
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Abbreviated source title: Shock Vib
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Pages: 1DUUMY
Article number: 1459260
Language: English
ISSN: 10709622
CODEN: SHVIE8
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Buried petroleum pipelines may encounter threats from blast loading due to terrorist attacks, accidental explosions, and artificial blasting during in-progress construction. Carbon-fibre-reinforced polymer (CFRP) is often

used for the repair and reinforcement of buried petroleum pipelines. It is meaningful and necessary to distinguish the different responses and establish an effective damage assessment method for standard petroleum pipelines and CFRP-supported petroleum pipelines buried in soil under blast loading. In this study, under fixed end constraints, experimental analysis and numerical simulations were combined to assess the damage of a standard petroleum pipeline and a CFRP petroleum pipeline buried in soil under blast loading. The results showed that, for a scaled distance of 0.19 m/kg1/3, plastic deformation occurred on the surfaces of the two pipelines facing the explosive. The antiexplosion performance of the CFRP pipeline was better than that of the standard pipeline, and the CFRP sheets had a positive effect on the protection of the buried petroleum pipeline during the buried blast loading. Furthermore, based on pressure-impulse damage theory and with consideration of the feasibility under real circumstances, two pressure-impulse damage evaluation curves for standard and CFRP pipelines facing explosive loads were established separately based on a new critical ratio of the dent depth and length. Finally, based on the two pressure-impulse damage evaluation curves and the new critical ratio, two pressure-impulse damage criteria for these two buried petroleum pipelines were defined. Moreover, with the two pressure-impulse damage evaluation curves, mathematical formulae for the two different buried petroleum pipelines were established to generate pressure-impulse diagrams. With the established formulae, the damage to the standard buried pipeline and the CFRP pipeline could be evaluated effectively. Damage to other similar standard pipelines or CFRP pipelines buried in soil with different design parameters due to shallow buried blast loading could also be evaluated using this method. © 2021 Ying Cui et al.
Number of references: 43
Main heading: Terrorism
Controlled terms: Facings - Gasoline - Carbon fiber reinforced plastics - Soils - Damage detection - Explosives - Carbon fibers
Uncontrolled terms: Accidental explosion - Anti-explosion performance - Carbon fibre reinforced polymer - Damage assessments - Experimental analysis - Mathematical formulas - Pressure-impulse diagrams - Terrorist attacks
Classification code: 402 Buildings and Towers - 408.2 Structural Members and Shapes - 483.1 Soils and Soil Mechanics - 523 Liquid Fuels - 804 Chemical Products Generally - 817.1 Polymer Products - 971 Social Sciences
DOI: 10.1155/2021/1459260
Funding Details: Number: SYSJJ2019-17, Acronym: -, Sponsor: -; Number: 51878056,51974255, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China; Number: 2020JM-536,2021JQ-605, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was financially supported by the Natural Science Foundation of China (51974255 and 51878056), Natural Science Basic Research Program of Shaanxi Province (2020JM-536 and 2021JQ-605), and State Key Laboratory of Silicate Materials for Architecture Wuhan University of Technology (SYSJJ2019-17).
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391. Emotion Recognition in Singing using Convolutional Neural Networks

Accession number: 20211910343181
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Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Article number: 9408959
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ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: With the development of deep learning, convolution neural network (CNN) has been widely applied in the field of emotion recognition. The vital to enhance the performance of singing emotion recognition system is to select a suitable feature and establish reliable models. The feature of Mel Frequency Cepstral Coefficient (MFCC) method has been proved to be effective in recognizing emotions. Therefore, in this paper, CNN is used to build a model of singing emotion recognition system, and MFCC method is used in feature extraction. For improving the accuracy of this system, the feature matrices have been segmented into small slices, and the method of majority vote has been used in the test part to identify the emotion. To verify the generalization of this system, this paper provides two approaches in model building part. One approach distinguishes male and female speakers separately. The other one is to build a mixed model. The accuracy of the singing emotion recognition system has been improved in both approaches and is not influenced by using separate model or mixed model. © 2021 IEEE.
Number of references: 15
Main heading: Emotion Recognition
Controlled terms: Feature extraction - Convolution - Speech recognition - Convolutional neural networks - Deep learning
Uncontrolled terms: Convolution neural network - Emotion recognition - Feature matrices - Majority vote - Mel-frequency cepstral coefficients - Mixed modeling - Recognizing emotions - Reliable models
Classification code: 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 751.5 Speech
DOI: 10.1109/ICSP51882.2021.9408959
Funding Details: Number: 71704139, Acronym: -, Sponsor: -; Number: 2019JQ-661, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: Ac k n o w l e d g e m e n t s This work was supported by the Chinese National Science Foundation for Young Scholars [grant number 71704139]; and the National Science Foundation of Shaanxi Province [grant number 2019JQ-661].
Compendex references: YES
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Data Provider: Engineering Village
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392. Research on Data Mining of Physical Examination for Risk Factors of Chronic Diseases Based on Classification Decision Tree

Accession number: 20211910343093
Authors: Quancheng, Zhang (1); Jingbin, He (2)
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This paper analyzes the concept of classification analysis and the properties of decision tree, and gives the implementation process of ID3 algorithm. The medical examination data of medical examination information management system of Xi'an Shiyou University Hospital from 2013 to 2020 are selected as the training sample set and discretized, and a direct data model suitable for classification analysis is designed. ID3 algorithm is employed to classify and analyze the sampled data set, and the classification rules are extracted. Using the prediction conclusions of these classification rules, physical examination doctors can quickly and scientifically predict the possibility of chronic diseases of each university teacher. It can provide information technology support for the screening and prediction of chronic diseases and personalized intervention of chronic diseases. © 2021 IEEE.

Number of references: 6
Main heading: Decision trees
Controlled terms: Information management - Data mining - Diagnosis - Classification (of information) - Medical information systems - Forecasting - Diseases
Uncontrolled terms: Classification analysis - Classification decision - Classification rules - Implementation process - Information management systems - Information technology support - Medical examination data - University teachers
Classification code: 461.6 Medicine and Pharmacology - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 903 Information Science - 903.1 Information Sources and Analysis - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
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Compendex references: YES
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Data Provider: Engineering Village
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393. Design of remote group control system based on thermal environment of MODBUS launch vehicle

Accession number: 20213510848014
Authors: Li, Yijie (1); Li, Hong (1); Li, Pu (1); Cheng, Ying (1)
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Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at the problems of the ground simulation experiment of carrier rocket, such as the large number of regions divided, the different length of the device and the different model curve, the remote group control scheme of the rocket thermal environment was designed and realized. The system takes 108 sets of AC-DC conversion power electronic devices as the main power components, uses Ethernet Modbus TCP/IP communication protocol, and applies configuration software WinCC and S7-200 Smart PLC as the execution terminal. To be realized the monitoring of 108 AC - DC conversion power electronic equipment by a computer via multi-port switch. The system has been successfully applied in a research institute in Beijing, which improves the working efficiency and ensures the reliability and stability of the operation. © 2021 IEEE.
Number of references: 9
Main heading: Rectifying circuits
Controlled terms: Power electronics - Computer software - Electric switches - Rockets
Uncontrolled terms: AC-DC conversions - Configuration software - Group control system - Power electronic devices - Reliability and stability - Research institutes - Thermal environment - Working efficiency

Classification code: 654.1 Rockets and Missiles - 723 Computer Software, Data Handling and Applications
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394. Kinematics Analysis of Incomplete Gear and Rack Pumping Unit (*Open Access*)

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Authors: Shao, Jun (1); Ding, Kang (1); Wang, Dewei (2)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, China; (2) Jinzhou Oil Production Plant of PetroChina Liaohe Oilfield Company, China
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Publication year: 2021
Article number: 012090
Language: English
ISSN: 17426588
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Conference location: Guangzhou, Virtual, China
Conference code: 175185
Publisher: IOP Publishing Ltd
Abstract: A pumping unit with incomplete gear and rack reversal was designed for smooth motion and low energy consumption. This paper first describes the working principle of the pumping unit. The kinematical equation of the pumping unit is established on the basis of analyzing the kinematic relationship between the first tooth meshing area, the normal meshing area and the final tooth meshing area of incomplete gear and rack. The kinematic relationship curve of the pumping unit is obtained by ADAMS simulation. The simulation results show that the theoretical model is correct. By comparing the results with the conventional pumping unit, it can be seen that: The pumping unit has a smooth movement of the up-down strokes, with fluctuations of movement only in the process of changing directions. The incomplete gear and rack drive is smooth, which can improve the kinestate of the pumping unit. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 17
Main heading: Kinematics
Controlled terms: Pumping plants - Energy utilization - Pumps
Uncontrolled terms: Analyse of meshing relationship - Incomplete gear and rack - Kine-matical equations - Kinematic Analysis - Low energy consumption - Motion energy - Pumping unit - Smooth motions - Suspension point displacement - Tooth meshing
Classification code: 446 Waterworks - 525.3 Energy Utilization - 618.2 Pumps - 931.1 Mechanics
DOI: 10.1088/1742-6596/2095/1/012090
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395. Study on catalytic oxidation, flocculation and sedimentation of acidizing and fracturing wastewater (*Open Access*)

Accession number: 20213810928781
Authors: Yu, T. (1, 2, 3); Wang, F. (1, 2); Hu, H. (1, 2); Qu, C. (1, 2); Zhang, L. (1, 2)
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Document type: Journal article (JA)
Publisher: Technoscience Publications
Abstract: The acidizing and fracturing waste fluid in a wellsite in northern Shaanxi was treated by catalytic oxidation and flocculation precipitation. It investigated the effect of different coagulants and their dosage and the wastewater pH on coagulation precipitation. As for chemical oxidation experiment, it investigated the effect of oxidant dosage and reaction time on its treatment effect. The results showed that when 30% hydrogen peroxide (volume percentage) was added at the dosage of 0.3% and oxidized for 50 min, the pH was adjusted to 7.5 and 350 mg/L polyaluminum chloride (PAC) and 4 mg/L polyacrylamide were added (PAM); after processing the waste liquid, total iron, chemical oxygen demand (COD), chromaticity, and average corrosion rate were reduced from 252.75 mg/L, 3427.50 mg/L, 624.15°, and 0.1226 mm/a to 0.12 mg/L, 275.18 mg/L, 125° and 0.0217 mm/a, respectively; effective removal of iron and color, reduced COD, and controlled corrosion was achieved. © 2021 Technoscience Publications. All rights reserved.
Number of references: 36
Main heading: Corrosion rate
Controlled terms: Chlorine compounds - Coagulation - Ostwald ripening - Wastewater treatment - Iron - Chemical oxygen demand - Flocculation - Catalytic oxidation - Chemicals removal (water treatment)
Uncontrolled terms: Average corrosion rates - Chemical oxidation - Effective removals - Flocculation and sedimentation - Northern shaanxi - Polyaluminum chloride - Treatment effects - Volume percentage
Classification code: 451.2 Air Pollution Control - 452.3 Industrial Wastes - 452.4 Industrial Wastes Treatment and Disposal - 545.1 Iron - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
Numerical data indexing: Mass_Density 1.20e-04kg/m3, Mass_Density 2.53e-01kg/m3, Mass_Density 2.75e-01kg/m3, Mass_Density 3.43e+00kg/m3, Mass_Density 3.50e-01kg/m3, Mass_Density 4.00e-03kg/m3, Mass_Density 7.50e-03kg/m3, Percentage 3.00e+01%, Percentage 3.00e-01%, Time 3.00e+03s
DOI: 10.46488/NEPT.2021.V20I03.024
Funding Details: Number: 2017KJXX-49, Acronym: -, Sponsor: -; Number: 2019JM-506, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 18JS088, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work was supported by the Open Project Program of State Key Laboratory of Petroleum Pollution Control, and Shaanxi Youth Science and technology new star project (2017KJXX-49); and Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No.18JS088), and Natural Science Basic Research Plan in Shaanxi Province of China (Program 2019JM-506).
Compendex references: YES
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396. Study on the Seepage Force-Induced Stress and Poroelastic Stress by Flow through Porous Media around a Vertical Wellbore

Accession number: 20214311061121
Authors: Wang, Haiyang (1); Zhou, Desheng (1, 2); Gao, Qian (1); Fan, Xin (1); Xu, Jinze (1); Liu, Shun (1)

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Issue date: July 1, 2021
Publication year: 2021
Article number: 2150065
Language: English
ISSN: 17588251
E-ISSN: 1758826X
Document type: Journal article (JA)
Publisher: World Scientific
Abstract: Fluid flowing through reservoir pores not only generates poroelastic stress but also exerts seepage force on rock skeleton. However, the mechanism of seepage force is not clear. Traditional methods of analyzing wellbore stability and hydraulic fracture initiation are mainly focused on the poroelastic stress without the effects of seepage force. Based on the linear elasticity and consolidation theory, this paper analyzed the mechanism of seepage force and poroelastic stress, and presented an analytical solution for seepage force-induced stress around a vertical wellbore. It also introduced how to calculate poroelastic stress by exerting hypothetical body force and surface force. Through comparison and superposition of stress fields, this paper studied the change characteristics of the poroelastic and seepage force-induced stress under different borehole pressures and the effects of seepage force on the wellbore tensile failure. Numerical simulation results show that when fluid flows through the rock, using traditional models without considering, the effect of seepage force to calculate the borehole pressure-induced stress will result in lower calculation results. Compared with the traditional model, seepage force-induced circumferential tensile stress is larger, and the seepage force significantly reduces the formation breakdown pressure. Rocks near the borehole wall with lower permeability and larger Poisson's ratio have a greater action of seepage force. When fluid flows through the reservoir, the effects of seepage forces cannot be ignored in the analysis of hydraulic fracturing and wellbore stability.
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Number of references: 43
Main heading: Hydraulic fracturing
Controlled terms: Oil field equipment - Porous materials - Boreholes - Stresses - Flow of fluids - Seepage - Fracture - Rocks
Uncontrolled terms: Borehole pressure - Flowthrough - Fluid-flow - Formation breakdown pressure - Induced stress - Poroelastic stress - Seepage forces - Traditional models - Vertical wellbore - Wellbore stability
Classification code: 511.2 Oil Field Equipment - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 951 Materials Science
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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397. Sandy soil moisture content measurement method based on heated fiber Bragg grating

Accession number: 20214311054227
Authors: Zhao, Kuan (1); Gao, Hong (2); Chen, Fengyi (1); Wang, Ruohui (1); Qiao, Xueguang (1)
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Publication year: 2021
Article number: 102690
Language: English
ISSN: 10685200
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Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: Actively heated optical fiber method (AHFO) based on fiber Bragg grating (FBG) temperature measurement technology has been continuously applied in soil moisture monitoring due to its advantages such as good durability, quasi-distribution, and small size. The FBG alumina ceramic tube sensor with symmetrical internal heating is used to design a laboratory model. By changing the inner capillary tube, a continuous function was used to fit the calibration relationship between the temperature rise and the volumetric water content, and the influence of different heating times on the calibration relationship was analyzed. Laboratory test studies have shown that the capillary tube with a low thermal conductivity material inside can help improve the sensor's ability to resolve volumetric water content. The calibration relationship under short-time heating also has a high correlation, and it can also reduce the impact on the soil environment. The research results are of great significance for improving the measurement accuracy of the AHFO method and the improvement of the test method. © 2021 Elsevier Inc.
Number of references: 32
Main heading: Fiber Bragg gratings
Controlled terms: Moisture control - Alumina - Thermal conductivity - Calibration - Sand - Heating - Temperature measurement - Soil moisture - Aluminum oxide - Packaging materials
Uncontrolled terms: Active heating - Active heating fiber optical method - Fiber-optical - Heating time - Moisture content measurement - Optical methods - Sandy soils - Sandysoil - Soil moisture content - Volumetric water content
Classification code: 483.1 Soils and Soil Mechanics - 641.1 Thermodynamics - 694.2 Packaging Materials - 731.3 Specific Variables Control - 804.2 Inorganic Compounds - 944.2 Moisture Measurements - 944.6 Temperature Measurements
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398. Kinetic analysis applied to ferrous ions with hydrogen peroxide in acidified hydraulic fracturing reflux fluid model containing representative organic additives (*Open Access*)

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Authors: Qu, Xuan (1); Wang, Fan (1); Yang, Bo (1, 2); Li, JinLing (1, 2); Zhang, Le (1); Hu, Haijie (1); Qu, Chengtun (1, 2, 3)
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Article number: 103008
Language: English
ISSN: 18785352
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Acidified hydraulic fracturing technology is a technical measure that uses acid liquid to react with minerals in near wells or reservoirs to enhance permeability, oil well and shale gas extraction, and increase the injection volume of wells. After the acidification construction is completed, the residual acid liquid will be discharged to the ground, which forms acidified waste liquid with low pH and complex composition. Recent studies providing snapshots of processing technology on the acidified waste have highlighted the need to convert the high concentration of Fe(II) in the acidified wastewater into flocculating components through advanced oxidation process. Here we report the

discovery of the oxidation kinetics of ferrous ion in simulated acidified waste system, which based on the analysis of major pollutants and high iron content. We show that the change of concentration of ferrous ions was determined by chemiluminescence in tandem with flow injection, and the reaction of hydrogen peroxide with Fe(II) is a pseudo-first-order reaction. The reaction rate constants at Fe(II) of 50, 100 and 150 mg/L are 0.12612, 0.41686, 1.18230 s-1 respectively. In addition, we evaluated the adaptability of the catalytic oxidation system to acidified waste liquid. This offers a theoretical basis for treatment of acid hydraulic fracturing flowback and a series of treatability of tests, which serves to guide the selection of suitable treatment approach. © 2021 The Author(s)
Number of references: 35
Main heading: Water treatment
Controlled terms: Ions - Iron compounds - Kinetics - Fracture - Hydraulic fracturing - Water conservation - Catalytic oxidation - Hydrogen peroxide - Liquids - Low permeability reservoirs - Petroleum reservoir engineering - Rate constants - Additives
Uncontrolled terms: Advanced Oxidation Processes - Complex compositions - Concentration of fe - Organic additives - Oxidation kinetics - Processing technologies - Pseudo-first order reactions - Technical measures
Classification code: 444 Water Resources - 445.1 Water Treatment Techniques - 451.2 Air Pollution Control - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 931 Classical Physics; Quantum Theory; Relativity - 951 Materials Science
Numerical data indexing: Mass_Density 1.00e-01kg/m3, Mass_Density 1.50e-01kg/m3
DOI: 10.1016/j.arabjc.2021.103008
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399. Highly sensitive FBG pressure sensor based on square diaphragm

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Authors: Fan, Qinggeng (1, 2); Jia, Zhen'an (1, 2); Feng, Dequan (1, 2); Yong, Zhen (1, 2)
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Article number: 165559
Language: English
ISSN: 00304026
Document type: Journal article (JA)
Publisher: Elsevier GmbH
Abstract: A highly sensitive fiber Bragg grating (FBG) based square diaphragm pressure sensor has been designed and verified both in theory and experiment. The square diaphragm deflects due to the pressure difference generated at both sides of the square, and causes the compression along the axis of the pre-stretched FBG. The experimental results indicate that the pressure sensitivity of the proposed sensor reaches 3.402 pm/kPa in the range of 0–200 kPa with a higher coefficient of determination of 0.9985. Meanwhile, the sensor is found to present low hysteresis, good repeatability and resolution. Relative error recorded at 3.13 % represents that the effect of the temperature compensation is remarkable. Furthermore, the designed pressure sensor is simple, cost-effective and suitable for low pressure measurement. © 2020
Number of references: 28
Main heading: Pressure sensors

Controlled terms: Fiber Bragg gratings - Temperature distribution - Error compensation - Cost effectiveness
Uncontrolled terms: Coefficient of determination - Cost effective - Diaphragm pressure - Low hysteresis - Pressure differences - Pressure sensitivities - Relative errors - Temperature compensation
Classification code: 641.1 Thermodynamics - 911.2 Industrial Economics - 944.3 Pressure Measuring Instruments
Numerical data indexing: Percentage 3.13e+00%
DOI: 10.1016/j.ijleo.2020.165559
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400. Theoretical and experimental studies on concerted elimination of 1, 2-bromochloroethane monocation to C2H4+ and BrCl

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Authors: Wu, Hua (1); An, Mengdi (1); Wen, Junqing (1); Bai, Lihua (1); Li, Dongming (1); Liu, Jukun (2); Sun, Ruijuan (1); He, Wanlin (1); Lin, Lin (1); Li, Yumei (1)
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Corresponding authors: Wu, Hua(whua@xsyu.edu.cn); Wen, Junqing(jqwen1221@xsyu.edu.cn)
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Publication year: 2021
Article number: e26433
Language: English
ISSN: 00207608
E-ISSN: 1097461X
CODEN: IJQCB2
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: Ab initio calculations for the concerted elimination of 1, 2-bromochloroethane monocation (1,2-C2H4BrCl +) to C2H4+ and BrCl are performed using the Minnesota density functional M06-2X and the def2-TZVP basis set. Ab initio calculations are also carried out for the concerted elimination of 1,2-C2H4BrCl+ to C2H4 and BrCl+ because the positive charge can be assigned to either moiety in the dissociative ionization process of 1,2-C2H4BrCl+. Our results demonstrate that the concerted elimination channel of 1,2-C2H4BrCl+ to C2H4+ and BrCl is preferred and that 1,2-C2H4BrCl+ surpasses two energy barriers and then separates into C2H4+ + BrCl through an asynchronous concerted process. Experimentally, we confirm that this elimination channel is from the dissociative ionization process of 1,2-C2H4BrCl+ by using dc-slice imaging technique. The time-of-flight mass spectra of 1,2-bromochloroethane induced by femtosecond laser pulses show that C2H4+ occurs at a laser intensity of 6.0 × 1013 W/cm2, and BrCl+ occurs at a higher laser intensity than C2H4+. This finding is consistent with the theoretical result that the appearance energy of C2H4+ is lower than that of BrCl+. As such, the low-velocity component of BrCl+ is absent from our sliced images. © 2020 Wiley Periodicals LLC.
Number of references: 33
Main heading: Chlorine compounds
Controlled terms: Calculations - Ionization - Dissociation - Bromine compounds - Femtosecond lasers - Laser pulses - Mass spectrometry
Uncontrolled terms: Ab initio calculations - Appearance energy - Density functionals - Dissociative ionization - Laser intensities - Low velocities - Positive charges - Time-of-flight mass spectra
Classification code: 744.1 Lasers, General - 801 Chemistry - 802.2 Chemical Reactions - 921 Mathematics
DOI: 10.1002/qua.26433
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401. Design and Research of Network Security Threat Detection and Traceability System Based on AI

Accession number: 20220411514891
Authors: Wang, Hui (1); Wang, Xuelong (1); Wu, Hua (2); Wang, Heqing (3); Zhang, Lu (3); Zhang, Qingpeng (3); Wang, Jing (3)
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Corresponding author: Wang, Hui(wanghui@xsyu.edu.cn)
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Conference location: Xi'an, China
Conference code: 176101
Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE
Abstract: The new generation of network security threats present a mixed and multi-stage attack mode. Using AI technology for accurate detection has gradually become a consensus in the field of network security. The paper briefly describes the background and research status of threat detection and traceability, puts forward a network security threat detection and traceability system based on AI, and designs the overall system architecture of network data acquisition and traffic processing, security threat detection engine, situational awareness and traceability evidence. According to different attack types, AI based detection engine is studied, and threat intelligent detection and location services for cyberspace and application system is developed by using cloud security service platform. Through AI detection, intelligence detection, anomaly detection and traffic gene detection, real-time monitoring, traceability analysis and emergency disposal of network security threats are realized. At the end of the paper, three typical threat detection application scenarios are recommended. © 2021 SPIE
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Main heading: Network security
Controlled terms: Data acquisition - Engines - National security - Security systems - Anomaly detection
Uncontrolled terms: AI Technologies - Multi-stage attack - Networks security - Research status - Security threats - Systems architecture - Threat detection - Threat detection system - Traceability analysis - Traceability systems
Classification code: 404.1 Military Engineering - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 902.3 Legal Aspects - 914.1 Accidents and Accident Prevention
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402. Adaptive spatial regularization for sequential unmixing of hyperspectral images

Accession number: 20211910343152
Authors: Hong, Xiao (1); Hui, Liu (1)
Author affiliation: (1) Xian Shiyou University, School of Computer Science, Xi'an, China
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Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Hyperspectral unmixing is one of the most important tasks in hyperspectral data processing. This work aims to analyze material components coexsiting in low spatial resolution pixels. It is important to integrate both spectral and spatial information to enhance the unmxing performance. Considering that the hyperspectral pixels are usually captured in a sequential manner, an adaptive processing framework is proposed in this paper to efficiently address the unmixing problem with the 11-norm and 12-norm spatial regularization in an online manner. Experiments validated the effectiveness of the proposed methods. © 2021 IEEE.
Number of references: 7
Main heading: Pixels
Controlled terms: Data handling - Spectroscopy
Uncontrolled terms: Adaptive processing - Hyperspectral Data - Hyperspectral unmixing - Material components - Sequential manners - Spatial informations - Spatial regularizations - Spatial resolution
Classification code: 723.2 Data Processing and Image Processing
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Database: Compendex
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403. The Dynamics of the PDGF-driven Tumor Growth

Accession number: 20220811696299
Authors: Guo, Yingmin (1); Zhao, Xiaoping (2); Wang, Wei (3)
Author affiliation: (1) College of Foreign Languages, Xi'An Shiyou University, Xi'an, China; (2) College of Economics and Management, Xi'An Shiyou University, Xi'an, China; (3) College of Sciences, Xi'An Shiyou University, Xi'an, China
Corresponding author: Wang, Wei(wwmath@xsyu.edu.cn)
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Conference date: November 13, 2021 - November 15, 2021
Conference location: Chongqing, China

Conference code: 176292
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Gliomas, the most malignant and common primary brain tumor, can be treated aggressively with surgery, radiotherapy and chemotherapy. In spite of the treatment, recurrence seems inevitable and the improvement in survival has been minimal in the past 50 years. According to the recent studies, recruitment plays a significant and unclear role in human gliomas, and a new mathematical model (proliferative invasive recruitment (PIR) model) has been developed to explore the outcomes of cell recruitment, and it focus on the interaction between PDGF (Platelet-derived growth factor) paracrine signals and glial progenitor cells. Based on this, we used the tool of ODE that takes into account free PDGF in extracellular spaces (ECS), recruited glial progenitor cells, no retrovirus infection, and glial progenitor cell populations infected with retrovirus expressing PDGF, to construct a dynamic system of PDGF driving tumor growth. Finally we use some parameter data to calculate all dynamic characteristics, and use Matlab to carry out some numerical simulations to verify our theoretical results. In this study, statistical methods and mathematical theories were used to construct an auxiliary model to construct a dynamic system of PDGF driven tumor growth. All the dynamic characteristics are numerically calculated by using some parameter values, hoping to bring reference significance to clinical medical research. © 2021 IEEE.
Number of references: 18
Main heading: Chemotherapy
Controlled terms: Cell proliferation - Population statistics - Tumors - Cell culture - Clinical research - MATLAB
Uncontrolled terms: Dynamical modeling - Dynamics characteristic - Equilibrium analysis - Equilibrium solutions - Glial progenitors - New mathematical model - Platelet-derived growth factors - Primary brain tumors - Progenitor cell - Tumor growth
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404. Research on the Application of Big Data in the Petroleum Industry

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Authors: Wang, Hui (1); Wu, Hua (2); Wang, Xuelong (1)
Author affiliation: (1) Information Center, Xi'an Shiyou University, Shaanxi; 710065, China; (2) School of Sciences, Xi'an Shiyou University, Shaanxi; 710065, China
Corresponding author: Wang, Hui(wanghui@xsyu.edu.cn)
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Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE
Abstract: In the past decade, the amount of data in the petroleum industry has increased rapidly, and the demand for data mining has continued to increase. The method of big data analysis can more scientifically guide the exploration and development, oil refining and chemical industry, transportation, storage and marketing of the petroleum industry. This paper briefly describes the big data theory and the development status and problems of the petroleum industry, and puts forward an overall design architecture of big data platform in the petroleum industry, which is divided into five levels, including data source, acquisition technology, storage technology, processing and analysis technology, as well as big data applications in the upstream, midstream and downstream of the petroleum industry. This paper analyzes and summarizes the characteristics of big data in the petroleum industry, studies the common algorithms of supervised learning, unsupervised learning, semi-supervised learning and reinforcement learning in data mining technology, and finally gives six typical application scenarios of the petroleum industry chain. © 2021 SPIE
Number of references: 8
Main heading: Data mining
Controlled terms: Big data - Petroleum transportation - Data handling - Reinforcement learning - Deep learning - Digital storage - Gasoline - Chemical analysis - Petroleum industry
Uncontrolled terms: Big data analyse - Big data applications - Data platform - Data theories - Design architecture - Development problems - Development status - Exploration and development - Oil refining - Overall design
Classification code: 461.4 Ergonomics and Human Factors Engineering - 523 Liquid Fuels - 722.1 Data Storage, Equipment and Techniques - 723.2 Data Processing and Image Processing - 723.4 Artificial Intelligence
DOI: 10.1117/12.2622722
Funding Details: Number: 20200509, Acronym: -, Sponsor: -; Number: 2020ITA07036, Acronym: -, Sponsor: -;
Funding text: This work was supported by Colleges and Universities Association for Science and Technology Young Talents Promotion Plan in Shanxi Province of China (Grant No. 20200509), and Colleges and Universities Industry-University-Research Innovation Fund of China (Grant No. 2020ITA07036).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

405. A fault diagnosis method based on the Support Vector Machine in rod pumping systems (*Open Access*)

Accession number: 20220211446728
Authors: Li, Juanni (1); Shao, Jun (2)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China; (2) Mechanical Engineering College, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China
Corresponding author: Li, Juanni(kikilee@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 2125
Part number: 1 of 1
Issue: 1
Issue title: 2021 4th International Conference on Mechanical, Electrical and Material Application, MEMA 2021
Issue date: November 30, 2021
Publication year: 2021
Article number: 012004
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2021 4th International Conference on Mechanical, Electrical and Material Application, MEMA 2021
Conference date: October 29, 2021 - October 31, 2021
Conference location: Chongqing, China
Conference code: 175795
Publisher: IOP Publishing Ltd

Abstract: Monitoring the working status of the sucker rod pump is an important part in petroleum engineering. With the development of artificial intelligence technology, more methods have been applied to the fault diagnosis of rod pumping systems. An evolutional fault diagnosis method based on Support Vector Machine (SVM) in sucker rod pumping systems is proposed. Fourier descriptors and Light Field compression algorithm are used in this method to extract the graphic features of the indicator diagram. SVM is used to build fault classification model. This method is verified experimentally through data of indicator diagrams and the results show that it has a shorter training time and higher accuracy. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 10
Main heading: Failure analysis
Controlled terms: Oil well pumps - Support vector machines - Fault detection - Pumping plants
Uncontrolled terms: Artificial intelligence technologies - Fault diagnosis method - Faults diagnosis - Fourier descriptors - Indicator diagram - Light fields - Rod pumping systems - Sucker rod pumping - Sucker-rod pumps - Support vectors machine
Classification code: 446 Waterworks - 511.2 Oil Field Equipment - 618.2 Pumps - 723 Computer Software, Data Handling and Applications
DOI: 10.1088/1742-6596/2125/1/012004
Funding Details: Number: 2021GY-084, Acronym: -, Sponsor: -;
Funding text: The authors gratefully acknowledge the financial support from the Key R & D Program in Shaanxi Province (No. 2021GY-084).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

406. Research on the Application of NLP Artificial Intelligence Tools in University Natural Language Processing (*Open Access*)

Accession number: 20211610229045
Authors: Yuan, Aihong (1); Gao, Li (2)
Author affiliation: (1) School of Foreign Languages, Xi'An Shiyou University, Xi'an, China; (2) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Corresponding author: Yuan, Aihong(hyuan@xsyu.edu.cn)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 714
Part number: 4 of 4
Issue: 4
Issue title: 2020 6th International Conference on Environmental Science and Material Application - 3. Green Energy and Power Engineering
Issue date: April 9, 2021
Publication year: 2021
Article number: 042018
Language: English
ISSN: 17551307
E-ISSN: 17551315
Document type: Conference article (CA)
Conference name: 2020 6th International Conference on Environmental Science and Material Application, ESMA 2020
Conference date: December 19, 2020 - December 20, 2020
Conference location: Xi'an, China
Conference code: 168350
Publisher: IOP Publishing Ltd
Abstract: Natural language formal analysis theory has created brilliant achievements on the basis of previous studies. However, with the development of computing power and the advent of the deep learning boom, some people believe that the rule-based rationalist method is outdated, and deep learning that relies on massive data can truly realize artificial intelligence. When traditional natural language is directly transplanted to text language, the short content of natural language will cause data sparseness and result in deviation of calculation results. This paper proposes a new natural language similarity measurement method by using NLP artificial intelligence tools. This method first preprocesses short texts, then builds a complex network model for natural language, calculates the complex network

feature values of natural language words, and then uses NLP artificial intelligence tools to calculate the semantic similarity between natural language words, and then combines natural language Semantic similarity is defined to calculate the similarity between natural languages. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Natural language processing systems
Controlled terms: Complex networks - Semantics - Computation theory - Computing power - Deep learning
Uncontrolled terms: Artificial intelligence tools - Calculation results - Complex network models - NAtural language processing - Natural language semantics - Natural languages - Semantic similarity - Similarity measurements
Classification code: 461.4 Ergonomics and Human Factors Engineering - 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 722 Computer Systems and Equipment - 722.2 Computer Peripheral Equipment - 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing
DOI: 10.1088/1755-1315/714/4/042018
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

407. Research on Multiple Classification Based on Improved SVM Algorithm for Balanced Binary Decision Tree (*Open Access*)

Accession number: 20211710247099
Authors: Xie, Wenhao (1); She, Yanhong (1); Guo, Qiao (2)
Author affiliation: (1) School of Science, Xi'An Shiyou University, Xi'an; 710065, China; (2) College of Petroleum Engineering, Xi'An Shiyou University, Xi'an; 710065, China
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Source title: Scientific Programming
Abbreviated source title: Sci. Program
Volume: 2021
Issue date: 2021
Publication year: 2021
Article number: 5560465
Language: English
ISSN: 10589244
CODEN: SCIPEV
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Support vector machines (SVMs) are designed to solve the binary classification problems at the beginning, but in the real world, there are a lot of multiclassification cases. The multiclassification methods based on SVM are mainly divided into the direct methods and the indirect methods, in which the indirect methods, which consist of multiple binary classifiers integrated in accordance with certain rules to form the multiclassification model, are the most commonly used multiclassification methods at present. In this paper, an improved multiclassification algorithm based on the balanced binary decision tree is proposed, which is called the IBDT-SVM algorithm. In this algorithm, it considers not only the influence of "between-classes distance"and "class variance"in traditional measures of between-classes separability but also takes "between-classes variance"into consideration and proposes a new improved "between-classes separability measure."Based on the new "between-classes separability measure,"it finds out the two classes with the largest between-classes separability measure and uses them as the positive and negative samples to train and learn the classifier. After that, according to the principle of the class-grouping-by-majority, the remaining classes are close to these two classes and merged into the positive samples and the negative samples to train SVM classifier again. For the samples with uneven distribution or sparse distribution, this method can avoid the error caused by the shortest canter distance classification method and overcome the "error accumulation"problem existing in traditional binary decision tree to the greatest extent so as to obtain a better classifier. According to the above algorithm, each layer node of the decision tree is traversed until the output classification result is a single-class label. The experimental results show that the IBDT-SVM algorithm proposed in this paper can achieve better classification accuracy and effectiveness for multiple classification problems. © 2021 Wenhao Xie et al.
Number of references: 26
Main heading: Support vector machines
Controlled terms: Decision trees - Binary trees

Uncontrolled terms: Binary classification problems - Binary decision trees - Classification accuracy - Classification results - Distance classification - Multi-classification algorithms - Multiple Classification - Support vector machine (SVMs)
Classification code: 723 Computer Software, Data Handling and Applications - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
DOI: 10.1155/2021/5560465
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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408. On generalization reducts in multi-scale decision tables

Accession number: 20210209752269
Authors: She, Yan-Hong (1); Qian, Zhuo-Hao (2); He, Xiao-Li (1); Wang, Jun-Tao (1); Qian, Ting (1); Zheng, Wen-Li (1)
Author affiliation: (1) College of Science, Xi'an Shiyou University, Xi'an; 710065, China; (2) College of Computer Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: She, Yan-Hong(yanhongshe@xsyu.edu.cn)
Source title: Information Sciences
Abbreviated source title: Inf Sci
Volume: 555
Issue date: May 2021
Publication year: 2021
Pages: 104-124
Language: English
ISSN: 00200255
CODEN: ISIJBC
Document type: Journal article (JA)
Publisher: Elsevier Inc.
Abstract: Real-world data is often organized at different levels of granularity with specified concept hierarchies. Multi-scale information tables represent such a type of data set in a hierarchical form. In this paper, we aim to focus on rule extraction in multi-scale decision tables. Unlike the case of attribute reduct, we consider a type of generalization reduct in multi-scale decision tables. This approach requires both the least number of attributes and the coarsest level of scales according to different reduct standards. The present study is conducted at the three different levels, that is, generalization reducts for objects, decision rules and multi-scale decision tables, respectively. The construction of granularity trees and the selection of cuts play a crucial role. At each level, we present various types of generalization reducts according to different requirements. The relationship between them is also investigated. Moreover, a comparative study between generalization reducts and attribute reducts is also performed. Based on the notion of generalization reducts, the procedure to extract the set of optimal decision rule in multi-scale decision tables is provided and an illustrative example is also given to show the proposed approach. © 2020 Elsevier Inc.
Number of references: 33
Main heading: Decision tables
Controlled terms: Forestry
Uncontrolled terms: Attribute reduct - Comparative studies - Concept hierarchies - Decision rules - Multi-scale informations - Optimal decision-rule - Real-world - Rule extraction
Classification code: 723.1 Computer Programming - 821 Agricultural Equipment and Methods; Vegetation and Pest Control
DOI: 10.1016/j.ins.2020.12.045
Funding Details: Number: 11531009,11801440,12001422,12001423,61976244, Acronym: -, Sponsor: -; Number: 2020JQ-762, Acronym: -, Sponsor: -; Number: 19JK0653, Acronym: -, Sponsor: -;
Funding text: This work is supported by the National Nature Science Foundation of China (Nos. 61976244, 12001422, 12001423, 11801440 and 11531009), the National Nature Science Foundation of Shaanxi Province (No. 2020JQ-762) and the Natural Science Foundation of Education Committee of Shannxi Province (No. 19JK0653)
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

409. Application of Configuration Force to Dynamic Crack of Shale under Hydration (*Open Access*)

Accession number: 20214010984527
Authors: Fan, Heng (1); Zhao, Xiaojiao (1); Ji, Yu (1); Zhao, Zhifeng (1); Qu, Zhan (2)
Author affiliation: (1) Safety Engineering, Xi'An Shiyou University, Dianzi No. 2 Road, Xi'an, China; (2) Petroleum Engineering, Xi'An Shiyou University, Dianzi No. 2 Road, Xi'an, China
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Source title: Mathematical Problems in Engineering
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Volume: 2021
Issue date: 2021
Publication year: 2021
Article number: 5588701
Language: English
ISSN: 1024123X
E-ISSN: 15635147
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: The natural microdefects of shale and the expansion of microcracks under hydration and overlying rock loadings are important for the wellbore stability. According to the conservation of energy, the force of the microdefects and microcracks under finite deformation is studied by the method of configuration force through the migrating control volume in the spatial observer. Under the hydration stress and rock pressure, the equation of hydration stress and its work in reference configuration has been obtained, and the equations of configuration forces and configuration moment have been established as a consequence of invariance under changes. The relationship between the configuration and deformation forces is determined by the second law. The energy dissipation equation of the crack tip has been deduced, which shows that the projection of the concentrated internal configuration body force at the crack tip in the opposite direction of the crack is equal to the energy dissipation of the crack tip per unit length. The inertial and internal parts of the concentrated configuration body force at the crack tip have been derived; it is indicated that the internal configuration force plays a leading role in the irreversible fracture process. Moreover, the energy release rate of shale under hydration is proved to depend on constitutive responses and hydration stress. In the theoretical system of configuration force, the migrating control volume at the crack tip contains inclusions, microcracks, microvoids, and heterogeneity of the rock itself. We use the configuration force theory to solve the problem of rock crack propagation and rock fracture. The factors considered are more comprehensive, which can better reflect the actual situation and provide a theoretical basis for the study of wellbore stability. © 2021 Heng Fan et al.
Number of references: 45
Main heading: Crack tips
Controlled terms: Hydration - Energy dissipation - Boreholes - Shale - Crack propagation - Deformation - Microcracks - Oil field equipment
Uncontrolled terms: Body forces - Conservation of energy - Control volumes - Deformation forces - Dynamic cracks - Finite deformations - Hydration stress - Micro-defects - Second law - Wellbore stability
Classification code: 511.2 Oil Field Equipment - 525.4 Energy Losses (industrial and residential) - 951 Materials Science
DOI: 10.1155/2021/5588701
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

410. A Clustering Ensemble Algorithm of Computing Stability of Sample Points Based on Neighborhood

Accession number: 20220411523894
Authors: Lou, TongLing (1)
Author affiliation: (1) Xi'an Shiyou University, Xian, China
Corresponding author: Lou, TongLing(1323635455@qq.com)
Source title: Proceedings - 2021 2nd International Symposium on Computer Engineering and Intelligent Communications, ISCEIC 2021
Abbreviated source title: Proc. - Int. Symp. Comput. Eng. Intell. Commun., ISCEIC
Part number: 1 of 1

Issue title: Proceedings - 2021 2nd International Symposium on Computer Engineering and Intelligent Communications, ISCEIC 2021
Issue date: 2021
Publication year: 2021
Pages: 34-37
Language: English
ISBN-13: 9781665441605
Document type: Conference article (CA)
Conference name: 2nd International Symposium on Computer Engineering and Intelligent Communications, ISCEIC 2021
Conference date: August 6, 2021 - August 8, 2021
Conference location: Nanjing, China
Conference code: 174292
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In the process of clustering ensemble, different sample points play different roles in the ensemble results, and the certainty of each sample point in the distribution to each cluster is also different. In order to reduce the impact of this uncertainty on clustering results, some scholars proposed the concept of sample stability. In this paper, we propose to calculate the stability of sample points by calculating the probability of the occurrence of sample points and sample points in their neighborhood in the same cluster of different base clusters, and propose an algorithm framework based on this calculation method. In this paper, the original data are first clustered to calculate the Mahalanobis distance between the sample points. Then, the co-occurrence probability of the target sample point and its nearest K sample points is calculated. According to the cooccurrence probability, the stability of each sample point is calculated. First, the stable sample points are hard clustered, and then the unstable sample points are assigned to the nearest cluster. The effectiveness of the proposed clustering ensemble algorithm is verified on benchmark datasets. © 2021 IEEE.
Number of references: 16
Main heading: Stability
Controlled terms: Probability - Machine learning - Clustering algorithms
Uncontrolled terms: Algorithm framework - Clustering Ensemble - Clustering results - Co-occurrence probability - Component - Ensemble algorithms - Neighbourhood - Point-based - Sample point - Uncertainty
Classification code: 723.4 Artificial Intelligence - 903.1 Information Sources and Analysis - 922.1 Probability Theory
DOI: 10.1109/ISCEIC53685.2021.00015
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

411. A new interpolation approach and corresponding instance-based learning

Accession number: 20210273291
Authors: Lian, Shiyou (1)
Author affiliation: (1) Xi'an Shiyou University, Xi'an, China
Corresponding author: Lian, Shiyou(sylian@xsyu.edu.cn)
Source title: arXiv
Abbreviated source title: arXiv
Issue date: August 25, 2021
Publication year: 2021
Language: English
E-ISSN: 23318422
Document type: Preprint (PP)
Publisher: arXiv
Abstract: Starting from finding approximate value of a function, introduces the measure of approximation-degree between two numerical values, proposes the concepts of "strict approximation" and "strict approximation region", then, derives the corresponding one-dimensional interpolation methods and formulas, and then presents a calculation model called "sum-times-difference formula" for high-dimensional interpolation, thus develops a new interpolation approach - ADB interpolation. ADB interpolation is applied to the interpolation of actual functions with satisfactory results. Viewed from principle and effect, the interpolation approach is of novel idea, and has the advantages of simple calculation, stable accuracy, facilitating parallel processing, very suiting for high-dimensional interpolation, and easy to be extended to the interpolation of vector valued functions. Applying the approach to instance-based learning, a new instance-based learning method - learning using ADB interpolation - is obtained. The learning method is of unique technique, which has also the advantages of definite mathematical basis, implicit distance weights, avoiding misclassification,

high efficiency, and wide range of applications, as well as being interpretable, etc. In principle, this method is a kind of learning by analogy, which and the deep learning that belongs to inductive learning can complement each other, and for some problems, the two can even have an effect of "different approaches but equal results" in big data and cloud computing environment. Thus, the learning using ADB interpolation can also be regarded as a kind of "wide learning" that is dual to deep learning. © 2021, CC BY-NC-SA.
Number of references: 9
Main heading: Interpolation
Controlled terms: Deep learning - Numerical methods
Uncontrolled terms: Approximation degrees - High-dimensional - Higher-dimensional - Instance-Based Learning - Learning methods - Numerical values - Strict approximation - Sum-time-difference formula - Time-differences - Wide learning
Classification code: 461.4 Ergonomics and Human Factors Engineering - 921.6 Numerical Methods
Preprint ID: 2108.11530v1
Preprint source website: https://arxiv.org
Preprint ID type: ARXIV
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

412. Analysis and Design of intelligent license Plate recognition system

Accession number: 20211910343167
Authors: Han, Jiang (1); Bo, Han Yu (1)
Author affiliation: (1) Xi'an Shiyou University, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 1079-1082
Article number: 9408766
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The research content of this paper is to use Opencv to design an intelligent license plate recognition system based on MFC framework. The specific operation method is to collect vehicle photos by camera, and then use the license plate area detection algorithm to locate the specific location of the license plate. Next the license plate is divided into specific letters and numbers by segmentation algorithm. Finally the license plate will be trained by character template characteristic value. © 2021 IEEE.
Number of references: 7
Main heading: License plates (automobile)
Controlled terms: Image segmentation - Optical character recognition
Uncontrolled terms: Area detection - Character template - Characteristic value - License plate recognition systems - Operation methods - Segmentation algorithms - Specific location
Classification code: 662.1 Automobiles - 741.1 Light/Optics
DOI: 10.1109/ICSP51882.2021.9408766
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

413. Synthesis of castor oil-based lubricant pour point depressant

Accession number: 20211410179150
Title of translation:

Authors: Ding, Liqin (1); Nian, Lili (1); Feng, Hao (1); Liang, Shengrong (2)
Author affiliation: (1) College of Chemistry & Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Modern Analysis & Testing Center, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Jingxi Huagong/Fine Chemicals
Abbreviated source title: Jingxi Huagong
Volume: 38
Issue: 3
Issue date: March 15, 2021
Publication year: 2021
Pages: 619-624
Language: Chinese
ISSN: 10035214
CODEN: JIHUFJ
Document type: Journal article (JA)
Publisher: Fine Chemicals
Abstract: Castor oil-methyl methacrylate copolymer was synthesized from castor oil (CO) and methyl methacrylate (MMA) by using azodiisobutyronitrile (AIBN) as initiator, toluene as solvent under an anhydrous and anaerobic condition. The structure of copolymer was characterized by FTIR. The relative molecular mass and its distribution of the copolymer were determined by gel permeation chromatography (GPC). The performance of its pour point depression was also evaluated. The results showed that under the conditions of m(CO):m(MMA)=1:1, AIBN dosage of 0.25% (based on the total mass of monomers, the same below), at 80 for 8 h, the copolymer had a yield of 59.20%, average relative molecular weight of 2.722×105 and exhibited narrow relative molecular weight distribution (PDI=1.51). When the additive amount of copolymer was 0.5% (based on the mass of oil product, the same below), the pour point of the lubricating oil could decreased by 10, indicating that the copolymer had a certain effect of lowering pour points (#SP=10). © 2021, Editorial Office of FINE CHEMICALS. All right reserved.
Number of references: 29
Main heading: Organic solvents
Controlled terms: Gel permeation chromatography - Molecular weight distribution - Oil fields - Morphology - Esters - Vegetable oils
Uncontrolled terms: Anaerobic conditions - Gel permeation chromatography (GPC) - Methyl methacrylate copolymers - Methyl methacrylates - Oil product - Pour point depressants - Pour points - Relative molecular mass
Classification code: 512.1.1 Oil Fields - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 931.3 Atomic and Molecular Physics - 951 Materials Science
Numerical data indexing: Percentage 2.50e-01%, Percentage 5.00e-01%, Percentage 5.92e+01%, Time 2.88e+04s
DOI: 10.13550/j.jxhg.20200747
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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414. Design and Analysis of the Virtual Simulation Experiment System of Zeeman Effect

Accession number: 20220411514903
Authors: Li, Xiaoli (1); Chen, Guoxiang (1); Hui, Qiannan (1)
Author affiliation: (1) Xi'an Shiyou University, Shannxi, Xi'an, China
Corresponding author: Li, Xiaoli(lixiaoli@xsyu.edu.cn)
Source title: Proceedings of SPIE - The International Society for Optical Engineering
Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 12079
Part number: 1 of 1
Issue title: Second IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
Issue date: 2021
Publication year: 2021
Article number: 120790S
Language: English
ISSN: 0277786X
E-ISSN: 1996756X
CODEN: PSISDG
ISBN-13: 9781510650329

Document type: Conference article (CA)
Conference name: 2nd IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
Conference date: October 8, 2021 - October 10, 2021
Conference location: Xi'an, China
Conference code: 176101
Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE
Abstract: This paper relates to a set of virtual simulation experiment system of the Zeeman effect developed according to the teaching requirements for the Zeeman effect experiment. The corresponding relationship among changes in the magnetic field, optical elements and Zeeman split spectral lines can be intuitively observed from the interface of the system. The system can help observe the Zeeman effect and study the atomic energy level structure so as to obtain better experimental teaching effect, shorter experiment duration and higher utilization rate and safety of the equipment.
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Number of references: 6
Main heading: E-learning
Controlled terms: Spectroscopy - Image processing
Uncontrolled terms: Atomic energy levels - Design and analysis - Experimental teachings - Magnetic-field - Simulation experiment systems - Spectral line - Virtual simulation experiment - Virtual simulations - Zeeman effect - Zeeman split
Classification code: 723.2 Data Processing and Image Processing
DOI: 10.1117/12.2623441
Funding Details: Number: XBY202112,XBZ202110, Acronym: -, Sponsor: -;
Funding text: This article is one of the phased research results of Research project of education and teaching reform in Xi 'an Shiyou University in 2021 : Research on open experimental teaching system based on experimental teaching sharing platform(Number:XBY202112), Exploration and practice of practical teaching of photoelectric information science and engineering under the background of first-class specialty construction(Number:XBZ202110).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

415. Strategy on the Service Mode of University Library to Help Users Cope with the False Information under the We Media Environment

Accession number: 20212210419545
Authors: Qiming, Shi (1); Wei, Zhang (1); Rongli, Hou (1); Yixuan, Lei (1)
Author affiliation: (1) Library, Xi'an Shiyou University, Xi'an, China
Source title: 2021 9th International Conference on Information and Education Technology, ICIET 2021
Abbreviated source title: Int. Conf. Inf. Educ. Technol., ICIET
Part number: 1 of 1
Issue title: 2021 9th International Conference on Information and Education Technology, ICIET 2021
Issue date: March 27, 2021
Publication year: 2021
Pages: 369-373
Article number: 9419601
Language: English
ISBN-13: 9781665419338
Document type: Conference article (CA)
Conference name: 9th International Conference on Information and Education Technology, ICIET 2021
Conference date: March 27, 2021 - March 29, 2021
Conference location: Okayama, Japan
Conference code: 168857
Sponsor: IEEE; International Academy of Computing Technology; Okayama University; South China Normal University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: By setting up the media literacy MOOC, organizing and implementing the 'information falsification' practice project designed based on Laswell's '5W communication model' and critical thinking concept, establishing a scientific

evaluation system of user information identification ability, the University Library provides the resources and tools for users to identify false information under the we media environment, helps users improve media information literacy to deal with false information. This paper puts forward the service mode of university library to help users cope with the false information under the we media environment. © 2021 IEEE.
Number of references: 12
Main heading: Libraries
Uncontrolled terms: Communication modeling - Critical thinking - Information literacy - Practice projects - Scientific evaluations - Service mode - University libraries - User information
Classification code: 903.4.1 Libraries
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Funding Details: Number: 191001, Acronym: -, Sponsor: -; Number: ld201903, Acronym: -, Sponsor: -;
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416. Bonding mechanism on TGDDM/CF and the influences of functional groups and interfacial water: An MD and DFT investigation

Accession number: 20204109323355
Authors: Li, Jian (1); Zhao, Junyu (1); Zhang, Ming (2); Cui, Youming (1); Kou, Di (1)
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Corresponding author: Li, Jian(lijian@xsyu.edu.cn)
Source title: Applied Surface Science
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Article number: 148049
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Bonding mechanism between tetraglycidyl diamino diphenyl methane (TGDDM) epoxy resin and carbon fiber (CF) is investigated by employing MD and DFT methods. Edge sites of CF surface (CF(1 0 0) and (1 1 0)) are focused due to they are chemically active than the inert basal planes. Two kinds functional groups (OH and COOH) are anchored on these sites, and the impacts of interfacial water are examined. The most negative adsorption energy (Ead) goes to the model of TGDDM absorbed onto COOH-functionalized CF(1 1 0) (noted as CF(1 1 0)COOH). Mulliken population analysis implies that O-H hydrogen bonds have formed across the interface. More bonds tend to form with CF(1 1 0) surface and COOH groups. The energy per each hydrogen bond is around 25.9531.07 kJ/mol, and bond length ranges around 1.812.49 Å, which are consistent with previous reports. For the interfacial bonds associated with OH-functionalizaion, TGDDM and OH groups are hydrogen acceptors and donors, respectively. While for the cases with COOH groups, both the TGDDM and COOH groups can act as either acceptors, or donors. Caused by interfacial water, the interfacial hydrogen bonds will be detached, and the interaction energy (Eint) between TGDDM-CF(1 1 0) decreases 84.04%. Meanwhile, new hydrogen bonds will form between H2O-TGDDM (and H2O-CF). © 2020 Elsevier B.V.
Number of references: 53
Main heading: Molecular dynamics
Controlled terms: Carbon fibers - Bond length - Density functional theory - Epoxy resins - Hydrogen bonds
Uncontrolled terms: Bonding mechanism - Functionalized - Hydrogen acceptor - Interaction energies - Interfacial bonds - Interfacial water - Mulliken population analysis - Negative adsorption
Classification code: 801.4 Physical Chemistry - 804 Chemical Products Generally - 815.1.1 Organic Polymers - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
Numerical data indexing: Percentage 8.40e+01%
DOI: 10.1016/j.apsusc.2020.148049

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Funding text: The authors acknowledge the financial support for the research from the Natural Science Foundation of Shaanxi Province (Program no. 2019JM-388), and the Youth Innovation Team of Xian Shiyou University (Program no. 2019QNKYCXTD04). The authors also acknowledge the support from the Center for High Performance Computing of Northwestern Polytechnical University. During the revising process, the discussion and advices from Yi Jiang and Lili Lin are also gratefully appreciated.
Compendex references: YES
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417. Controllable Synthesis of Lauryl Methacrylate-Stearyl Methyl Acrylate Copolymer and Its Pour Point Depression Performance

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Title of translation: -
Authors: Ding, Liqin (1); Feng, Hao (1); Guo, Xiao (1); Liang, Shengrong (2); Li, Hong (1)
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Abbreviated source title: Shiyou Xuebao Shiyou Jiagong
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Pages: 593-600
Language: Chinese
ISSN: 10018719
CODEN: SXSHEY
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Poly (lauryl methacrylate-stearyl methyl acrylate) (PHMA) was controllably synthesized with Salen-Ni-Salicylaldehyde/azodiisobutyronitrile (AIBN) catalyst system by solution polymerization in the toluene through a Schlenk device. The structure of PHMA was characterized by FT-IR and 1H NMR. Meanwhile, the relative molecular mass and its distribution of the copolymer were determined by gel permeation chromatography (GPC). In addition, the performance of the synthesized pour point depressant was evaluated. Experimental results show that the optimum synthetic conditions are: lauryl methacrylate to stearyl methyl acrylate molar ratio 5: 1, co-catalyst (AIBN) to catalyst (Salen-Ni-Salicylaldehyde) molar ratio 6: 1, reaction temperature 90, reaction time 10 h, and total monomer to catalyst molar ratio 3600: 1. Under the above conditions, catalyst activity can be 11.035×104 g/(mol•h). Relative molecular mass of the synthesized polymer is in the range of 0.864×105-2.532×105. When 0.5% mass fraction synthesized copolymer was added, pour point of diesel fraction (300-350) and lubricant fraction (380-400) could decrease 7-10 and 10-15, respectively. It was also found that pour point depression performance of copolymer is better than that of blend polymer. © 2021, Editorial Office of Acta Petrolei Sinica(Petroleum Processing Section). All right reserved.
Number of references: 14
Main heading: Gel permeation chromatography
Controlled terms: Molar ratio - Molecular mass - Catalyst activity - Acrylic monomers
Uncontrolled terms: Controllable synthesis - Gel permeation chromatography (GPC) - Optimum synthetic condition - Pour point depressants - Reaction temperature - Relative molecular mass - Solution polymerization - Synthesized polymers
Classification code: 801 Chemistry - 801.4 Physical Chemistry - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Percentage 5.00e-01%, Time 3.60e+04s
DOI: 10.3969/j.issn.1001-8719.2021.03.014
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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418. Image processing of Casting defects based on Convolutional neural network (*Open Access*)

Accession number: 20220411535617
Authors: Wei, Bowen (1, 2); Gao, Weixin (1, 2)
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Issue title: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
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Publication year: 2021
Article number: 012059
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Conference name: 2021 5th International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2021
Conference date: October 29, 2021 - October 31, 2021
Conference location: Xi'an, Virtual, China
Conference code: 176003
Publisher: IOP Publishing Ltd
Abstract: At present, there are numerous losses caused by corrosion cracking of metal castings in engineering in China. In order to detect the possible defects of metal castings in engineering, the laser ultrasonic vision inspection technology is used to image the castings, and then the identification efficiency is low. In order to process these images efficiently and quickly, convolutional neural network image processing technology is introduced. According to the actual needs, a convolutional neural network architecture is designed to recognize images, and whether the architecture meets the requirements is verified. Experimental results show that the performance of the architecture meets the design requirements. Under the same conditions, this structure provides a solution for casting defect detection combined with artificial intelligence. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 5
DOI: 10.1088/1742-6596/2137/1/012059
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Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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419. GANBLR: A Tabular Data Generation Model

Accession number: 20220911711574
Authors: Zhang, Yishuo (1); Zaidi, Nayyar A. (1); Zhou, Jiahui (2); Li, Gang (1)
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Abbreviated source title: Proc. IEEE Int. Conf. Data Min. ICDM
Volume: 2021-December
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Conference location: Virtual, Online, New zealand
Conference code: 176603
Sponsor: Google; IEEE Technical Committee on Intelligent Informatics; School of Computer Science - The University of Auckland; Two Sigma; US National Science Foundation (NSF)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Generative Adversarial Network (GAN) models have shown to be effective in a wide range of machine learning applications, and tabular data generation process has not been an exception. Notably, some state-of-the-art models of tabular data generation, such as CTGAN, TableGan, MedGAN, etc. are based on GAN models. Even though these models have resulted in superiour performance in generating artificial data when trained on a range of datasets, there is a lot of room (and desire) for improvement. Not to mention that existing methods do have some weaknesses other than performance. E.g., the current methods focus only on the performance of the model, and limited emphasis is given to the interpretation of the model. Secondly, the current models operate on raw features only, and hence they fail to exploit any prior knowledge on explicit feature interactions that can be utilized during data generation process. To alleviate the two above-mentioned limitations, in this work, we propose a novel tabular data generation model- Generative Adversarial Network modelling inspired from Naive Bayes and Logistic Regression's relationship (GANBLR), which can not only address the interpretation limitation in existing tabular GAN-based models but can provide capability to handle explicit feature interactions. By extensively evaluating on wide range of datasets, we demonstrate GANBLR'S superiour performance as well as better interpretable capability (explanation of feature importance in the synthetic generation process) as compared to existing state-of-the-art tabular data generation models. © 2021 IEEE.
Number of references: 21
Main heading: Generative adversarial networks
Controlled terms: Bayesian networks - Classifiers
Uncontrolled terms: Bayesia n networks - Data generation - Data generation models - Generation process - Logistics regressions - Naive bayes - Network models - Performance - State of the art - Tabular data
Classification code: 723.4 Artificial Intelligence - 802.1 Chemical Plants and Equipment - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.1109/ICDM51629.2021.00103
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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420. Practice and exploration of online teaching mode for university education

Accession number: 20213510822966
Authors: Liu, Zhenhua (1)
Author affiliation: (1) Mechanical Engineering College, Xi'An Shiyou University, Xi'an, China
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Article number: 3465873
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Conference name: 6th International Conference on Information Management and Technology, CIMTECH 2021

Conference date: August 19, 2021 - August 20, 2021
Conference location: Jakarta, Indonesia
Conference code: 171281
Publisher: Association for Computing Machinery
Abstract: The development of network technology promotes the rise of online teaching mode. Since the COVID-19 outbreak, online teaching has played an important role. There are obvious differences between online and offline teaching modes. According to the characteristics of online teaching environment, teachers can explore and practice in all aspects of teaching process. By improving online teaching work, better teaching effect can be achieved. © 2021 ACM.
Number of references: 11
Main heading: COVID-19
Controlled terms: E-learning
Uncontrolled terms: Network technologies - Offline - Online teaching - Online teaching modes - Teaching effects - Teaching modes - Teaching process - University education
Classification code: 461.7 Health Care
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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421. Comprehensive Evaluation Model of Elective Subjects' Performance in the College Entrance Examination Based on Entropy Weight TOPSIS

Accession number: 20211910343267
Authors: Yingzhuo, Xu (1); Yingmin, Tian (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computing, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: After the reform of the College Entrance Examination, students need to independently determine the selected subjects (that is, choose the three subjects with the best comprehensive results from the candidate subjects of different test content and difficulty). This paper proposed a kind of college entrance examination selection based on the entropy TOPSIS method comprehensive evaluation model of test subject performance. The construction of the model combined the subject correlation and selected 9 evaluation indexes such as the average score of the required test, the optional test subject, the mean Z score, and the variance. The entropy weight method is used to determine the index weight, and the TOPSIS method is used to calculate the scores of students in the selected subjects. The closeness of the positive ideal solution, so that students can quickly determine their selected subjects according to the closeness. Finally, the model is applied to the evaluation of actual scores, and the results show that the built model has good applicability and can provide reliable decision support for students to choose subjects. © 2021 IEEE.
Number of references: 7
Main heading: Students
Controlled terms: Decision support systems
Uncontrolled terms: Comprehensive evaluation model - Decision supports - Entrance examination - Entropy weight method - Entropy weights - Evaluation index - Ideal solutions - Selection based
Classification code: 723 Computer Software, Data Handling and Applications - 912.2 Management
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422. An Ultra-wideband Filter Using Spoof Surface Plasmon Polaritons Waveguide

Accession number: 20211910343133
Authors: Shi, Xiaomin (1); Wang, Chenhao (1); Zhang, Yan (1); Zhao, Chuanyuan (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer, Xi'an, China
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Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This work presents an ultra-wideband bandpass filter based on spoof surface plasmon polaritons (SSPP) waveguide. The low-pass characteristic is achieved by SSPP waveguide that SSPPs unit consists of corrugated metallic strip with rectangular grooves. A vertical planar capacitor is placed in the center of the filter to couple the surface waves of SSPPs waveguides on both sides of the dielectric substrate, so as to introduce the high-pass characteristics. A design example is used to illustrate the method of ultra-wideband bandpass filter. The high and low cut-off frequencies can be controlled by the groove depth of SSPPs unit and planar capacitor. The simulated result shows the extremely wide -3dB bandwidth from 2GHz to 24GHz with -2 dB insertion loss. The proposed filter provides a potential ultra-wideband application in microwave and terahertz systems. © 2021 IEEE.
Number of references: 15
Main heading: Bandpass filters
Controlled terms: Ultra-wideband (UWB) - Phonons - Surface waves - Electromagnetic wave polarization - Photons - Surface plasmon resonance - Dielectric materials - Waveguide filters
Uncontrolled terms: Dielectric substrates - High pass characteristics - Planar capacitors - Rectangular groove - Spoof surface plasmons - Ultra-wideband bandpass filters - Ultra-wideband filters - Ultrawideband applications
Classification code: 703.2 Electric Filters - 708.1 Dielectric Materials - 711 Electromagnetic Waves - 714.3 Waveguides - 716.3 Radio Systems and Equipment - 931.3 Atomic and Molecular Physics
Numerical data indexing: Decibel -2.00e+00dB, Decibel -3.00e+00dB, Frequency 2.00e+09Hz to 2.40e+10Hz
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423. Optimization of intermittent oil production pattern based on data mining technology

Accession number: 20213510848120
Authors: Sun, Wen (1); Ren, Tao (1); Zhang, Xin (1); Song, Hong (1)
Author affiliation: (1) Mechanical Engineering College, Xi'An Shiyou University, Xi'an, China
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to reduce production cost, intermittent oil production pattern is often used for low permeability oil wells. It is very important to establish the reasonable working system of intermittent oil production. In this paper, based on the data mining technology, through the regression analysis of monadic nonlinear equation, the mathematical model of the change of the dynamic liquid level height with time in intermittent shutdown period and intermittent pumping period are established respectively. According to the maximum production efficiency per unit time, the oil production index is determined. The particle swarm optimization algorithm is used to optimize the shutdown time of pump and determine the intermittent oil production pattern. Compared with the oil production index of other intermittent oil production patterns, this method has better oil production efficiency and higher economic benefits. © 2021 IEEE.
Number of references: 13
Main heading: Data mining
Controlled terms: Mechanical permeability - Regression analysis - Particle swarm optimization (PSO) - Production efficiency
Uncontrolled terms: Data mining technology - Dynamic liquid levels - Economic benefits - Intermittent pumping - Low permeability oil - Particle swarm optimization algorithm - Production efficiency - Working systems
Classification code: 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 913 Production Planning and Control; Manufacturing - 913.4 Manufacturing - 921.5 Optimization Techniques - 922.2 Mathematical Statistics
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424. Design and Test of Downhole Weight on Bit-Based Autodriller System for Horizontal Well (*Open Access*)

Accession number: 20212110392494
Authors: Wu, Zebing (1); Zhang, Wenchao (1); Zhou, Kefei (1); Zhao, Haichao (1); Huang, Hai (1); Wang, Jie (1)
Author affiliation: (1) Mechanical Engineering College, Xi'An Shiyou University, Xi'an, China
Corresponding author: Wu, Zebing(zbwu@xsyu.edu.com)
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: During horizontal well drilling, the pressure difference between the downhole weight on bit (DWOB) and the surface weight on bit (SWOB) will affect the service life of the drilling tool and the efficient production of oil and gas fields. An automatic drilling system device based on DWOB is designed. Choose the S7-200 smart PLC with good expansibility, combine the drilling rig automation principle, and use the Smart-700IE-V3 touch screen to design the human-computer interaction interface. Realize the real-time monitoring and prediction of DWOB. A large amount of test data shows that the new system not only has the advantages of the conventional automatic drilling system, but also can reduce or even eliminate the pressure difference between the surface and the bottom of the hole, achieve accurate control of the DWOB, improve bit performance, and reduce drilling costs. © Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Touch screens
Controlled terms: Automation - Gas industry - Human computer interaction - Horizontal wells - Oil well drilling - Infill drilling
Uncontrolled terms: Automatic drilling - Design and tests - Human computer interaction interface - Oil and gas fields - Pressure differences - Real time monitoring - Rig automation - Weight on bits
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 522 Gas Fuels - 722.2 Computer Peripheral Equipment - 731 Automatic Control Principles and Applications
DOI: 10.1088/1742-6596/1894/1/012032
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Funding text: Thanks for the funding of the Shaanxi Provincial Key R&D Program Project "Research on the Rock Breaking Mechanism and Performance Evaluation Method of Hybrid Bits for Shaanxi Shale Gas exploitation" (No. 2018KW-12). Thanks to the support from the School of Mechanical Engineering, Xi'an Shiyou University.
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425. Electronic and adsorption properties of the zigzag-edged triangle graphene nanosheets

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Authors: Ding, Jijun (1); Jin, Yanxin (1); Chen, Haixia (1)
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Corresponding author: Ding, Jijun(dingjj303@163.com)
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Volume: 121
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Article number: e26607
Language: English
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CODEN: IJQCB2
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc

Abstract: The electronic and adsorption properties of the zigzag-edged triangle graphene nanosheets with different size are investigated, including the calculation of the adsorption energy, sensitivity and recovery time after adsorbing CO2, NO2, CH4 and CO. The results show that the quantum size effect is satisfied in the triangle graphene nanosheets, and its conductivity type can be changed from p to n. In addition, the triangle graphene nanosheets with n = 5 has the highest sensitivity to NO2 (374.79%), which is more than 300 times as compared to the lowest one. The recovery time of triangle graphene nanosheets with n = 4 is the shortest, and its sensitivity and recovery time are the best at 144 K. These results reveal that the zigzag-edged triangular graphene nanosheets can serve as the fundamental structural unit for the design of high sensitivity gas sensors. © 2021 Wiley Periodicals LLC.
Number of references: 30
Main heading: Electronic properties
Controlled terms: Graphene - Nanosheets - Recovery - Adsorption - Nitrogen oxides
Uncontrolled terms: Adsorption energies - Adsorption properties - Different sizes - Graphene nanosheets - High sensitivity gas sensor - Quantum size effects - Recovery time - Structural unit
Classification code: 761 Nanotechnology - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 933 Solid State Physics
Numerical data indexing: Percentage 3.75e+02%, Temperature 1.44e+02K
DOI: 10.1002/qua.26607
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Compendex references: YES
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426. A multispectral image based object detection approach in natural scene

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Authors: Zhao, Chuanyuan (1); Li, Xiangjuan (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer, Xi'an, China
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In this paper, we investigate the feasibility of blueberry detection based on multispectral image, and build robust classification models, which tolerate outdoor illumination changes and complicated background information. In the fruit growth, there are three stages, mature, near mature, and young. Base on the multispectral image and the normalized vegetation index NDVI, we construct a classifier to detect the different growth stage of the fruits by analyzing the color component and using the C4.5 algorithm. The experimental results show that the correct recognition rate of the mature, approximate mature and immature fruit are 74.58%, 79.91% and 86.52%, respectively, which demonstrate that the proposed classifier has a better recognition effect for immature fruits. © 2021 IEEE.
Number of references: 12
Main heading: Computer vision

Controlled terms: Data handling - Data mining - Object detection - Classification (of information) - Fruits
Uncontrolled terms: Background information - Color component - Detection approach - Different growth stages - Illumination changes - Multispectral images - Robust classification - Vegetation index
Classification code: 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 741.2 Vision - 821.4 Agricultural Products - 903.1 Information Sources and Analysis
Numerical data indexing: Percentage 7.99e+01%, Percentage 8.65e+01%, Percentage 7.46e+01%
DOI: 10.1109/ICSP51882.2021.9408975
Funding Details: Number: 20JK0832, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: Ac k n o w l ed g men t This work was supported in part Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 20JK0832).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

427. Constructing teaching system based on javamail

Accession number: 20214911289038
Authors: Wang, Wei (1)
Author affiliation: (1) School of Science, Xi'An Shiyou University, Xi'an, China
Corresponding author: Wang, Wei(wangwei_sci@xsyu.edu.cn)
Source title: ACM International Conference Proceeding Series
Abbreviated source title: ACM Int. Conf. Proc. Ser.
Part number: 1 of 1
Issue title: Proceedings of 2021 4th International Conference on Information Systems and Computer Aided Education, ICISCAE 2021
Issue date: September 24, 2021
Publication year: 2021
Pages: 1050-1053
Language: English
ISBN-13: 9781450390255
Document type: Conference article (CA)
Conference name: 4th International Conference on Information Systems and Computer Aided Education, ICISCAE 2021
Conference date: September 24, 2021 - September 26, 2021
Conference location: Dalian, China
Conference code: 174667
Publisher: Association for Computing Machinery
Abstract: With the rise of online teaching and mobile teaching, various information technologies are used in the online teaching process. As a mature communication technology, e-mail is also used in all aspects of teaching. The e-mail-based teaching application is introduced in this article. First, the framework of the teaching application is described, and then the function and realization of each part of the framework are described in detail. © 2021 ACM.
Number of references: 10
Main heading: Electronic mail
Controlled terms: E-learning
Uncontrolled terms: Communicationtechnology - Email communication - Email communication technology - Javamail - Mobile teaching - Online teaching - Teaching applications - Teaching process - Teaching systems
DOI: 10.1145/3482632.3483081
Funding Details: Number: Z17002, Acronym: -, Sponsor: -; Number: 20200509, Acronym: -, Sponsor: -;
Funding text: This work was financially supported by Shaanxi Provincial Association for Science and Technology Young Talents Support Program Project, 20200509 and Major Innovation Project of the Ministry of Industry and Information Technology, Ministry of Industry and Information Technology (2016) No. 24, Z17002.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

428. Design and Implementation of Data Governance Platform for Oil Well Drilling Operation

Accession number: 20211910343062
Authors: Kong, Jie (1); Song, Caili (1)

Author affiliation: (1) Xi'an Shiyou University, School of Computer, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 231-234
Article number: 9408878
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: With the application of information technology in petroleum industry, petroleum companies have accumulated a lot of well drilling data. However, due to various reasons, these data may have many problems, such as data missing, data error. In this study, based on the actual drilling data of a petroleum company, a data governance platform for oil well drilling operation is designed and implemented. 3 main governance function: basic data governance, design data governance and well history data governance are realized to govern 17 data tables. The governance result indicates that the missing data and abnormal value are common in the existing drilling data. © 2021 IEEE.
Number of references: 8
Main heading: Infill drilling
Controlled terms: Gasoline - Oil well drilling - Oil wells
Uncontrolled terms: Abnormal values - Application of information technologies - Data governances - Design and implementations - Drilling data - Drilling operation - Missing data - Petroleum companies
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 523 Liquid Fuels
DOI: 10.1109/ICSP51882.2021.9408878
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

429. A Full Field-of-View Online Visual Ferrograph Debris Detector Based on Reflected Light Microscopic Imaging

Accession number: 20212010371912
Authors: Li, Bo (1); Wu, Wei (2); Zhou, Mi (2); Xi, Yinhu (3); Wei, Hangxin (2); Mao, Junhong (3)
Author affiliation: (1) Department of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Xi'an Shiyou University, Xi'an; 710065, China; (3) Department of Mechanical Engineering, Xi'an Jiaotong University, Xi'an; 710049, China
Corresponding author: Li, Bo(libo@xsyu.edu.cn)
Source title: IEEE Sensors Journal
Abbreviated source title: IEEE Sensors J.
Volume: 21
Issue: 15
Issue date: August 1, 2021
Publication year: 2021
Pages: 16584-16597
Article number: 9427529
Language: English
ISSN: 1530437X
E-ISSN: 15581748
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: For improving the detection accuracy of wear debris visual information for online wear monitoring, a full field-of-view Online Visual Ferrograph (OLVF) debris detector is presented. In current OLVF debris detector, a semi-transparent optical diffusion film is clamped into the gap between the bottom optical quartz window and two magnetic poles as the background of full field-of-view OLVF microscopic imaging, by which the emitted light of circular ring LED array is diffusely reflected. A reflected light microscopic imaging system is developed to form the full field-of-view imaging of OLVF, and a mathematical relationship between its depth of field and the oil-pumping and oil-free axial deviations of CMOS image plane is established, by which the oil chamber height can be determined. An optical focusing mechanism is applied to adjusting the optical magnification and the optical resolution of about 7.2μm is derived under 2.0× optical magnification. Moreover, a microscopic imaging model is proposed to evaluate the characteristics of full field-of-view OLVF microscopic imaging. The simulation results show that the high-quality microscopic imaging can be obtained near the optical axis of CMOS image plane under 2.0× optical magnification and oil attenuation coefficient of less than 2.0. Two experiments were conducted to validate the microscopic imaging performance and effectiveness of the current detector. The results show that the detector can be applied for capturing the full field-of-view reflected ferrogram of wear debris from different in-use lube oils, and it can also detect debris concentration more accurately for monitoring the fast-changing wear of the machines. © 2001-2012 IEEE.
Number of references: 32
Main heading: CMOS integrated circuits
Controlled terms: Wear of materials - Wear debris
Uncontrolled terms: Attenuation coefficient - Detection accuracy - Mathematical relationship - Microscopic imaging - Microscopic imaging model - Optical diffusion - Optical resolution - Visual information
Classification code: 452.3 Industrial Wastes - 714.2 Semiconductor Devices and Integrated Circuits - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1109/JSEN.2021.3079174
Funding Details: Number: 51805410, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2021JM-405, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: Manuscript received March 26, 2021; accepted May 7, 2021. Date of publication May 11, 2021; date of current version July 30, 2021. This work was supported in part by the National Natural Science Foundation of China under Grant 51805410 and in part by the Natural Science Basic Research Program of Shaanxi under Grant 2021JM-405. The associate editor coordinating the review of this article and approving it for publication was Dr. Qiang Wu. (Corresponding author: Bo Li.) Bo Li is with the Department of Mechanical Engineering, Xi'an Shiyou University, Xi'an 710065, China (e-mail: libo@xsyu.edu.cn).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

430. The Impact of Harmonic Generated by Distributed Photovoltaic Grid-connected Power Generation System

Accession number: 20214010976395
Authors: Wu, Xiaomeng (1); Li, Zexuan (1)
Author affiliation: (1) Xi'An Shiyou University, School of Electric Engineering, China
Source title: IMCEC 2021 - IEEE 4th Advanced Information Management, Communicates, Electronic and Automation Control Conference
Abbreviated source title: IMCEC - IEEE Adv. Inf. Manag., Commun., Electron. Autom. Control Conf.
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Issue title: IMCEC 2021 - IEEE 4th Advanced Information Management, Communicates, Electronic and Automation Control Conference
Issue date: June 18, 2021
Publication year: 2021
Pages: 43-46
Language: English
ISSN: 2693-2814
E-ISSN: 2693-2776
ISBN-13: 9781728185347
Document type: Conference article (CA)
Conference name: 4th IEEE Advanced Information Management, Communicates, Electronic and Automation Control Conference, IMCEC 2021
Conference date: June 18, 2021 - June 20, 2021
Conference location: Chongqing, China

Conference code: 170540
Sponsor: Chengdu Union Institute of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Global Union Academy of Science and Technology; IEEE Beijing Section
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Since the industrial revolution, the application of traditional petrochemical energy has brought a lot of pollution and greenhouse effect to the global environment, and new energy technology, as one of the important ways to solve global environmental problems, has been widely recognized by all countries in the world, and its application has become more and more deep widely. As a majority of distributed photovoltaic projects are integrated into the distribution network to generate electricity, the impact on the distribution network and system stability has become increasingly prominent. Since distributed photovoltaic grid connection is the main form and development trend of photovoltaic power generation in the future, analyzing the impact of its harmonics on the distribution network is particularly important for maintaining the stable operation of the grid system. © 2021 IEEE.
Number of references: 10
Main heading: Fast Fourier transforms
Controlled terms: Solar power generation - Solar energy - Environmental technology - Greenhouse effect - Harmonic analysis - Electric power transmission networks - System stability
Uncontrolled terms: Distributied network - Energy - Global environment - Global environmental problems - Grid-connected - Industrial revolutions - New energy technologies - Photovoltaic grids - Photovoltaics - Power generation systems
Classification code: 443.1 Atmospheric Properties - 451 Air Pollution - 454 Environmental Engineering - 615.2 Solar Power - 657.1 Solar Energy and Phenomena - 706.1.1 Electric Power Transmission - 921.3 Mathematical Transformations - 921.6 Numerical Methods - 961 Systems Science
DOI: 10.1109/IMCEC51613.2021.9482267
Funding Details: Number: 2021JM-404, Acronym: -, Sponsor: -; Number: YCS20141006, Acronym: -, Sponsor: -;
Funding text: ACKNOWLEDGMENTS This paper is supported by Shaanxi Province Science and Technology Plan Basic Research Project (2021JM-404) and Xi’an Shiyou University Graduate Innovation,Practice Ability Training Project YCS20141006).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

431. Research and Application of Garbage Foreign Object Recognition Algorithm

Accession number: 20220411514869
Authors: Wang, Xiao-Yan (1); Chen, Na-Na (1); Zhu, Bing-Hao (1)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Xi'an, China
Corresponding author: Wang, Xiao-Yan(shiyouwxy@126.com)
Source title: Proceedings of SPIE - The International Society for Optical Engineering
Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 12079
Part number: 1 of 1
Issue title: Second IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
Issue date: 2021
Publication year: 2021
Article number: 1207908
Language: English
ISSN: 0277786X
E-ISSN: 1996756X
CODEN: PSISDG
ISBN-13: 9781510650329
Document type: Conference article (CA)
Conference name: 2nd IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
Conference date: October 8, 2021 - October 10, 2021
Conference location: Xi'an, China
Conference code: 176101
Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University

Publisher: SPIE
Abstract: Aiming at the difficulties and pain points of garbage quality identification in the transfer process, technical demonstrations are mainly carried out from the aspects of image preprocessing, deep learning algorithm selection, and model training. A model of dry and wet garbage abnormalities in complex scenarios was established. The specific garbage image preprocessing method, deep learning algorithm and model training technology used in this project are determined. A set of intelligent identification system for automatically detecting the quality of garbage classification has been developed, and all the identification indicators of the system are better than expected. © 2021 SPIE
Number of references: 9
Main heading: Learning algorithms
Controlled terms: Image classification - Deep learning - Object recognition
Uncontrolled terms: Algorithm selection - Deep learning - Foreign object - Garbage classification - Image preprocessing - Model training - Object recognition algorithm - Quality identifications - Research and application - Transfer process
Classification code: 461.4 Ergonomics and Human Factors Engineering - 723.2 Data Processing and Image Processing - 723.4.2 Machine Learning
DOI: 10.1117/12.2622736
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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432. Research of Active Disturbance Rejection Controller Design for PMSM Servo System (*Open Access*)

Accession number: 20212110392501
Authors: Hongliang, Yan (1, 2); Jiapeng, Li (1, 2); Leiming, Li (1, 2); Juju, Ma (1, 2)
Author affiliation: (1) Shaanxi Key Laboratory of Oil and Gas Well Measurement and Control Technology, Xi'An Shiyou University, China; (2) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1894
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012039
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In the permanent magnet synchronous motor (PMSM) speed control system, an improved active disturbance rejection control strategy with higher tracking accuracy for time-varying input is proposed. The traditional active disturbance rejection controller is mainly used for fast and static-free tracking of step signals, but there is a large tracking error for time-varying signals, which limits the application of active disturbance rejection controller. In this paper, the theoretical analysis of the existence of steady-state error is carried out, and then an improved speed active disturbance rejection controller (ADRC) with derivative feedforward and parallel linear extended state observer(P-LESO) is designed to reduce the tracking error of the system. In order to observe and compensate the reverse electromotive force in real time and reduce the current following error, a current loop linear active disturbance rejection controller is designed. By constructing Simulink simulation model for verification, the control system not only improves the tracking accuracy of PMSM for time-varying input, but also has a good dynamic performance for step input. © Published under licence by IOP Publishing Ltd.
Number of references: 9

Main heading: Controllers
Controlled terms: Time varying control systems - Synchronous motors - Permanent magnets - Errors - Disturbance rejection
Uncontrolled terms: Active disturbance rejection controller - Active disturbance rejection controls - Dynamic performance - Extended state observer - Permanent Magnet Synchronous Motor - Simulink simulations - Steady state errors - Time varying signal
Classification code: 704.1 Electric Components - 705.3.1 AC Motors - 731 Automatic Control Principles and Applications - 731.1 Control Systems - 732.1 Control Equipment
DOI: 10.1088/1742-6596/1894/1/012039
Funding Details: Number: YCS19213100, Acronym: -, Sponsor: -; Number: 15JS084, Acronym: -, Sponsor: -;
Funding text: The project is funded by the Shaanxi Provincial Department of Education Key Laboratory Project (15JS084) and the Graduate Innovation and Practical Ability Training Program of Xi'an Shiyou University(YCS19213100).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

433. Research on model-based abnormal traffic detection method (*Open Access*)

Accession number: 20214111007851
Authors: Han, Jiaxin (1); Wang, Xiaowei (1)
Author affiliation: (1) School of Computer Science of Xi'an Shiyou University, China
Corresponding author: Wang, Xiaowei(859675296@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 2024
Part number: 1 of 1
Issue: 1
Issue title: 2nd International Conference on Computer Vision and Data Mining, ICVDM 2021
Issue date: September 27, 2021
Publication year: 2021
Article number: 012065
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2nd International Conference on Computer Vision and Data Mining, ICVDM 2021
Conference date: August 20, 2021 - August 22, 2021
Conference location: Changsha, Virtual, China
Conference code: 172126
Publisher: IOP Publishing Ltd
Abstract: Information security has become a concern of all walks of life, and anomaly detection can protect information security, so anomaly detection has become a research hotspot. In this paper, the principles of four commonly used model-based anomaly detection methods, namely, depth-based, distance-based, density-based and deep learning-based detection methods are introduced and their research status is reviewed. Analyzed the characteristics of the four methods, and finally pointed out the future development trend of anomaly detection methods and gave a conclusion. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 10
Main heading: Anomaly detection
Controlled terms: Security of data - Deep learning
Uncontrolled terms: Abnormal traffic detection - Anomaly detection - Anomaly detection methods - Density-based - Detection methods - Distance-based - Hotspots - Life detection - Model-based OPC - Protect information
Classification code: 461.4 Ergonomics and Human Factors Engineering - 723.2 Data Processing and Image Processing
DOI: 10.1088/1742-6596/2024/1/012065
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

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434. Research on Modeling and Transformation Method of Web Service Composition Based on Petri Net

Accession number: 20211910343314
Authors: Yang, Huaizhou (1); Shi, Wenbo (1)
Author affiliation: (1) Xi'an Shiyou University, College of Computer Science, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
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Issue date: April 9, 2021
Publication year: 2021
Pages: 1114-1117
Article number: 9408819
Language: English
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: BPEL (Business Process Execution Language) is a classical Web service composition process language. In this situation, it is also known as WS-BPEL or BPEL4WS. However, BPEL is lack of formal analysis and verification methods. In order to solve this problem, a serial of rules to convert the BPEL to Petri net model are presented in this study, which enable the more intuitive and rigorous mathematical description of service composition process, and also facilitate the analysis and verification to the composite services. © 2021 IEEE.
Number of references: 14
Main heading: Petri nets
Controlled terms: Quality of service - Web services - Websites
Uncontrolled terms: Analysis and verifications - Business Process Execution Language - Composite services - Mathematical descriptions - Petri net models - Service composition process - Transformation methods - Web service composition
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.1109/ICSP51882.2021.9408819
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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435. Application Research of Petroleum and Gas Reservoir Modeling Based on Machine Learning

Accession number: 20211910343027
Authors: Zheng, Kaidong (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
Corresponding author: Zheng, Kaidong(kdzheng@xsyu.edu.cn)
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Publication year: 2021
Pages: 941-944
Article number: 9408833
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)

Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This paper describes the data-driven machine learning modeling of the spatial distribution of geophysical parameters in petroleum and gas reservoirs. Multiple kernel learning methods are used to integrate geological information with multi-scale features, so that prior knowledge of the reservoir and seismic data can be efficiently combined. Geological features can be determined by capturing gradients and other data from seismic data using image processing related technologies. For some more geological features, one-to-one correspondence of multiple kernel functions can be used to calculate geophysical parameters in a high-dimensional space. The multiple kernel learning method is adopted according to the principle that the dependence relationship learned from the data is better than the predefined model, and the geophysical parameters of the reservoir can be flexibly controlled through the change of the model parameters. Finally, the predicted values are given as a set of weighted kernel functions, and a complex braided channel reservoir is reproduced using actual petroleum field data. © 2021 IEEE.
Number of references: 13
Main heading: Seismic waves
Controlled terms: Gasoline - Petroleum prospecting - Petroleum reservoirs - Machine learning - Data handling - Image processing - Seismic response - Learning systems - Petroleum reservoir engineering - Geophysical prospecting - Geology
Uncontrolled terms: Application research - Dependence relationships - Geological information - Geophysical parameters - High dimensional spaces - Machine learning models - Multi-scale features - Multiple Kernel Learning
Classification code: 481.1 Geology - 481.4 Geophysical Prospecting - 484 Seismology - 484.2 Secondary Earthquake Effects - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 523 Liquid Fuels - 723.2 Data Processing and Image Processing - 723.4 Artificial Intelligence
DOI: 10.1109/ICSP51882.2021.9408833
Compendex references: YES
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Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

436. Research on a high-precision and high-resolution seismic wave signal acquisition system (*Open Access*)

Accession number: 20212110398110
Authors: Dan, Wu (1); Hongtao, Wu (1); Guowang, Gao (1); Fei, Wang (1)
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Corresponding author: Dan, Wu
Source title: Journal of Physics: Conference Series
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Volume: 1894
Part number: 1 of 1
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Publication year: 2021
Article number: 012059
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In oil and gas exploration, high-resolution seismic acquisition is an important research content of seismic exploration methods. In order to improve the accuracy and high resolution of the seismic wave acquisition system,

a seismic wave signal acquisition system based on the 32-bit high-resolution analog-to-digital converter ADS1282 is designed in cooperation with a high-anti-interference and high-resolution piezoelectric geophone, Improve the resolution of seismic wave signal acquisition from the two aspects of seismic wave pickup and analog-to-digital conversion. The system chooses the high-performance, ultra-low power consumption Microcontroller MSP430F149 as the control core of the acquisition system, which effectively reduces system power consumption. System debugging results show that the collected data of ADS1282 is stable to 24 bits, and the consistency is good. © Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Seismic waves
Controlled terms: Digital to analog conversion - Electric power utilization - Program debugging - Analog to digital conversion - Signal processing - Petroleum prospecting - Seismology
Uncontrolled terms: Acquisition systems - Analog to digital converters - Anti-interference - High resolution - High resolution seismic - Oil and gas exploration - Seismic exploration - Ultra-low power consumption
Classification code: 484 Seismology - 484.1 Earthquake Measurements and Analysis - 512.1.2 Petroleum Deposits : Development Operations - 706.1 Electric Power Systems - 716.1 Information Theory and Signal Processing - 723.1 Computer Programming - 723.2 Data Processing and Image Processing
DOI: 10.1088/1742-6596/1894/1/012059
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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437. Rollover of Liquid Natural Gas in a Storage Tank: A Numerical Simulation (*Open Access*)

Accession number: 20220111421684
Authors: Lu, Yinbin (1); Liang, Chenwei (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'An Shiyou University, Xi'an, China
Corresponding author: Lu, Yinbin(yblu@xsyu.edu.cn)
Source title: Advances in Transdisciplinary Engineering
Abbreviated source title: Adv. Transdiscipl. Eng.
Volume: 17
Part number: 1 of 1
Issue title: Moving Integrated Product Development to Service Clouds in the Global Economy - Proceedings of the 21st ISPE Inc. International Conference on Concurrent Engineering, CE 2014
Issue date: December 3, 2021
Publication year: 2021
Pages: 93-99
Language: English
ISBN-13: 9781643682228
Document type: Conference article (CA)
Conference name: 2nd International Conference on Green Energy, Environment and Sustainable Development, GEESD 2021
Conference date: June 26, 2021
Conference location: Virtual, Online, China
Conference code: 175575
Publisher: IOS Press BV
Abstract: In the filling and transportation processes of liquefied natural gas (LNG), the safety of LNG storage tanks is compromised because of rollover phenomenon. As such, the rollover factors of LNG in a storage tank should be identified to prevent or weaken the rollover intensity of LNG. In this study, the rollover behavior of LNG in a storage tank is numerically simulated. The density of the two layers in a LNG storage tank is related to temperature in our numerical model. It is found that the greater the significant initial density difference (range of 1-12 kg·m-3) is, the more obvious the LNG rollover will be. A density difference of 7.5 kg·m-3 is found as the critical density difference in the present work. When the initial density difference exceeds the critical density difference, the LNG rollover coefficients increase dramatically. Moreover, an LNG rollover model with two daughter models is proposed, which are divided by the critical initial density difference, i.e., a cubic relationship between rollover coefficients and the initial density difference when the density difference is less than 7.5 kg·m-3 and secondly, a linear relationship between the rollover coefficient and the double exponential functions when the density difference is larger than 7.5 kg·m-3. © 2021 The authors and IOS Press.
Number of references: 17
Main heading: Liquefied natural gas

Controlled terms: Natural gas transportation - Tanks (containers) - Numerical models - Exponential functions
Uncontrolled terms: Critical density - Critical density difference - Density - Density difference - Gas storage tank - Initial density - Liquid natural gas - Natural gas storage - Rollover - Storage tank
Classification code: 522 Gas Fuels - 523 Liquid Fuels - 619.2 Tanks - 921 Mathematics
Numerical data indexing: Mass density 1.00E00kg/m3 to 1.20E+01kg/m3, Mass density 7.50E+00kg/m3
DOI: 10.3233/ATDE210264
Funding Details: Number: 2020JQ-772, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: The work is supported by Natural Science Foundation of Shaanxi Province of China (No. 2020JQ-772).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

438. Chinese Traffic Sign Text Detection Method Based on Improved EAST

Accession number: 20220711615861
Authors: Yao, Peng (1); Cuan, Ying (1)
Author affiliation: (1) Xi'An Shiyou University, Department of Computer Science, Xi'an, China
Source title: Proceedings - 2021 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Abbreviated source title: Proc. - Int. Symp. Comput. Inf. Process. Technol., ISCIPT
Part number: 1 of 1
Issue title: Proceedings - 2021 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Issue date: 2021
Publication year: 2021
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Language: English
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Document type: Conference article (CA)
Conference name: 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Conference date: June 11, 2021 - June 13, 2021
Conference location: Virtual, Changsha, China
Conference code: 175833
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: As an important content in the research of unmanned driving and traffic systems, traffic sign recognition has great theoretical value and application prospects. Especially text-based traffic signs, which contain rich high-level semantic information, can provide extremely rich road information. In order to realize the automatic detection of Chinese traffic sign text, an improved EAST text detection method is proposed. This method introduces BLSTM between the output layer and the feature merging layer to enhance the context relationship of the feature vector and improve the receptive field of the network. At the same time, in order to improve the detection accuracy of the algorithm for night images, an automatic image enhancement module is added at the head end of the network. It can detect the light of the input image and automatically improve the contrast of the image that is judged to be poorly lit. Effectively improve the image detection effect of the model in low-light environments. The experimental results show that the improved method achieves satisfactory results on the CTST-1600 data set. © 2021 IEEE.
Number of references: 7
Main heading: Traffic signs
Controlled terms: Image enhancement - Semantics
Uncontrolled terms: Application prospect - BLSTM - Detection methods - EAST - High level semantics - Text detection - Theoretical values - Traffic sign recognition - Traffic systems - Unmanned driving system
Classification code: 432.4 Highway Traffic Control
DOI: 10.1109/ISCIPT53667.2021.00150
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

439. Research and analysis of image enhancement algorithm in the classification of rock thin section images

Accession number: 20213510848032
Authors: Huaizhou, Yang (1); Danyang, Xu (1)
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Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Issue date: July 23, 2021
Publication year: 2021
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Article number: 9513355
Language: English
ISBN-13: 9781665437158
Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The structure of rock flakes is complex and difficult to be classified accurately. The proposed method to solve the problem is to use an image enhancement algorithm to enhance the rock slice image. In the study, the neural network ResNet50, which has a significant effect on fine-grained classification, was used to construct the rock cast thin section image classifier, and three image enhancement algorithms, CutOut, MixUp, and CutMix, were used to enhance the rock thin section image. The rock slice images used in the data set are from Ordos, and are divided into five categories according to the size of the rock. The experimental result obtained was that the CutOut algorithm performs well on the data set, and the accuracy of the classifier was as high as 93.39%, which is 1.3% higher than the result of only using ResNet50 for classification. The experimental results show the effectiveness of the image enhancement algorithm in the classification of rock slice images. © 2021 IEEE.
Number of references: 10
Main heading: Image classification
Controlled terms: Rocks - Classification (of information) - Image enhancement
Uncontrolled terms: Data set - Fine grained - Image enhancement algorithm - Research and analysis - Slice image - Thin section
Classification code: 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis
Numerical data indexing: Percentage 1.30e+00%, Percentage 9.34e+01%
DOI: 10.1109/ICMSP53480.2021.9513355
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

440. Multi-malicious nodes double-spending attack blacklist management model

Accession number: 20214110999685
Authors: Liu, Qiang (1); Yan, Song (2); Wan, Jie (3); Ma, Ruiqiang (1); Xu, Jianhang (1)
Author affiliation: (1) Liaoning University, China; (2) Xi'An Shiyou University, China; (3) Harbin Engineering University, China
Source title: ACM International Conference Proceeding Series
Abbreviated source title: ACM Int. Conf. Proc. Ser.
Part number: 1 of 1
Issue title: 2021 4th International Conference on Data Science and Information Technology, DSIT 2021
Issue date: July 23, 2021
Publication year: 2021
Pages: 462-467
Language: English

ISBN-13: 9781450390248
Document type: Conference article (CA)
Conference name: 4th International Conference on Data Science and Information Technology, DSIT 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Shanghai, China
Conference code: 172077
Publisher: Association for Computing Machinery
Abstract: The double-spending attack on the blockchain has been extensively studied, and many research results have been obtained. However, most of these researches are the improvement and prevention for current attack algorithms, and the double-spending attack among multiple malicious nodes is also a valuable research direction. This article further analyzes on the basis of current researches, and proposes a multi-malicious node double-spending attack blacklist management model based on the malicious behavior from different malicious nodes. Firstly, studying the double-spending attacks model to get the mathematical rules between multiple malicious nodes then, electing credible nodes to build a blacklist management model. Finally, malicious nodes are extracted through the blacklist single-judgment and double-judgment strategies, which fundamentally block the nodes from further doing evil. Simulation experiments show that the blacklist management model can effectively resist double-spending attacks from multi-malicious nodes. © 2021 ACM.
Number of references: 13
Uncontrolled terms: 'current - Blacklist double judgment - Blacklist management model - Blacklist single judgment - Block-chain - Malicious nodes - Management Model - Model-based OPC - Multiple malicious node double-spending attack - Research results
DOI: 10.1145/3478905.3479005
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

441. Research on fine-tuning strategy of sentiment analysis model based on BERT

Accession number: 20213110705868
Authors: Li, Xiaojia (1); Wang, Xiaoxiao (1); Liu, Hao (1)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an, China
Source title: 2021 IEEE 3rd International Conference on Communications, Information System and Computer Engineering, CISCE 2021
Abbreviated source title: IEEE Int. Conf. Commun., Inf. Syst. Comput. Eng., CISCE
Part number: 1 of 1
Issue title: 2021 IEEE 3rd International Conference on Communications, Information System and Computer Engineering, CISCE 2021
Issue date: May 14, 2021
Publication year: 2021
Pages: 798-802
Article number: 9445882
Language: English
ISBN-13: 9780738112152
Document type: Conference article (CA)
Conference name: 3rd IEEE International Conference on Communications, Information System and Computer Engineering, CISCE 2021
Conference date: May 14, 2021 - May 16, 2021
Conference location: Beijing, China
Conference code: 170477
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: BERT, as a pre-trained model, can not only greatly improve the performance of the task models in the field of language processing, but also greatly save computational resources and costs. At present, most of sentiment classification tasks focus on the model structures. But it is very important to explore the changes of hyper-parameters based on the task models so as to obtain a general parameters setting method for improving the accuracy of models' predictions. In this paper, we conduct two parameter fine-tuning methods: static parameter fine-tune is used to improve the performance of the task models, and then use the layer frozen strategy to further fine-tune the task models. We propose that when the static learning rate is 2e-5 and the batch size is 32, the prediction performance of the sentiment analysis model is improved. Then, under such parameter settings, we further fine-tune the sentiment analysis model by

adopting the dynamic layer frozen strategy. After fine-tuning, the prediction accuracy is more accurate than that under the static optimal parameters. © 2021 IEEE.
Number of references: 21
Main heading: Sentiment analysis
Controlled terms: Model structures - Forecasting
Uncontrolled terms: Computational resources - Fine-tuning methods - Language processing - Parameter setting - Parameters setting - Prediction accuracy - Prediction performance - Sentiment classification
Classification code: 723.2 Data Processing and Image Processing
DOI: 10.1109/CISCE52179.2021.9445882
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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442. Technical challenges in online teaching in chinese universities under epidemic situation

Accession number: 20213510822799
Authors: Qiang, Xinjian (1)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University, Xi'an, China
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Source title: ACM International Conference Proceeding Series
Abbreviated source title: ACM Int. Conf. Proc. Ser.
Part number: 1 of 1
Issue title: Proceedings of the 6th International Conference on Information Management and Technology, CIMTECH 2021
Issue date: August 19, 2021
Publication year: 2021
Article number: 3465855
Language: English
ISBN-13: 9781450385015
Document type: Conference article (CA)
Conference name: 6th International Conference on Information Management and Technology, CIMTECH 2021
Conference date: August 19, 2021 - August 20, 2021
Conference location: Jakarta, Indonesia
Conference code: 171281
Publisher: Association for Computing Machinery
Abstract: Online teaching has become the main teaching method during the epidemic period. Online teaching mode has broken through the current mode of higher education, through the application of educational technology; the teaching form has been expanded in time and space. This paper analyzes the challenges of online teaching in Chinese Universities during the epidemic period, discusses the coping strategies of online teaching in Colleges and universities after the epidemic, and puts forward the construction of a new ecology of online teaching to effectively promote the scientific development of online teaching in Colleges and universities. © 2021 ACM.
Number of references: 6
Main heading: E-learning
Controlled terms: Epidemiology
Uncontrolled terms: Chinese universities - Colleges and universities - Coping strategies - Higher education - Online teaching modes - Scientific development - Teaching methods - Technical challenges
Classification code: 461.7 Health Care
DOI: 10.1145/3465631.3465855
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

443. Research on fuzzy control of centrifugal compressor anti-surge in long-distance natural gas pipeline

Accession number: 20213510848006
Authors: Li, Lin (1); Bai, Yicheng (1)

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Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Issue date: July 23, 2021
Publication year: 2021
Pages: 13-17
Article number: 9513328
Language: English
ISBN-13: 9781665437158
Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Now, the demand for natural gas in all walks of life is increasing. Our country has built a large number of natural gas pipelines. The centrifugal compressor is of great significance to the smooth operation of the natural gas pipeline network. Surge is a dangerous working condition that may occur when the compressor is running, although traditional anti-surge solutions guaranteed basic operational safety, the control effect still has a large amount of rooms for improvement. This paper designs an anti-surge controller based on fuzzy theory and validates it by simulation. © 2021 IEEE.
Number of references: 10
Main heading: Centrifugal compressors
Controlled terms: Gas compressors - Natural gas pipelines - Centrifugation - Fuzzy control - Natural gas
Uncontrolled terms: Anti surges - Fuzzy theory - Large amounts - Operational safety
Classification code: 522 Gas Fuels - 618.1 Compressors - 619.1 Pipe, Piping and Pipelines - 731 Automatic Control Principles and Applications - 802.3 Chemical Operations
DOI: 10.1109/ICMSP53480.2021.9513328
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

444. FPGA spread spectrum communication method based on M sequence

Accession number: 20213510848110
Authors: Xu, Jingtian (1); Zhang, Zhixuan (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Corresponding author: Zhang, Zhixuan(1411252622@qq.com)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Issue date: July 23, 2021
Publication year: 2021
Pages: 103-107
Article number: 9513383
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ISBN-13: 9781665437158
Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021

Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: As an important digital communication technology, spread spectrum communication has the characteristics of strong anti-interference and high spectrum utilization, and has been widely used in real life. At the same time, because FPGA has the advantages of data parallel processing capability and high flexibility, it is very suitable for researching and designing spread spectrum communication systems. Therefore, this paper designs a direct sequence spread spectrum communication method based on FPGA. By building the direct sequence spread spectrum communication system architecture and using modular design method, the behavior-level design of the direct sequence spread spectrum communication system has been realized, and it has passed the synthesis and simulation. It is verified that the system has strong anti-noise and anti-interference ability, and reflects the speed advantage of FPGA hardware in processing data. © 2021 IEEE.
Number of references: 12
Main heading: Field programmable gate arrays (FPGA)
Controlled terms: Data handling - Parallel processing systems - Spread spectrum communication - Integrated circuit design - Digital communication systems - Spectroscopy - Binary sequences
Uncontrolled terms: Anti-interference - Digital communications - Direct sequence spread spectrum - Direct sequence spread spectrum communication system - FPGA hardwares - High flexibility - Modular-design method - Spectrum utilization
Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 716.3 Radio Systems and Equipment - 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 721.2 Logic Elements - 722.4 Digital Computers and Systems - 723.2 Data Processing and Image Processing
DOI: 10.1109/ICMSP53480.2021.9513383
Funding Details:
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Database: Compendex
Data Provider: Engineering Village
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445. A propelled multiple fusion Deep Belief Network for weld defects detection

Accession number: 20214411107592
Authors: Liu, Mengxi (1); Li, Yingliang (1); Wang, Zheng (1)
Author affiliation: (1) Xi'an Shiyou University, School of Electronic and Engineering, China
Source title: ACM International Conference Proceeding Series
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Part number: 1 of 1
Issue title: CCRIS 2021 - Proceedings of 2021 2nd International Conference on Control, Robotics and Intelligent System
Issue date: August 20, 2021
Publication year: 2021
Pages: 141-146
Article number: 3483896
Language: English
ISBN-13: 9781450390453
Document type: Conference article (CA)
Conference name: 2nd International Conference on Control, Robotics and Intelligent System, CCRIS 2021
Conference date: August 20, 2021 - August 22, 2021
Conference location: Qingdao, China
Conference code: 172904
Publisher: Association for Computing Machinery
Abstract: With the characteristics including fuzzy edges, high image noise, low pixels and contrast, X-ray images of weld defect are difficult to be effectively recognized. Various well-known deep network is used for improving image recognition performance, so that researchers pay more attention on weld defects detection by using deep network with stack structure. However, such stack structure shows some disadvantages, such as inaccuracy recognition on confusion feature, low uncertainty-handling efficiency, time-consuming and complex computation. In this paper, a propelled multiple fusion Deep Belief Network (PMF-DBN) structure with Fuzzy Classifiers (FC) is created for weld

defect classification and recognition. The proposed PMF-DBN enjoy both the ability of DBN neural representation and the of capability of fuzzy representation in order to meet the requirements of variant image feature processing. Meanwhile, instead of time-consuming fine-tuning training, the outputs feature data of each layer is fused in a propelled way, by which effective feature extraction can be achieved. Experiments on weld defects multi-classification demonstrate effectiveness of the PMF-DBN. Compared with the DBN, PMF-DBN has higher recognition accuracy and better fitting performance. © 2021 ACM.
Number of references: 13
Main heading: Fuzzy sets
Controlled terms: Defects - Image recognition - Image enhancement - Welds
Uncontrolled terms: Deep belief networks - Fuzzy classifiers - Image noise - Performance - Propelled multiple fusion - Stack structure - Weld defects - Weld defects detections - Weld defects recognition - X-ray image
Classification code: 538.2 Welding - 951 Materials Science
DOI: 10.1145/3483845.3483896
Funding Details: Number: ProgramNo.2020JM-542, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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Database: Compendex
Data Provider: Engineering Village
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446. Application of Improved RBF Neural Network in Behavior Analysis of College Student

Accession number: 20220711615931
Authors: Cuan, Ying (1); Tan, Siyu (1)
Author affiliation: (1) Xi'An Shiyou University, School of Computer Science, Xi'an, China
Source title: Proceedings - 2021 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Abbreviated source title: Proc. - Int. Symp. Comput. Inf. Process. Technol., ISCIPT
Part number: 1 of 1
Issue title: Proceedings - 2021 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Issue date: 2021
Publication year: 2021
Pages: 555-558
Language: English
ISBN-13: 9781665441377
Document type: Conference article (CA)
Conference name: 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Conference date: June 11, 2021 - June 13, 2021
Conference location: Virtual, Changsha, China
Conference code: 175833
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: With the development of the times, how to dig out valuable information from massive data has become the focus of attention in various industries. The RBF neural network algorithm is widely used in the field of data mining. The performance of the traditional RBF neural network mainly depends on the center position of the hidden layer, which is usually obtained using the k-means algorithm. However, the initial clustering center of the k-means algorithm is random, so the selection of the initial clustering center will have a certain impact on the clustering result. Moreover, this method usually stops at a local optimal solution. Therefore, this paper proposes a bottom-up hierarchical clustering algorithm (BHC) to optimize the RBF neural network, using the BHC algorithm to adaptively obtain the center position of the hidden layer node of the RBF neural network, which eliminates the traditional RBF neural network's initial the sensitivity of the clustering center improves the prediction accuracy of the neural network. © 2021 IEEE.
Number of references: 7
Main heading: Data mining
Controlled terms: Multilayer neural networks - Radial basis function networks - K-means clustering - Students
Uncontrolled terms: Behavior analysis - Bottom up - College students - Focus of Attention - Hierarchical clustering algorithms - Initial clustering centers - K-mean algorithms - Massive data - Neural networks algorithms - RBF Neural Network
Classification code: 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis
DOI: 10.1109/ISCIPT53667.2021.00118
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village
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447. News text classification based on hybrid model of bidirectional encoder representation from transformers and convolutional neural network (*Open Access*)

Accession number: 20213810907798
Authors: Wei, Fan (1); Li, Fan (2)
Author affiliation: (1) Department of Computer Science, Xi'an Shiyou University, Xi'an, China; (2) Department of Computer Science, Xi'an Shiyou University, Xi'an, China
Corresponding author: Li, Fan(19212060600@stumail.xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 2005
Part number: 1 of 1
Issue: 1
Issue title: 2021 International Conference on Information Technology and Intelligent Control, CITIC 2021
Issue date: August 24, 2021
Publication year: 2021
Article number: 012021
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2021 International Conference on Information Technology and Intelligent Control, CITIC 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Guilin, Virtual, China
Conference code: 171600
Publisher: IOP Publishing Ltd
Abstract: At present, with the rapid development of Internet technology, text data show massive characteristics. Network media and new media platforms have become an important part of journalism and communication, and network news has become one of the important sources of information. In order to meet the needs of online news reading users and improve the efficiency of personalized news recommendation by content distribution platform, it is urgent to effectively manage and utilize online news. Based on this, this paper studies and implements the algorithm for news text classification, and the goal is to build a classification model for news text with higher classification accuracy. In this paper, BERT and CNN algorithm are combined to classify news texts. The core idea is to send BERT as the embedding layer into the CNN model. The experimental results show that this method is better than the simple BERT model or the simple CNN model. © 2021 Institute of Physics Publishing. All rights reserved.
Number of references: 6
Main heading: Convolutional neural networks
Controlled terms: Classification (of information) - Text processing - Network coding
Uncontrolled terms: Classification accuracy - Classification models - Content distribution - Internet technology - Network media - Personalized news - Sources of informations - Text classification
Classification code: 716.1 Information Theory and Signal Processing - 903.1 Information Sources and Analysis - 903.3 Information Retrieval and Use
DOI: 10.1088/1742-6596/2005/1/012021
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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448. Design and Implementation of Virtual Simulation System Software for Drilling Engineering

Accession number: 20211910343297
Authors: Huo, Aiqing (1); Xu, Jingrong (1); Li, Haoping (1); Zhang, Shuhan (1)
Author affiliation: (1) Xi'an Shiyou University, School of Electronic Engineering, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021

Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 1397-1400
Article number: 9408800
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at some problems existing in the traditional well control safety operation training, a drilling engineering virtual simulation system software is designed and developed. In this paper, the process of modular design of the drilling engineering virtual simulation system is given, and the overall layout of the software system interaction interface is completed, which mainly includes the user login interface, loading interface, main menu interface and the interface of the simulation interactive system. Virtual simulation interactive functions such as 'roaming system', 'lifting system', 'rotating system' and 'circulation system' are realized. The developed oil drilling virtual simulation system software has strong interactivity and realistic immersion, which can meet the training needs of oilfield drilling engineering. © 2021 IEEE.
Number of references: 13
Main heading: Infill drilling
Controlled terms: Computer software - Software design
Uncontrolled terms: Circulation systems - Design and implementations - Drilling engineering - Interactive functions - Interactive system - Safety operations - Virtual simulation system - Virtual simulations
Classification code: 511.1 Oil Field Production Operations - 723 Computer Software, Data Handling and Applications - 723.1 Computer Programming - 723.5 Computer Applications
DOI: 10.1109/ICSP51882.2021.9408800
Funding Details: Number: 17JS108, Acronym: -, Sponsor: -; Number: 2020GY-152, Acronym: -, Sponsor: -;
Funding text: Ac k n o w l ed g men t This research was partially supported by General Project of Shaanxi Provincial Science and Technology DepartmentIndustrial Field (No. 2020GY-152), and the scientific research project of the Key Laboratory of Education Department of Shaanxi Province (17JS108).This research was also funded by Xi'an Shiyou University Graduate Student Innovation and Practice Ability Training Program.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

449. K-means clustering analysis of Chinese traditional folk music based on midi music textualization

Accession number: 20211910343163
Authors: Liumei, Zhang (1); Fanzhi, Jiang (1); Jiao, Li (1); Gang, Ma (1); Tianshi, Liu (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 1062-1066
Article number: 9408762
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021

Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The current mainstream feature extraction of music information retrieval (MIR) is based on acoustics, such as frequency, loudness, zero-crossing rate. while it is rare to perform feature extraction and music analysis directly on symbolic music. This article seeks to introduce the idea of text clustering in natural language processing into the field of symbolic music style analysis. From this, this work got inspiration to turn midi music into text data and transform it into weighted structured data through tf-idf, and then use the K-Means clustering algorithm to perform cluster analysis and comparison on the traditional Chinese folk music dataset we crawled, and finally use The T-SNE algorithm performs dimensionality reduction and visualization of high-dimensional data. After a series of objective indicators evaluation, it is proved that the clustering algorithm has achieved a good clustering effect on the midi note dataset we extracted; through the clustering results, comprehensive professional music theory knowledge and the historical development characteristics of traditional Chinese folk music, Reverse verification of the 1300 midi music data sets has distinct modal characteristics of traditional Chinese folk music. © 2021 IEEE.
Number of references: 23
Main heading: Feature extraction
Controlled terms: Music - Information retrieval - Natural language processing systems - Cluster analysis - Data visualization - Extraction - K-means clustering
Uncontrolled terms: Clustering results - High dimensional data - Historical development - K-means clustering analysis - Modal characteristics - Music information retrieval - NAtural language processing - Zero crossing rate
Classification code: 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 802.3 Chemical Operations - 903.1 Information Sources and Analysis - 903.3 Information Retrieval and Use - 971 Social Sciences
DOI: 10.1109/ICSP51882.2021.9408762
Funding Details: Number: YCS20213205, Acronym: -, Sponsor: -; Number: 211817019,61802301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-056, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: We would like to thank Ms. Luo Luo from the Music Department of X i'an Shiyou University for helpful discussions and advice. This work is supported in part by the scholarship from National Natural Science Foundation of China (No. 61802301) and (No. 211817019), Shaanxi Natural Science Foundation of China (No. 2019JQ-056), and X i'an Shiyou University Graduate Innovation and Practical Ability Training Project (No. YCS20213205).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

450. AC corrosion interference of buried long distance pipeline

Accession number: 20213510848104
Authors: Li, Lin (1); Gao, Xinyao (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Corresponding author: Gao, Xinyao(349820637@qq.com)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Abbreviated source title: Int. Conf. Intell. Control, Meas. Signal Process. Intell. Oil Field, ICMSP
Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Issue date: July 23, 2021
Publication year: 2021
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Language: English
ISBN-13: 9781665437158
Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE

Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The interference law and calculation model of AC transmission lines and other AC facilities on buried long distance pipeline are briefly described. The main influence law of AC current on the passivation behavior of pipeline steel materials is summarized. The research progress on the mechanism and evaluation criteria of AC corrosion of pipeline under cathodic protection is systematically described. The main viewpoints and influencing factors of the mechanism model of ac interference corrosion are summarized, and the main problems of ac interference technology are summarized © 2021 IEEE.
Number of references: 13
Main heading: Cathodic protection
Controlled terms: Pipeline corrosion - Underground corrosion - Pipelines
Uncontrolled terms: Ac corrosions - AC interference - AC transmission lines - Calculation models - Evaluation criteria - Long distance pipelines - Mechanism model - Pipeline steel
Classification code: 539.1 Metals Corrosion - 539.2 Corrosion Protection - 619.1 Pipe, Piping and Pipelines
DOI: 10.1109/ICMSP53480.2021.9513377
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
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Compendex references: YES
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Data Provider: Engineering Village
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451. Edge detection and location of seismic image based on PCNN (*Open Access*)

Accession number: 20212110398147
Authors: Lou, Li (1); Chang, Xiangwei (1)
Author affiliation: (1) School of Computing, Xi'An Shiyou University, Xi'an, Shaanxi, China
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1894
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012096
Language: English
ISSN: 17426588
E-ISSN: 17426596
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: The discontinuous features in seismic data usually correspond to different geological edge information. Effective processing of these seismic data can help us make correct geological interpretations. In this paper, we apply coherent slices to detect and locate the boundary of fault polygons and propose a method for boundary detection and localization of seismic images based on PCNN. In image edge detection, the basic PCNN needs to adjust many parameters. This paper aims at this problem to improve the basic PCNN model, we simplify the feedback input and pulse input, only retain the external input stimulation and the connection domain external neuron stimulation, reduce the parameters, and simplify the calculation. Optimize parameters such as internal activity link coefficients, dynamic thresholds, and cycle times to improve interpretation efficiency and accuracy. Experiments show that the method used in this paper has good practicability and can effectively realize the fault polygons detection and positioning of coherent slices. © Published under licence by IOP Publishing Ltd.
Number of references: 7
Main heading: Edge detection

Controlled terms: Seismic waves - Seismic response - Faulting - Fault detection
Uncontrolled terms: Boundary detection - Discontinuous features - Dynamic threshold - Edge information - External input - Geological interpretation - Image edge detection - Internal activity
Classification code: 484 Seismology - 484.1 Earthquake Measurements and Analysis - 484.2 Secondary Earthquake Effects
DOI: 10.1088/1742-6596/1894/1/012096
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

452. Research on grid-connected in distributed photovoltaic power generation system

Accession number: 20211710252842
Authors: Wu, Xiaomeng (1); Yang, Yubing (1); Xu, Yonghui (1); Guo, Feiyan (1); Lei, Xiaogang (1); Zhao, Jiankun (1)
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Source title: IEEE Advanced Information Technology, Electronic and Automation Control Conference (IAEAC)
Abbreviated source title: Adv. Inf. Tech. Electron. and Autom. Control Conf.
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Issue date: 2021
Publication year: 2021
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Article number: 9390667
Language: English
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Document type: Conference article (CA)
Conference name: 5th IEEE Advanced Information Technology, Electronic and Automation Control Conference, IAEAC 2021
Conference date: March 12, 2021 - March 14, 2021
Conference location: Chongqing, China
Conference code: 168296
Sponsor: Chengdu Union Institute of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Global Union Academy of Science and Technology; IEEE Beijing Section
Abstract: Photovoltaic power generation, as a clean and renewable energy source, has broad development prospects. With the extensive development of distributed power generation technology, photovoltaic power generation has been widely used. Status of grid-connected distributed photovoltaic system is researched in this paper, and the impact of distributed photovoltaic power generation on the power distribution network is analyzed in terms of power flow, node voltage and network loss. © 2021 IEEE.
Number of references: 8
Main heading: Solar energy
Controlled terms: Electric load flow - Electric power transmission networks - Distributed power generation
Uncontrolled terms: Development prospects - Distributed power - Grid-connected - Photovoltaic power generation - Photovoltaic power generation systems - Photovoltaic systems - Power distribution network - Renewable energy source
Classification code: 657.1 Solar Energy and Phenomena - 706.1 Electric Power Systems - 706.1.1 Electric Power Transmission - 706.1.2 Electric Power Distribution
DOI: 10.1109/IAEAC50856.2021.9390667
Funding Details: Number: 18JS094, Acronym: -, Sponsor: -; Number: S202010705046, Acronym: -, Sponsor: National College Students Innovation and Entrepreneurship Training Program; Number: 2020JM-542, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: ACKNOWLEDGMENT This paper is supported by the Key Project of Shaanxi Provincial Education Department (18JS094), Natural Science Basic Research Program of Shaanxi (Program No. 2020JM-542), National College Student Innovation and Entrepreneurship Training Program (S202010705046).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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453. Rapid development of multi-source heterogeneous drilling data service system

Accession number: 20214411104688
Authors: Cheng, Zhong (1); Xu, Rongqiang (1); Chen, Jianbing (1); Li, Ning (1); Yu, Xiaolong (1); Ding, Xiangxiang (1); Cao, Jie (2)
Author affiliation: (1) CNOOC Ener Tech-Drilling &Production Co.; (2) Xi'an Shiyou University
Source title: Proceedings of the SPE/IADC Middle East Drilling Technology Conference and Exhibition
Abbreviated source title: Proc. SPE IADC Middle East Drill. Technol. Conf. Exhib.
Volume: 2021-May
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Issue title: SPE/IADC Middle East Drilling Technology Conference and Exhibition 2021, MEDT 2021
Issue date: 2021
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Article number: SPE-202199-MS
Language: English
ISBN-13: 9781613997260
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Conference name: SPE/IADC Middle East Drilling Technology Conference and Exhibition 2021, MEDT 2021
Conference date: May 25, 2021 - May 27, 2021
Conference location: Abu Dhabi, United arab emirates
Conference code: 169612
Publisher: Society of Petroleum Engineers (SPE)
Abstract: Digital oil and gas field is an overly complex integrated information system, and with the continuous expansion of business scale and needs, oil companies will constantly raise more new and higher requirements for digital transformation. In the previous system construction, we adopted multi-phase, multivendor, multi-technology and multi-method, resulting in the problem of data silos and fragmentation. The result of the data management problems is that decisions are often made using incomplete information. Even when the desired data is accessible, requirements for gathering and formatting it may limit the amount of analysis performed before a timely decision must be made. Therefore, through the use of advanced computer technologies such as big data, cloud computing and IOT (internet of things), it has become our current goal to build an integrated data integration platform and provide unified data services to improve the company's bottom line. As part of the digital oilfield, offshore drilling operations is one of the potential areas where data processing and advanced analytics technology can be used to increase revenue, lower costs, and reduce risks. Building a data mining and analytics engine that uses multiple drilling data is a difficult challenge. The workflow of data processing and the timeliness of the analysis are major considerations for developing a data service solution. Most of the current analytical engines require more than one tool to have a complete system. Therefore, adopting an integrated system that combines all required tools will significantly help an organization to address the above challenges in a timely manner. This paper serves to provide a technical overview of the offshore drilling data service system currently developed and deployed. The data service system consists of four subsystems. They are the static data management system including structured data (job report) and unstructured data (design documentation and research report), the real-time data management system, the third-party software data management system integrating major industry software databases, and the cloud-based data visual application system providing dynamic analysis results to achieve timely optimization of the operations. Through a unified logical data model, it can realize the quick access to the third-party software data and application support; These subsystems are fully integrated and interact with each other to function as microservices, providing a one-stop solution for real-time drilling optimization and monitoring. This data service system has become a powerful decision support tool for the drilling operations team. The learned lessons and gained experiences from the system services presented here provide valuable guidance for future demands E&P and the industrial revolution. © MEDT 2021.All right reserved.
Number of references: 6
Main heading: Data Analytics
Controlled terms: Cloud analytics - Information management - Offshore oil well production - Offshore technology - Oil field development - Application programs - Drilling platforms - Offshore drilling - Digital storage - Data integration - Data mining - Internet of things - Offshore oil fields - Gas industry - Information use - Offshore oil wells - Decision support systems - Infill drilling
Uncontrolled terms: 'current - Data management system - Data services - Digital oil field - Drilling data - Multi-Sources - Oil and gas fields - Service systems - Software data - Third party software
Classification code: 511.1 Oil Field Production Operations - 511.2 Oil Field Equipment - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 522 Gas Fuels - 674.2 Marine Drilling Rigs and Platforms - 675 Marine Engineering - 722.1 Data Storage, Equipment and Techniques - 722.3 Data Communication, Equipment and Techniques - 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 723.4 Artificial Intelligence - 903.3 Information Retrieval and Use - 912.2 Management

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Funding Details: Number: -, Acronym: CNOOC, Sponsor: China National Offshore Oil Corporation; Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: PLC2020055, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation;
Funding text: The authors would like to acknowledge CNOOC management for support and approval to publish this paper. The author Jie Cao would also like to thank the Natural Science Foundation of Shaanxi Province (No.2019JQ-525) and the Open Fund (PLC2020055) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

454. A wall-passing radar imaging algorithm based on weighted L1 norm

Accession number: 20211910343296
Authors: Mingshi, L.U.O. (1); Mengmeng, Zhang (1)
Author affiliation: (1) Xi'an Shiyou University, College of Computer Science, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
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Pages: 755-758
Article number: 9408799
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This article is mainly studied based on weighted L1 norm through-wall radar imaging algorithm. Due to the interference of the environment or the radar platform, the echo data acquired by the TWR system will be mixed with some noise, which seriously affects the imaging results. In this article, the weighted L1 norm constraint model is closer to the L0 norm constraint model through imaging comparison of the four algorithms in the case of no noise and -2dB Gaussian white noise. In other words, the quality and stability of the imaging are improved by improving the weighting function. © 2021 IEEE.
Number of references: 5
Main heading: Radar imaging
Controlled terms: White noise
Uncontrolled terms: Constraint model - Echo data - Gaussian white noise - Imaging algorithm - Through walls - Weighted L1 norm - Weighting functions
Classification code: 716.2 Radar Systems and Equipment
Numerical data indexing: Decibel -2.00e+00dB
DOI: 10.1109/ICSP51882.2021.9408799
Funding Details: Number: 2018SF409, Acronym: -, Sponsor: -;
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Data Provider: Engineering Village
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455. Noise acquisition system of underwater propulsion device based on LabVIEW

Accession number: 20213510848043
Authors: Li, Zhou-Li (1); Li, Fei-Xiang (1); Tian, Fu-Bin (1); Liang, Yu-Jia (1)

Author affiliation: (1) Xi'An Shiyou University, Measurement Control Instrument Lab, Xi'an, China
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Part number: 1 of 1
Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to improve the performance of underwater vehicle, the noise produced by underwater vehicle is studied. In this design, PXIe-6366 data acquisition module and computer are used as the main hardware. By mastering the application technology of virtual instrument, a noise data acquisition system with the functions of configuration, acquisition and data playback is designed. At the same time, the login module and user management module are designed to ensure the security and standardization of the system. © 2021 IEEE.
Number of references: 10
Main heading: Data acquisition
Controlled terms: Computer hardware
Uncontrolled terms: Acquisition systems - Application technologies - Data acquisition modules - Noise data - Underwater propulsion - Underwater vehicles - User management - Virtual instrument
Classification code: 722 Computer Systems and Equipment - 723.2 Data Processing and Image Processing
DOI: 10.1109/ICMSP53480.2021.9513366
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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456. Optimization Method of Output Power Quality of Z-Source Inverter Based on SVPWM (*Open Access*)

Accession number: 20212110398106
Authors: Hailong, Liu (1); Aiqing, Huo (1); Qizhi, Zhang (1); Hongliang, Yan (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Corresponding author: Qizhi, Zhang(zhangqz@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Article number: 012055
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Document type: Conference article (CA)

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Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: A linear modulation of SVPWM control strategy employed in Z-source inverter is proposed in this paper. The DC bus voltage is regulated by adjusting the shoot through duty based on load. The reference voltage vectors are limited in the inscribed circle of hexagon of basic voltage vectors. Overmodulation is avoided. The linear relationship between the peak value of the output voltage and the DC bus voltage is kept in all regions. The change of system load is responded by this control strategy. The system control algorithm is simplified and the output capability of the system is enhanced. To validate its advantages, analytical, simulation, and experimental results are also presented. © Published under licence by IOP Publishing Ltd.
Number of references: 20
Main heading: Electric inverters
Controlled terms: Pulse width modulation
Uncontrolled terms: Control strategies - Inscribed circles - Linear modulations - Linear relationships - Optimization method - Output voltages - Reference voltages - Z-source inverter
Classification code: 512.1.1 Oil Fields
DOI: 10.1088/1742-6596/1894/1/012055
Funding Details: Number: 290088265, Acronym: -, Sponsor: -; Number: 20JS123, Acronym: -, Sponsor: Education Department of Shaanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

457. Comic style transfer based on generative confrontation network

Accession number: 20211910343266
Authors: Wei, Tongtong (1); Zhu, Lianxiang (1)
Author affiliation: (1) Xi'an Shiyou University, College of Computer Science, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Pages: 1011-1014
Article number: 9408938
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Style transfer refers to extracting styles from a specified style image template, and mapping the extracted style features to the content image without destroying the image content. At present, the use of deep learning methods for style transfer is one of the hotspots in the field of image research. This paper implements an image style transfer architecture based on cyclic consistent generative adversarial network, i. e., cyclic consistent confrontation network, and uses densely connected convolutional network to deepen the number of network layers. Test results show that stylized image with the proposed method is more obvious than that of the original cyclic consistent generative adversarial network, and the image quality is improved apparently. © 2021 IEEE.
Number of references: 18
Main heading: Generative adversarial networks

Controlled terms: Image enhancement - Deep learning - Learning systems - Convolutional neural networks - Network layers
Uncontrolled terms: Adversarial networks - Architecture-based - Convolutional networks - Hotspots - Image content - Learning methods
Classification code: 461.4 Ergonomics and Human Factors Engineering - 723 Computer Software, Data Handling and Applications - 723.4 Artificial Intelligence
DOI: 10.1109/ICSP51882.2021.9408938
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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458. Research on Fund Forecasting Based on Long-Short Term Memory Network

Accession number: 20220711615852
Authors: Wei, Fan (1); Tian, Haojie (1)
Author affiliation: (1) Xi'An Shiyou University, Department of Computer Science, Xi'an, China
Source title: Proceedings - 2021 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Abbreviated source title: Proc. - Int. Symp. Comput. Inf. Process. Technol., ISCIPT
Part number: 1 of 1
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Issue date: 2021
Publication year: 2021
Pages: 254-257
Language: English
ISBN-13: 9781665441377
Document type: Conference article (CA)
Conference name: 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Conference date: June 11, 2021 - June 13, 2021
Conference location: Virtual, Changsha, China
Conference code: 175833
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In recent years, investment funds have become one of the important ways of financing. How to improve the return on investment has become a concern of the people. Forecasting the future trend of funds can help people make decisions. Different from other types of data, the fund data shows nonlinear and periodic changes over time, and the traditional model is not ideal in dealing with such data. Based on the application and research of long-short term memory network in the field of time series data mining, the characteristics of fitting complex time series data are applied to fund prediction in this paper, and a fund prediction model is established through long-short term memory network. The historical data of Tiantian Fund website are selected as the experimental data, and the model is trained and tested by using the experimental data. The results show that the long-short term memory network can predict the rise and fall of fund and the risk trend of fund. © 2021 IEEE.
Number of references: 8
Main heading: Data mining
Controlled terms: Forecasting - Long short-term memory - Big data - Brain - Time series - Investments
Uncontrolled terms: Change-over time - Fund prediction model - Future trends - Investment funds - Memory network - Nonlinear changes - Periodic changes - Prediction modelling - Returns on investment - Traditional models
Classification code: 461.1 Biomedical Engineering - 723.2 Data Processing and Image Processing - 922.2 Mathematical Statistics
DOI: 10.1109/ISCIPT53667.2021.00058
Compendex references: YES
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Data Provider: Engineering Village
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459. Research on Monster Path Planning Scheme in Horror Game Based on Whale optimization Algorithm

Accession number: 20211910343222

Authors: Ying, Cuan (1); Yuhang, Cheng (1); Yaodong, Wang (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This paper proposes a path planning algorithm based on the whale algorithm, which when used with A# algorithm can effectively control path-finding progress. The algorithm introduces the Bezier curve, the algorithm can better describe the curve path between two points, to replace the logarithmic spiral in the spiral update part of the original whale algorithm. In addition, temporarily changing target point put the path planned by the algorithm far away from the shortest path, and appropriately surrounds the target point. This paper's research object is the monster path-finding problem in horror games, and realizes the controllable non-shortest path planning under the special path environment. The algorithm planning result has better performance than the path planned by the A# algorithm. © 2021 IEEE.
Number of references: 12
Main heading: Motion planning
Controlled terms: Game design - Graph theory - Curve fitting
Uncontrolled terms: Logarithmic spiral - Optimization algorithms - Path finding problems - Path-planning algorithm - Planning scheme - Research object - Shortest path - Shortest path planning
Classification code: 723.5 Computer Applications - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods
DOI: 10.1109/ICSP51882.2021.9408889
Funding Details: Number: 201910705037, Acronym: -, Sponsor: National College Students Innovation and Entrepreneurship Training Program;
Funding text: Acknowledgments This work was supported by National College Student Innovation and Entrepreneurship Training Proj ect(201910705037)
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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460. Research on Automatic Recognition Algorithm of Pointer Meter Based on Machine Vision

Accession number: 20211910343144
Authors: Kang, Lei (1); Li, Hui (1); Zheng, Haowei (1); Li, Xin (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 265-268
Article number: 9408740
Language: English
ISBN-13: 9780738143705
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Pointer meters can directly reflect the changing trend of measured values, so they are widely used in industry field measurements. The digital reading of pointer meters is conductive to real-time data monitoring and management. The paper firstly describes the structural characteristics of the pointer meter, and briefly describes the preprocessing algorithm of the meter picture, and then uses the algorithm to complete the position of the dial and the pointer location relative to the dial. The pointer positioning is achieved by monitoring the edges on both sides of the pointer. Finally, the pointer reading is determined according to the position of the pointer scale relative to the minimum scale. The algorithm is not affected by the tilt of the dial, and the final recognition accuracy is one-fifth of the smallest scale. © 2021 IEEE.
Number of references: 10
Main heading: Computer vision
Uncontrolled terms: Automatic recognition - Changing trends - Digital reading - Field measurement - Pre-processing algorithms - Real-time data monitoring - Recognition accuracy - Structural characteristics
Classification code: 723.5 Computer Applications - 741.2 Vision
DOI: 10.1109/ICSP51882.2021.9408740
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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461. Wideband FM Anti-jamming Method of FMCW Radar

Accession number: 20211910343029
Authors: Jianli, Feng (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
Corresponding author: Jianli, Feng(fjlnwpu@xsyu.edu.cn)
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Triangular wave FMCW radar has been widely used in the field of target detection due to its advantages of large measurement range, simple structure and high degree of automation. However, the inherent non-linearity of the FM signal can easily cause the spectrum aliasing of the difference frequency signal, which not only reduces the effectiveness of the radar's range and speed measurement, but also increases the risk of radar being interfered. Numerous studies have focused on overcoming or compensating the nonlinearity of FM signals, but they can only achieve the narrow bandwidth linearity, and the anti-jamming capability of the radar has not been improved. In this paper, the FM signal is modulated using the frequency hopping technology. In addition, the frequency of FMCW radar hops in an ultra-wide bandwidth, so the influence of the aliasing of the difference frequency signal spectrum on the FMCW radar ranging can be overcome. Furthermore, the anti-jamming capability of FMCW radar has been greatly improved. © 2021 IEEE.
Number of references: 6
Main heading: Bandwidth
Controlled terms: Jamming - Risk assessment - Security systems - Frequency modulation - Radar measurement - Frequency hopping - Continuous wave radar

Uncontrolled terms: Anti-jamming capability - Degree of automation - Difference frequency - Frequency hopping technology - Measurement range - Spectrum aliasing - Speed measurement - Ultrawide bandwidth
Classification code: 711 Electromagnetic Waves - 716.1 Information Theory and Signal Processing - 716.2 Radar Systems and Equipment - 914.1 Accidents and Accident Prevention
DOI: 10.1109/ICSP51882.2021.9408835
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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462. Research on recognition of dangerous driving behavior based on support vector machine

Accession number: 20210809937587
Authors: Zhang, Liumei (1); Tan, Baoyu (1); Liu, Tianshi (1); Li, Jiao (1)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, 710065, China
Corresponding author: Zhang, Liumei(zhangliumei@xsyu.edu.cn)
Source title: Proceedings of SPIE - The International Society for Optical Engineering
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Article number: 117201L
Language: English
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Conference name: 12th International Conference on Graphics and Image Processing, ICGIP 2020
Conference date: November 13, 2020 - November 15, 2020
Conference location: Xi'an, China
Conference code: 167013
Sponsor: Chang'an University; et al.; Foshan University; Northwest A and F University; Ocean University of China; Sichuan University
Publisher: SPIE
Abstract: Research on dangerous driving behavior recognition is beneficial to regulate the driving behavior of drivers. As the existing algorithms are sensitive to noise, and abnormal data often affects the process of identifying dangerous driving behaviors. This paper proposes a novel driving behavior research method. Such method establishes a driving behavior recognition model based on Support Vector Machine (SVM) and oversampling. The experimental results show that the proposed model demonstrates a higher recognition rate. © 2021 SPIE.
Number of references: 10
Main heading: Support vector machines
Controlled terms: Behavioral research
Uncontrolled terms: Abnormal data - Dangerous drivings - Driving behavior - Over sampling - research methods
Classification code: 461.4 Ergonomics and Human Factors Engineering - 723 Computer Software, Data Handling and Applications - 971 Social Sciences
DOI: 10.1117/12.2589350
Funding Details: Number: 2019JQ-056, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 61802301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: YCS19113070, Acronym: -, Sponsor: -;
Funding text: This work is supported in part by the scholarship from National Natural Science Foundation of China(No. 61802301), Shaanxi Natural Science Foundation of China (No. 2019JQ-056), and Xi'an Shiyou University Graduate Innovation and Practical Ability Training Project (No. YCS19113070).
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463. Research on Automatic Bit Feeding Control System with Constant Weight on Bit Based on Fuzzy Predictive Control (*Open Access*)

Accession number: 20212110392468
Authors: Liu, Guangxing (1); Zhang, Yige (1); Cao, Xilin (1)
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Corresponding author: Liu, Guangxing(gxliu@xsyu.edu.cn)
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Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: According to the automatic bit feeding system of oil drilling rig has basic characteristics such as multi-variable, time-varying and nonlinear, an automatic bit feeding control system with constant weight on bit (WOB) based on fuzzy predictive control is proposed. The fuzzy predictive controller of WOB is designed, and the future output of the system is predicted by predictive control, and the output value of the system is close to the given value of WOB as much as possible by fuzzy control. The simulation results show that the response speed of the system is improved, which meets the requirements of small error and high precision, and has a certain guiding significance for the actual design and application. © Published under licence by IOP Publishing Ltd.
Number of references: 15
Main heading: Feeding
Controlled terms: Fuzzy control - Infill drilling - Materials handling equipment
Uncontrolled terms: Basic characteristics - Design and application - Fuzzy predictive controllers - Fuzzy-predictive controls - Guiding significances - Multi variables - Oil-drilling rig - Predictive control
Classification code: 511.1 Oil Field Production Operations - 691.1 Materials Handling Equipment - 691.2 Materials Handling Methods - 731 Automatic Control Principles and Applications
DOI: 10.1088/1742-6596/1894/1/012006
Funding Details: Number: 17JS107, Acronym: -, Sponsor: -;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
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464. Research on analogue of electromagnetically induced transparency effect based on asymmetric structure all-dielectric metamaterial (*Open Access*)

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Title of translation:
Authors: Zhang, Yue-Bin (1); Ma, Cheng-Ju (1); Zhang, Yao (1); Jin, Jia-Sheng (1); Bao, Shi-Qian (1); Li, Mi (1); Li, Dong-Ming (1)
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Article number: 194201
Language: Chinese
ISSN: 10003290
CODEN: WLHPAR
Document type: Journal article (JA)
Publisher: Institute of Physics, Chinese Academy of Sciences
Abstract: The electromagnetically induced transparency (EIT), which is a result of destructive interference between different excitation paths in a three-energy-level atomic medium, makes opaque probe light transparent over a range of frequencies. As this EIT effect is usually accompanied with strong dispersion, it has potential applications such as slow light propagation, optical buffering, nonlinear optics, optical sensing, etc. However, for conventional quantum EIT effect which requires stable gas lasers and low temperature environment, the implementation of EIT in chip-scale applications is severely hampered by the scathing experimental requirements. Recently, the EIT-like effect in metamaterials, which are constructed by designing the artificial subwavelength functional elements and arranging the spatial sequences, attracts tremendous attention because of its advantages, such as room temperature manipulability, large bandwidth, and small sizes. In addition, the high-quality factor(Q) value obtained by EIT-like effect has great significance in designing the metamaterial-based devices. In this paper, we design an EIT-like metamaterial with such a structure. The unit cell of the proposed metamaterial is constructed by two asymmetric silicon blocks embedded on a silicon dioxide substrate. Meanwhile, we analyze its optical properties and EIT-like effects by using three-dimension (3D) FDTD method. Based on the coupled Lorentz model, the EIT-like effect of the designed metamaterial is investigated. Then, by employing the electric field distribution on the surface of the metamaterial, and combining with the three-level atomic system, the mechanism of the EIT-like effect is analyzed in detail. We find that the EIT-like effect in the proposed metamaterial has high Q value ($Q \approx 8616$) and the high transmission (T = 96%). By changing the length of the silicon block to destroy the asymmetry of the metamaterial structure, an active tuning EIT-like effect is realized. Furthermore, the metamaterial structure has the advantages of low loss, easy preparation, and active-controllability. This study represents an innovative approach to designing the EIT-like metamaterial, which is expected to be useful for designing active tunable slow-light devices and highly sensitive optical sensors. Copyright © 2021 Acta Physica Sinica. All rights reserved.
Number of references: 24
Main heading: Metamaterials
Controlled terms: Slow light - Transparency - Quantum optics - Electric fields - Finite difference time domain method - Light - Silica - Temperature
Uncontrolled terms: All-dielectric metamaterial - Asymmetric structures - Atomic media - Coupling the lorenz model - Destructive interference - Electromagnetically-induced transparency - Excitation path - Metamaterial structures - Q-values
Classification code: 641.1 Thermodynamics - 701.1 Electricity: Basic Concepts and Phenomena - 741.1 Light/Optics - 921 Mathematics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science
Numerical data indexing: Percentage 9.60E+01%
DOI: 10.7498/aps.70.20210070
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465. Research on the Application of Gradient Descent Algorithm in Machine Learning

Accession number: 20220411503610
Authors: Wang, Xin (1, 2); Yan, Liting (1, 2); Zhang, Qizhi (1, 2)
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Conference name: 4th International Conference on Computer Network, Electronic and Automation, ICCNEA 2021
Conference date: September 24, 2021 - September 26, 2021
Conference location: Xi'an, China
Conference code: 174432
Sponsor: Belarusian State University of Transport; et al.; Missouri Western State University; State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Control (LANMC); University of Huddersfield; Xi'an Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The gradient descent algorithm is a type of optimization algorithm that is widely used to solve machine learning algorithm model parameters. Through continuous iteration, it obtains the gradient of the objective function, gradually approaches the optimal solution of the objective function, and finally obtains the minimum loss function and related parameters. The gradient descent algorithm is frequently used in the solution process of logical regression, which is a common binary classification approach. This paper compares and analyzes the differences between batch gradient descent and its derivative algorithms - stochastic gradient descent algorithm and mini- batch gradient descent algorithm in terms of iteration number, loss function through experiments, and provides some suggestions on how to pick the best algorithm for the logistic regression binary task in machine learning. © 2021 IEEE.
Number of references: 9
Main heading: Machine learning
Controlled terms: Stochastic systems - Learning algorithms - Gradient methods - Regression analysis - Optimization
Uncontrolled terms: Algorithm model - Gradient descent algorithms - Gradient-descent - Logistics regressions - Loss functions - Machine learning algorithms - Machine-learning - Modeling parameters - Objective functions - Optimization algorithms
Classification code: 723.4 Artificial Intelligence - 723.4.2 Machine Learning - 731.1 Control Systems - 921.5 Optimization Techniques - 921.6 Numerical Methods - 922.2 Mathematical Statistics - 961 Systems Science
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466. Research and design of an attention monitoring system based on head posture estimation

Accession number: 20211910343117
Authors: Wang, Hong (1); Xia, Yu (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer, Xi'an, Shaanxi, China
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Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Attention is one of the essential factors affecting learning effectiveness. The duration students focusing on the screen is a fundamental measure of concentration in the relaxed setting of using computers for experiments in universities. To effectively monitor students' attention in experimental teaching, we propose a method for measuring students' attention based on head posture estimation and provide a scheme design for a Raspberry Pi-based attention monitoring system by integrating the idea of edge computing. Firstly, the head angles of yaw and pitch are estimated using ERT and EPnP algorithms to determine whether the students' eyesight is within the screen range in the Raspberry Pi. Secondly, the results are transmitted wirelessly to the central server. To this end, a visual web page of the students' attention is provided based on these data to show and manage those devices. Experiments have shown that the system is feasible in detecting student attention and has broad application potential. © 2021 IEEE.
Number of references: 16
Main heading: Students
Controlled terms: Edge computing - Monitoring - Websites
Uncontrolled terms: Broad application - Central servers - Experimental teachings - Head angle - Head posture - Learning effectiveness - Monitoring system - Scheme design
Classification code: 722.4 Digital Computers and Systems
DOI: 10.1109/ICSP51882.2021.9408711
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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467. A randomized algorithm for approximating truncated SVD

Accession number: 20213510848128
Authors: Kaloorazi, Maboud F. (1); Wu, Dan (1); Gao, Guowang (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Corresponding author: Kaloorazi, Maboud F.(kaloorazi@xsyu.edu.cn)
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Publication year: 2021
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Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Matrices with low-rank structure are frequently encountered in a myriad of application domains, due to Big Data generation and consumption. Low-rank matrix decomposition algorithms, such as the truncated singular value decomposition (TSVD), play a pivotal role in processing and extracting patterns of such data matrices. We present in this work an algorithm termed Randomized Rank-k QLP (RR-QLP). It utilizes randomization and efficiently constructs a low-rank decomposition of an input matrix, thus providing an approximation to the TSVD. Its advantage

over TSVD, however, is that RR-QLP is computationally more efficient and can leverage the parallel structure of modern computers, thereby tackling a major bottle- neck associated with TSVD. To show the effectiveness of RR-QLP, different classes of data matrices are treated and the results are compared with those of several algorithms from the literature. © 2021 IEEE.
Number of references: 33
Main heading: Bottles
Controlled terms: Singular value decomposition
Uncontrolled terms: Data generation - Different class - Input matrices - Low-rank decomposition - Low-rank matrices - Parallel structures - Randomized Algorithms - Truncated singular value decomposition
Classification code: 694.2 Packaging Materials - 921 Mathematics
DOI: 10.1109/ICMSP53480.2021.9513402
Funding Details: Number: 2021GY-168, Acronym: -, Sponsor: -; Number: 2020KJRC0095, Acronym: -, Sponsor: -;
Funding text: ACKNOWLEDGMENT This work was supported in part by Key R&D Project of Shaanxi Province Grant No. 2021GY-168, and Xi'an Science and Technology Program Grant No. 2020KJRC0095.
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Data Provider: Engineering Village
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468. Study on evaluation model of rate grade of soil corrosion for pipeline

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Authors: Zhao, Zhi-Feng (1); Wu, Dan (1); Gao, Guo-Wang (1); Fan, Heng (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Corresponding author: Zhao, Zhi-feng(zfzhao@xsyu.edu.cn)
Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The purpose of this research is to improve the analysis of grade evaluation of soil corrosion rate for pipeline. With the characteristics of the existing mathematical models and the factors of pipeline soil corrosion, a combined mathematical model of the rough set, the decision tree and support vector machine (RS-DT-SVM) is proposed to evaluate the grade of soil corrosion rate for pipeline. This method utilizes the rough set (RS) and decision tree (DT) to manage by standardization analysis of the data of pipeline soil corrosion in the early stage. According to the characteristics of solving the problems of over learning, local minima, nonlinearity and dimension disaster, support vector machine (SVM) is used to build the intelligent evaluation of rate grade of soil corrosion. With algorithm characteristics of machine learning, it can be built without determining the specific function expression. Taking the actual and objective corrosion data of loam as an example, the model has a relative superiority in the evaluation grade analysis of multi-factor control system. It also provides a method guidance of evaluation grade of soil corrosion rate for pipeline. © 2021 IEEE.
Number of references: 16
Main heading: Support vector machines
Controlled terms: Corrosion rate - Complex networks - Decision trees - Pipelines - Rough set theory - Pipeline corrosion - Soils
Uncontrolled terms: Evaluation modeling - Intelligent evaluation - Local minimums - Multi factors - Soil corrosion

Classification code: 483.1 Soils and Soil Mechanics - 539.1 Metals Corrosion - 619.1 Pipe, Piping and Pipelines - 722 Computer Systems and Equipment - 723 Computer Software, Data Handling and Applications - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
DOI: 10.1109/ICMSP53480.2021.9513220
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469. A data model and algebraic operation for multidimensional analysis of oil and gas exploration data

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Authors: Jidong, Zhao (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
Corresponding author: Jidong, Zhao(zhaojidong@xsyu.edu.cn)
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Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Based on the functional requirements of the oil and gas exploration and development data warehouse and the characteristics of the multidimensional analysis language, this paper establishes a universal and reliable data cube model, and tries to design a set of easy-to-implement algebraic logic to support OLAP operations on the cube. This is a data warehouse and OLAP formal model centered on the multi-dimensional analysis function requirements of oil and gas exploration. Like all data and computing models, the purpose of this article is to make this model a basic service to effectively design and serve multidimensional query languages. © 2021 IEEE.
Number of references: 7
Main heading: Data warehouses
Controlled terms: Gases - Petroleum prospecting - Algebra - Query languages - Computation theory
Uncontrolled terms: Algebraic logic - Algebraic operations - Computing model - Function requirements - Functional requirement - Multi-dimensional analysis - Multi-dimensional queries - Oil and gas exploration
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 723.3 Database Systems - 921.1 Algebra
DOI: 10.1109/ICSP51882.2021.9408670
Compendex references: YES
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470. Employment Skill Recommendation of College Students Based on Parallel FP-Growth Algorithm

Accession number: 20220411514868
Authors: Yingzhuo, Xu (1); Yifan, Wang (1)

Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
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Document type: Conference article (CA)
Conference name: 2nd IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
Conference date: October 8, 2021 - October 10, 2021
Conference location: Xi'an, China
Conference code: 176101
Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE
Abstract: The degree of matching between the skills acquired by college students when applying for jobs and the skills required by companies for online recruitment of talents is low, resulting in a low employment rate. In response to this problem, it is proposed to apply the Spark-based parallel FP-Growth algorithm to the analysis of job requirements for recruitment information, extract the job skills corresponding to the job, and improve the matching degree between graduates and the recruitment market demand. Compared with the traditional FP-Growth algorithm, the Spark-based parallel FP-Growth algorithm has better mining for massive data sets. © 2021 SPIE
Number of references: 8
Main heading: Students
Controlled terms: Employment
Uncontrolled terms: College students - Degree of matching - Employment rates - Employment skill - FP-growth algorithm - Information extract - Job skills - Online recruitment - Parallel - Student-based
Classification code: 723.2 Data Processing and Image Processing
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471. Dynamic Optimization of Specialty Structure of Higher Education Based on Big Data Technology

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Authors: Cui, Huiping (1)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University, Xi'an, China
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Conference date: June 18, 2021 - June 20, 2021
Conference location: Virtual, Beijing, China
Conference code: 172706
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: At present, big data technology with big data collection, big data analysis and mining, machine learning and other technologies as the core has been widely used in many fields. Through deep mining and analysis of massive data, big data technology can accurately predict and judge the supply and demand of disciplinary professionals, thus providing strong support for the dynamic optimization of the specialty structure of higher education. Through building life cycle management plan of specialty structure of universities and colleges, this article determines the source of big data acquisition, and by using Naive Bayes Classifier classifies and describes the talent status data of the industry, establishes the data model, and statistics the current distribution of professional and technical talents, and uses the time series prediction method to predict the future demand trend of all kinds of professional and technical personnel of enterprise, to provide strong support for specialty structure optimization, thereby to achieve higher education specialty structure dynamic optimization. © 2021 IEEE.
Number of references: 6
Main heading: Life cycle
Controlled terms: Shape optimization - Data mining - Time series - Engineering education - Structural optimization - Learning systems - Professional aspects - Classification (of information) - Data acquisition - Information management - Big data - Forecasting
Uncontrolled terms: Big data technology - Data collection - Data technologies - Deep mining - Dynamic optimization - High educations - Massive data - Naive Bayes classifiers - Professional structure - Time series prediction
Classification code: 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 901.1 Engineering Professional Aspects - 901.2 Education - 903.1 Information Sources and Analysis - 921.5 Optimization Techniques - 922.2 Mathematical Statistics
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Database: Compendex
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472. A New FBG Thermal Liquid Flow Sensor

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Corresponding author: Yang, Kaiqing(2862328398@qq.com)
Source title: Guangzi Xuebao/Acta Photonica Sinica
Abbreviated source title: Guangzi Xuebao
Volume: 50
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Issue date: February 25, 2021
Publication year: 2021
Article number: 0206002
Language: Chinese
ISSN: 10044213
CODEN: GUXUED
Document type: Journal article (JA)
Publisher: Chinese Optical Society
Abstract: Fiber Bragg Grating (FBG) thermal flow sensors are only suitable for gas flow currently. In order to expand its application field, a new FBG thermal flow sensor that can be used for liquid flow measurement is designed. A heating ceramic sheet is used to provide heat at a constant power for the FBG thermal flow sensor. Different flow of liquid takes different heat when flow through the sensor. By detecting the change of FBG central wavelength, the temperature change of the sensor can be measured, and then the liquid flow can be deduced. Through temperature sensor test experiment and flow sensor test experiment, it is verified that the designed sensor can be used for liquid

flow measurement. The experimental results show that the flow measurement range of the sensor is 40.575~550.664 L/h. © 2021, Science Press. All right reserved.
Number of references: 22
Main heading: Fiber Bragg gratings
Controlled terms: Flow of gases - Flow measurement - Flowmeters - Liquids
Uncontrolled terms: Central wavelength - Ceramic sheets - Constant power - ITS applications - Liquid flow sensor - Measurement range - Temperature changes - Thermal flow sensor
Classification code: 631.1 Fluid Flow, General - 631.1.2 Gas Dynamics - 943.1 Mechanical Instruments - 943.2 Mechanical Variables Measurements
DOI: 10.3788/gzxb20215002.0206002
Funding Details: Number: 17JS105, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: Scientific Research Program Funded by Shaanxi Provincial Education Department (No.17JS105), Xi'an Shiyou University Postgraduate Innovation and Practice Ability Training Program (No.YCS20212128).
Compendex references: YES
Database: Compendex
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473. Resource clustering algorithm for cloud data centers

Accession number: 20221611983214
Authors: Song, Caili (1); Liang, Bin (1); Li, Jiao (1)
Author affiliation: (1) Computer School of Xi'an, Shiyou University, Shaanxi, Xi'an, China
Corresponding author: Liang, Bin(liangbinhehe@163.com)
Source title: Journal of Computational Methods in Sciences and Engineering
Abbreviated source title: J. Comput. Methods Sci. Eng.
Volume: 21
Issue: 5
Issue date: 2021
Publication year: 2021
Pages: 1575-1585
Language: English
ISSN: 14727978
Document type: Journal article (JA)
Publisher: IOS Press BV
Abstract: Recently, the virtual machine deployment algorithm uses physical machine less or consumes higher energy in data centers, resulting in declined service quality of cloud data centers or rising operational costs, which leads to a decrease in cloud service provider's earnings finally. According to this situation, a resource clustering algorithm for cloud data centers is proposed. This algorithm systematically analyzes the cloud data center model and physical machine's use ratio, establishes the dynamic resource clustering rules through k-means clustering algorithm, and deploys the virtual machines based on clustering results, so as to promote the use ratio of physical machine and bring down energy consumption in cloud data centers. The experimental results indicate that, regarding the compute-intensive virtual machines in cloud data centers, compared to contrast algorithm, the physical machine's use ratio of this algorithm is improved by 12% on average, and its energy consumption in cloud data center is lowered by 15% on average. Regarding the general-purpose virtual machines in cloud data center, compared to contrast algorithm, the physical machine's use ratio is improved by 14% on average, and its energy consumption in cloud data centers is lowered by 12% on average. Above results demonstrate that this method shows a good effect in the resource management of cloud data centers, which may provide reference to some extent. © 2021 - IOS Press
Number of references: 18
Main heading: Virtual machine
Controlled terms: E-learning - Information management - K-means clustering - Network security - Energy utilization - Machine learning - Green computing
Uncontrolled terms: Cloud data centers - Cloud service providers - Clustering rules - Datacenter - Deployment algorithms - Dynamic resources - Energy - Energy-consumption - K-means clustering algorithms - Virtual machine deployment
Classification code: 454 Environmental Engineering - 525.3 Energy Utilization - 723 Computer Software, Data Handling and Applications - 723.4 Artificial Intelligence - 723.5 Computer Applications - 903.1 Information Sources and Analysis
Numerical data indexing: Percentage 1.20E+01%, Percentage 1.40E+01%, Percentage 1.50E+01%
DOI: 10.3233/JCM-215225

Funding Details: Number: 2020KJRC0101, Acronym: -, Sponsor: -; Number: 61802301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-056, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: Youth Science Foundation Project of National Natural Science Foundation of China:Research on performance optimization of blockchain data communication considering trust and weight(61802301); Shaanxi Provincial Natural Science Basic Research Plan - General item (2019JQ-056); Xi'an Science and Technology Planning Project (2020KJRC0101). OYouth Science Foundation Project of National Natural Science Foundation of China:Research on performance optimization of blockchain data communication considering trust and weight(61802301); Shaanxi Provincial Natural Science Basic Research Plan – General item (2019JQ-056); Xi'an Science and Technology Planning Project (2020KJRC0101).
Compendex references: YES
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Data Provider: Engineering Village
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474. Design of Feature Selection Algorithm Based on Improved FCBF

Accession number: 20211910343134
Authors: Ying, Cuan (1); Wang, Gaowei (1); Li, Hang (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
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Article number: 9408729
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Feature selection is an indispensable step in data mining, and its core is to analyze and quantify the correlation and redundancy between features and classes. Firstly, in the FCBF feature selection method, we use the symmetric uncertainty measurement criterion to evaluate the correlation of each feature and class label, sort each correlation measure from small to large, select the appropriate threshold, and eliminate the features below the threshold; secondly, use the approximate Markov blanket principle to screen irrelevant features and redundant features, and finally select the optimal feature subset. In this feature selection method, the complementarity between features is rarely taken into account, and it is easy to have some complementary features which are helpful to classification in the eliminated redundant features. Therefore, a feature selection method based on correlation, redundancy and complementarity is proposed, which enters the complementarity measurement criterion on the basis of FCBF algorithm to select complementary features and improve the accuracy of feature selection. © 2021 IEEE.
Number of references: 15
Main heading: Redundancy
Controlled terms: Feature Selection - Uncertainty analysis - Data mining - Classification (of information) - Genetic algorithms
Uncontrolled terms: Complementary features - Correlation measures - Feature selection algorithm - Feature selection methods - Feature subset - Markov Blankets - Redundant features - Uncertainty measurements
Classification code: 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis - 922.1 Probability Theory
DOI: 10.1109/ICSP51882.2021.9408729
Funding Details: Number: 201910705049, Acronym: -, Sponsor: National College Students Innovation and Entrepreneurship Training Program;
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Database: Compendex

Data Provider: Engineering Village
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475. Effect of Tool Cone angle on Performance of Metal Seal for Expandable casing

Accession number: 20211910343227
Authors: Jianbing, Zhang (1); Haiying, Wang (1); Chengyin, Jiang (1); Chu, Luo (1); Luyan, Ju (1); Detao, Kong (1)
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Article number: 9408894
Language: English
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to select the size of the expansion cone angle suitable for the expandable casing joint with metal seal, the elastic-plastic finite element simulation analysis of the expandable casing joint with a typical metal seal structure was carried out, considering the geometric, material and contact nonlinear problems, by using LS/DYNA finite element explicit dynamic analysis software. The magnitude and distribution of the Mises equivalent stress during the expansion and the residual stress after the expansion, the deformation data of the metal seal structure, and the contact force between sealing surfaces were obtained. It is recognized that when the cone angle of the expansion cone is within the range of 5° to 6°, the best expansion effect on the expandable casing joint with metal sealing can be achieved. The expansion cone with the cone angle of more than 7° will make the joint lose its sealing performance after expansion. When the cone angle is less than 5°, the rebound at the end of the male thread after expansion is larger, and the structural integrity of the joint is reduced. The research results of this paper are helpful to provide reference for the optimization design of expansion tools used in expandable casing joints with metal seal. © 2021 IEEE.
Number of references: 9
Main heading: Metals
Controlled terms: Computer software - Elastoplasticity - Seals - Expansion - Finite element method
Uncontrolled terms: Analysis softwares - Contact nonlinear - Elastic-plastic finite element simulations - Equivalent stress - Expansion effect - Explicit dynamics - Optimization design - Sealing performance
Classification code: 619.1.1 Pipe Accessories - 723 Computer Software, Data Handling and Applications - 921.6 Numerical Methods - 951 Materials Science
DOI: 10.1109/ICSP51882.2021.9408894
Funding Details: Number: 51905426,51974251, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019D-5007-0305, Acronym: -, Sponsor: PetroChina Innovation Foundation; Number: 2020KW-015, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: The authors are grateful for the financial support from the National Natural Science Foundation of China (Nos. 51974251 and 51905426), Key Research and Development Program of Shaanxi(No. 2020KW-015) and Petro China Innovation Foundation(2019D-5007-0305).
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Data Provider: Engineering Village
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476. Optimization of Oil Pumping Decision Model Based on Radial Basis Function Neural Network

Accession number: 20211910343032
Authors: Song, Xinai (1); Wei, Hangxin (1)
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Publication year: 2021
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Article number: 9408838
Language: English
ISBN-13: 9780738143705
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at the problems of low production of single oil well, high energy consumption and production cost of pumping units in ultra-low permeability oilfields, the oil pumping decision model based on RBF neural network was studied to optimize the current intermittent pumping system in oil fields. In paper, the influencing factors of the pumping decision model of the pumping unit were analyzed firstly. Then a three-layer RBF neural network was created, and a dynamic adjustment algorithm for node center of network hidden layer was proposed, and a weight adaptive training algorithm was studied, in which the output error was satisfied through multiple iteration. Finally, the model simulation experiment was carried in Matlab, predicting the motor speed, threshold speed and stop time. With 3000 training samples, when the error was set to 0.0001, the RBF neural network achieved convergence after learning for 300 times. Compared with the network output when the error was set at 0.005, the predicted values of motor speed, threshold motor speed and stop time are closer to the actual values when 100 samples were tested. The simulation results has showed that it is reasonable and feasible to optimize oil pumping decision model of the pumping unit through RBF neural network. © 2021 IEEE.
Number of references: 14
Main heading: Errors
Controlled terms: Multilayer neural networks - MATLAB - Pumping plants - Pumps - Network layers - Radial basis function networks - Energy utilization - Iterative methods - Oil wells
Uncontrolled terms: Adaptive training algorithm - Dynamic adjustment - High energy consumption - Intermittent pumping - Multiple iterations - Radial basis function neural networks - RBF Neural Network - Ultra low permeability
Classification code: 446 Waterworks - 512.1.1 Oil Fields - 525.3 Energy Utilization - 618.2 Pumps - 723 Computer Software, Data Handling and Applications - 723.5 Computer Applications - 921 Mathematics - 921.6 Numerical Methods
DOI: 10.1109/ICSP51882.2021.9408838
Funding Details: Number: 2019KW-080, Acronym: -, Sponsor: Key Research and Development Projects of Shaanxi Province; Number: 2019JM-174, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: Shaanxi Province Basic Research Project of Natural Science (2019JM-174)Ac k n o w l e d g me n t This work was financially supported by Shaanxi Province Basic Research Project of Natural Science (2019JM-174) and Shaanxi Province Key Research & Development Project (2019KW-080).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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477. Estimating the blood glucose of serum optical spectrum using support vector regression

Accession number: 20210509874584
Authors: Li, Dongmin (1)
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Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 11761
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Conference name: 4th International Conference on Photonics and Optical Engineering
Conference date: October 15, 2020 - October 16, 2020
Conference location: Xi'an, China
Conference code: 166676
Sponsor: Chinese Optical Society; High-speed Photography and Photonics Committee of Chinese Optical Society; Optics and Photonics Society of Singapore; Shaanxi Optical Society; The Society of Photo-Optical Instrumentation Engineers (SPIE)
Publisher: SPIE
Abstract: Blood glucose monitoring is very important for individuals with diabetes due to its rate determining role in medication strength adjustment and observation of possible life-Threatening hypoglycemia. Of the many sensor modalities tried, the combination of electrical and optical measurement is among the most promising for continuous measurements. The traditional single optical method of acquiring data was simple. The complexity of blood components, and the influence of external factors, affected accuracy of the blood glucose. We proposed an accurate computational intelligent approach using support vector regression models to estimate blood glucose concentrations of serum samples by a multi-sensor system, based on near-infrared (NIR) absorption spectrum, rotating spectrum, Raman spectrum. The results are shown that prediction data meet the clinical accuracy. © COPYRIGHT SPIE. Downloading of the abstract is permitted for personal use only.
Number of references: 11
Main heading: Blood
Controlled terms: Optical data processing - Medical problems - Glucose - Regression analysis - Infrared devices - Absorption spectroscopy
Uncontrolled terms: Blood glucose concentration - Blood glucose monitoring - Continuous measurements - External factors - Multi-sensor systems - Near-infrared absorption - Optical measurement - Support vector regression models
Classification code: 461.2 Biological Materials and Tissue Engineering - 723.2 Data Processing and Image Processing - 804.1 Organic Compounds - 922.2 Mathematical Statistics
DOI: 10.1117/12.2586384
Funding Details: Number: 2018GY-062, Acronym: -, Sponsor: -;
Funding text: This work was supported by the Key R&D Planned Industrial Projects in Shaanxi Province under [Grant number 2018GY-062].
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Database: Compendex
Data Provider: Engineering Village
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478. Effect of the service temperature on the strength plasticity and fracture mechanism of cr-mo casing steel

Accession number: 20214211022513
Authors: Wei, Wenlan (1); Cao, Yinping (1); Cui, Lu (1); Cheng, Jiarui (1); Wei, Zebing (1); Guo, Longlong (1); Zhang, Yafei (1)
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Corresponding author: Cui, Lu(cuiluxa@hotmail.com)
Source title: Materials Science Forum
Abbreviated source title: Mater. Sci. Forum
Volume: 1035 MSF
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Issue title: Functional and Functionally Structured Materials V
Issue date: 2021
Publication year: 2021
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Language: English
ISSN: 02555476
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CODEN: MSFOEP
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Document type: Conference article (CA)
Conference name: 21st Chinese Materials Conference, CMC 2020
Conference date: November 17, 2020 - November 22, 2020
Conference location: Virtual, Online
Conference code: 266259
Publisher: Trans Tech Publications Ltd
Abstract: In recent years, the oil and gas well casing is confronted with more complex service environment, and the casing is subjected to higher service load and temperature. In this study, the strength and plasticity of Cr-Mo low alloy casing steel of 80, 90 and 110 steel grades commonly used under high temperature service conditions was studied. The results show that with the increase of temperature, the yield strength and tensile strength of casing steel decreased. The sensitivity of high steel grade to temperature change was higher than that of lower steel grade; with the increase of steel grade, the fracture mechanism of casing steel changed from microporous polymerization fracture induced by large size second phase particles to shear propagation fracture induced by sub grain boundary microporous polymerization. This study has important guiding significance for the service safety and strain design of high grade steel under high temperature conditions. © 2021 Trans Tech Publications Ltd, Switzerland.
Number of references: 11
Main heading: Fracture
Controlled terms: Microporosity - Tensile strength - Binary alloys - Molybdenum alloys - Molybdenum steel - Chromium alloys - Plasticity - Polymerization - Grain boundaries - Chromium steel
Uncontrolled terms: Casing - Complex services - CrMo steels - Fracture mechanisms - High-temperature tensile - Microporous - Oil and gas well - Service temperature - Steel grades - Strength
Classification code: 543.1 Chromium and Alloys - 543.3 Molybdenum and Alloys - 545.3 Steel - 815.2 Polymerization - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.4028/www.scientific.net/MSF.1035.350
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479. Methods to determine the upper limits of petrophysical properties in tight oil reservoirs: Examples from the Ordos and Songliao Basins

Accession number: 20204209358364
Authors: Bai, Yubin (1, 2); Zhao, Jingzhou (1, 2); Wu, Weitao (1, 2)
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Corresponding author: Bai, Yubin(baiyubin@xsyu.edu.cn)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 196
Issue date: January 2021
Publication year: 2021
Article number: 107983
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: In large petroliferous basins, tight and conventional reservoirs are widely distributed. These reservoirs have significant differences in formation mechanisms, enrichment rules, and development modes. Only when a reservoir petrophysical property is less than a certain upper limit can a large area of tight oil accumulation be formed. Therefore, it is necessary to scientifically define the petrophysical property boundary between tight and conventional

reservoirs. In the past, the determination of petrophysical property boundaries between tight and conventional reservoirs was based mainly on the statistics of a large number of measured petrophysical property data of typical tight oil basins and lacked theoretical research. Taking the Ordos and Songliao Basins as examples, this paper studies the petrophysical upper limits of tight reservoirs, starting with the reservoir-forming mechanism and characteristics of tight and conventional reservoirs. Based on four methods—the mechanical balance method assuming that the buoyancy and capillary pressure are equal, petrophysical simulation of an oil accumulation in sandstone, analysis of the distribution characteristics of the current petrophysical properties of conventional and tight oil reservoirs, and mercury injection porosimetry tests to determine the change in reservoir porosity and permeability with displacement pressure—this research determines that basically the same upper limits of tight reservoir properties are found among these methods. Obtained synthetically, the upper limit of permeability is approximately 1 md, corresponding to the upper limit of porosity of approximately 12%. These research results provide new ideas and methods to distinguish tight oil from conventional oil accumulations in petroliferous basins in different stages of exploration. © 2020 Elsevier B.V.
Number of references: 53
Main heading: Solvents
Controlled terms: Sandstone - Petroleum reservoir engineering - Petroleum prospecting - Mercury (metal) - Petroleum reservoirs - Petrophysics - Porosity
Uncontrolled terms: Displacement pressure - Distribution characteristics - Formation mechanism - Mechanical balance - Petroliferous basins - Petrophysical properties - Reservoir porosity - Theoretical research
Classification code: 481.1.2 Petrology (Before 1993, use code 482) - 482.2 Minerals - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 803 Chemical Agents and Basic Industrial Chemicals - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 1.20e+01%
DOI: 10.1016/j.petrol.2020.107983
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Funding text: This research was supported by the Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2017JM4014) and the Shaanxi Provincial Education Department (Program No. 18JS090). We sincerely thank the three anonymous reviewers for their comments, which greatly improved the quality of the paper.
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Data Provider: Engineering Village
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480. Investigation into phantom downlinks and development of a prevention algorithm in rotary steerable system (*Open Access*)

Accession number: 20220411493447
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Issue date: September 2021
Publication year: 2021
Pages: 349-355
Language: English
ISSN: 24056561
E-ISSN: 24055816
Document type: Journal article (JA)
Publisher: KeAi Communications Co.
Abstract: This paper investigated the failure cause of phantom downlinks of a flow rate detection mechanism in a rotary steerable system and developed a prevention algorithm. Downlinking is the process of controlling a drilling tool from the surface by sending commands to downhole. Directional drillers send downlinks to the rotary steerable system to adjust steering parameters to achieve the desired well plan. The downlink demodulation of downhole tools

is achieved through the measurement of flow rate and correlation of waveform with predefined command models; downlink acceptance is based on the correlation rate. One case study revealed that phantom downlinks were due to the variation of turbine rotation speed, which was the result of alternator load changes. A prevention algorithm of conducting a signal energy check was proposed and implemented. The algorithm can successfully prevent phantom downlinks that are usually of low-level energy and only accept authentic downlinks. The work improved the downlinking reliability of the rotary steerable system. This methodology can be further applied to other downlink demodulation mechanisms using collar speed or pressure measurement. © 2020 Southwest Petroleum University
Number of references: 19
DOI: 10.1016/j.petlm.2020.09.001
Funding Details: Number: 20JS125, Acronym: -, Sponsor: Education Department of Shaanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
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481. Research on Improved Stereo Matching Algorithm for Autonomous Obstacle Avoidance of UAV in Complex Indoor Environment

Accession number: 20221411915775
Authors: Bai, Junqing (1); Yin, Lei (1)
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Abbreviated source title: Proc. - Int. Semin. Artif. Intell., Netw. Inf. Technol., AINIT
Part number: 1 of 1
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Issue date: 2021
Publication year: 2021
Pages: 69-72
Language: English
ISBN-13: 9781665412964
Document type: Conference article (CA)
Conference name: 2nd International Seminar on Artificial Intelligence, Networking and Information Technology, AINIT 2021
Conference date: October 15, 2021 - October 17, 2021
Conference location: Virtual, Shanghai, China
Conference code: 177613
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The stereo matching of unmanned aerial vehicle (UAV) in complex indoor environment is affected by illumination changes, mutual occlusion between objects and other factors, and there are some defects in color/ brightness differences, noise, tilt plane and so on, which seriously affect the matching effect. To solve these problems, an optimization algorithm based on SIFT is proposed. Then the FAST algorithm is used to extract the feature points quickly. The improved SIFT is used to describe the feature points accurately. In the matching process, the Manhattan distance is used to calculate the similarity between the reference image and the image to be matched; Finally, the improved RANSAC algorithm is used to check the consistency and eliminate the mismatching points, which further reduces the time consumed by the algorithm. The EuRoC indoor binocular data set is used to verify the algorithm.Experimental results show that, compared with the SIFT algorithm, the proposed method not only improves the correct matching rate, but also ensures the matching performance, which has a certain engineering application value. © 2021 IEEE.
Number of references: 13
Main heading: Unmanned aerial vehicles (UAV)
Controlled terms: Aircraft detection - Antennas - Binocular vision - Color matching - Image enhancement - Image matching - Stereo image processing - Stereo vision

Uncontrolled terms: Autonomous obstacle avoidances - Colour brightness - FAST detection - Illumination changes - Indoor environment - Manhattan distance - RANSAC - SIFT algorithms - Stereo matching algorithm - Stereo-matching
Classification code: 652.1 Aircraft, General - 716.2 Radar Systems and Equipment - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 741.2 Vision
DOI: 10.1109/AINIT54228.2021.00023
Compendex references: YES
Database: Compendex
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482. Design of warehouse monitoring system based on ARM platform

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Authors: Yi, Gao (1); Yang, Jing (1); Yanhui, Mao (1); Chao, Guo (1)
Author affiliation: (1) Xi'an Shiyou University, School of Electronic Engineering, Xi'an, Shaanxi, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Language: English
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Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This article introduces a design scheme of warehouse environment monitoring system, the solution uses the tiny4412 development board and as the main control platform, using DHT11 and DS18B20 sensors to monitor the temperature and humidity of the warehouse environment in real time, display the measured temperature through LCD1602 analyze and judge data, sound and light alarm and SMTP mail alarm are performed when the measured data exceeds the set threshold. The actual effect of the system shows that the implementation of the system is feasible and can improve the efficiency of warehouse environmental monitoring. © 2021 IEEE.
Number of references: 15
Main heading: Monitoring
Controlled terms: Internet of things - Display devices - ARM processors - Humidity control
Uncontrolled terms: Control platform - Design scheme - Environment monitoring system - Environmental Monitoring - Measured temperatures - Monitoring system - Real time - Temperature and humidities
Classification code: 721 Computer Circuits and Logic Elements - 722.2 Computer Peripheral Equipment - 722.3 Data Communication, Equipment and Techniques - 723 Computer Software, Data Handling and Applications
DOI: 10.1109/ICSP51882.2021.9408826
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Funding text: Wemusthavetothanksfor the sponsorsandhelpfor this paper, which are: The natural science funds of China (51604226,51704238) ; Natural Science Foundation of Shaanxi (2019JQ-366,2018JM5064); Supported by Xi'an
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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483. Real-time monitoring and early warning of well leakage based on big data analysis (*Open Access*)

Accession number: 20212110398135
Authors: Yingzhuo, Xu (1); Liupeng, Wang (1); Yang, Zhang (1); Mingzhen, Li (1)

Author affiliation: (1) Xi'An Shiyou University, Yanta District, Xi'an City, Shaanxi Province, China
Source title: Journal of Physics: Conference Series
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Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
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Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: In petroleum drilling engineering operations, complex lost circulation accidents not only affect the efficiency of drilling operations, but serious lost circulation may cause wellbore failure. The occurrence of lost circulation accidents is affected by various factors such as formation conditions, engineering parameters, and operating dynamic parameters. The conventional focus of lost circulation research is to analyze the mechanism of lost circulation, but the data such as engineering parameters and operating dynamic parameters when lost circulation occurs are insufficiently utilized. At present, the field of drilling engineering has accumulated a large amount of historical drilling data, and the complicated occurrence of lost circulation accidents often has regional statistics. How to use big data technology to establish the correlation model between lost circulation and parameters, reason and analyze the main influencing factors of lost circulation, then use the established correlation model comparative analysis. After the data model comparative analysis, it can make different specifications of responses and early warnings for data anomalies with different weights, so as to reduce the impact on drilling operations while avoiding lost circulation accidents. © Published under licence by IOP Publishing Ltd.
Number of references: 7
Main heading: Accidents
Controlled terms: Oil wells - Infill drilling - Big data
Uncontrolled terms: Comparative analysis - Correlation modeling - Drilling engineering - Drilling operation - Engineering parameters - Formation condition - Petroleum drilling - Real time monitoring
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 723.2 Data Processing and Image Processing - 914.1 Accidents and Accident Prevention
DOI: 10.1088/1742-6596/1894/1/012084
Funding Details: Number: 2019JM-383, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: We are grateful to the Natural Science Basic Research Project of Shaanxi Province for their financial s upported under Grant No. 2019JM-383 for this paper.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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484. Application of improved whale optimization algorithm in crack image segmentation

Accession number: 20220711615666
Authors: Ying, Cuan (1); Xiaoxi, Xie (1)
Author affiliation: (1) Xi'An Shiyou University, School of Computer Science, Shaanxi, Xi'an, China
Source title: Proceedings - 2021 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
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Issue title: Proceedings - 2021 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
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Conference name: 6th International Symposium on Computer and Information Processing Technology, ISCIPT 2021
Conference date: June 11, 2021 - June 13, 2021
Conference location: Virtual, Changsha, China
Conference code: 175833
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In the process of urban construction, roads, bridges and other buildings that are prone to cracking and damage need to be found and repaired as soon as possible. However, the efficiency of artificial identification of cracks is very low, so the crack image segmentation method is more reasonable and efficient. In order to promote the speed and accuracy of crack image segmentation, whale optimization algorithm was applied to crack image segmentation of symmetric cross entropy, and in the original algorithm is the initialization phase of chaos search strategy was proposed, the algorithm of surrounded by adaptive weight is adopted in feeding mechanism and a new convergence factor, the algorithm has better ergodicity, balance the global and local search capabilities, avoid falling into local extrema. The simulation results show that the improved algorithm can improve the convergence speed and precision, and can obtain better crack segmentation effect. © 2021 IEEE.
Number of references: 17
Main heading: Image segmentation
Controlled terms: Optimization - Entropy - Image enhancement - Bridges
Uncontrolled terms: Chaotic mapping - Crack image - Crack image segmentation - Cross entropy - Images segmentations - Optimization algorithms - Symmetric cross entropy - Symmetrics - Urban construction - Whale optimization algorithm
Classification code: 401.1 Bridges - 641.1 Thermodynamics - 921.5 Optimization Techniques
DOI: 10.1109/ISCIPT53667.2021.00128
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Funding text: We are grateful to Wang Jingyi's project, the Research on Natural Computing Theory and Method of Machine Vision for Simulation and Detection of Oil and Gas Well Casing Loss, No.2019KW-045, and the Innovation and Practice Ability Training Program of Xi'an Shiyou University for their contributions to this paper.We are grateful to Wang Jingyi s project, the Research on Natural Computing Theory and Method of Machine Vision for Simulation and Detection of Oil and Gas Well Casing Loss, No.2019KW-045, and the Innovation and Practice Ability Training Program of Xian Shiyou University for their contributions to this paper.Project YCS20123032 Supported by Xi an Shiyou University Graduate Student Innovation and Practical Ability Training Program.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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485. Inversion method of horizontal well boundary detection based on geo-steering electromagnetic wave measuring instrument (*Open Access*)

Accession number: 20212110398102
Authors: Xie, Xicao (1); Wu, Jie (1)
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Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: Based on the adaptive damping Gauss-Newton Inversion Algorithm, this paper studies the inversion method of the horizontal well boundary detection by the geo-potential electromagnetic wave measuring instrument. Based on the drilling trajectory and logging data of a real horizontal well, the simulation inversion is used to detect the position of formation boundary, and the validity of the inversion method is verified. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Horizontal wells
Controlled terms: Electromagnetic waves - Circular waveguides
Uncontrolled terms: Adaptive damping - Boundary detection - Gauss Newton - Inversion algorithm - Inversion methods - Logging data - Measuring instruments
Classification code: 512.1.1 Oil Fields - 711 Electromagnetic Waves - 714.3 Waveguides
DOI: 10.1088/1742-6596/1894/1/012051
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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486. Study of X-ray Image Defect Detection Methods for Girth Welds

Accession number: 20220411514811
Authors: Wang, Dan (1); Gao, Weixin (2)
Author affiliation: (1) College of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) College of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Gao, Weixin(269216768@qq.com)
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Article number: 1207925
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Conference name: 2nd IYSF Academic Symposium on Artificial Intelligence and Computer Engineering
Conference date: October 8, 2021 - October 10, 2021
Conference location: Xi'an, China
Conference code: 176101
Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE
Abstract: This paper summarizes the research results on defect segmentation and recognition by researchers at home and abroad. Through analysis, it is found that deep learning has an absolute advantage in seam defect segmentation

based on X-ray. In the field of weld defect identification, the application of intelligent algorithm has become the mainstream of research. © 2021 SPIE
Number of references: 49
Main heading: Defects
Controlled terms: Welds - Image segmentation - Deep learning
Uncontrolled terms: Defect detection method - Defect identification - Defect segmentation - Girth weld - Image defect detection - Intelligent Algorithms - Research results - Seam defects - Weld defects - X-ray image
Classification code: 461.4 Ergonomics and Human Factors Engineering - 538.2 Welding - 951 Materials Science
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Funding Details: Number: 2020GY-179, Acronym: -, Sponsor: -; Number: YCS21113137, Acronym: -, Sponsor: -;
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Database: Compendex
Data Provider: Engineering Village
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487. Enumeration of perfect matchings of a special class of graphs

Accession number: 20220411514896
Authors: Gao, Nan (1)
Author affiliation: (1) College of Science, Xi'an Shiyou University, Shaanxi, Xi'an; 710065, China
Corresponding author: Gao, Nan(gaonankk@163.com)
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Conference location: Xi'an, China
Conference code: 176101
Sponsor: et al.; Faculty Work Department of Party Committee, Faculty Development Center (Office of High-Level Talent) of Xi'an Shiyou University; School of Electronic Engineering, Xi'an Shiyou University; School of Materials Science and Engineering, Xi'an Shiyou University; School of Science, Xi'an Shiyou University; Young Teacher Association of Xi'an Shiyou University
Publisher: SPIE
Abstract: In this paper, we enumerate perfect matchings of a special class of graphs by the Pfaffian method, which was discovered by Kasteleyn. Primary discussion for the skew energy of a Pfaffian digraph. © 2021 SPIE
Number of references: 6
Main heading: Optical engineering
Uncontrolled terms: Energy - matrix - Perfect matchings - Pfaffian - Pfaffian orientation - Skew adjaceency matrix - Skew energy - Special class
DOI: 10.1117/12.2622714
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488. High-performance computing system and smart speech pattern findings for intangible cultural heritage art analysis considering visual information

Accession number: 20214111015557
Authors: Zhou, Mingyong (1); Fang, Nannan (1)
Author affiliation: (1) School of Humanities, Xi'an Shiyou Univercity, Shaanxi, Xian; 710065, China
Source title: Proceedings of the 3rd International Conference on Inventive Research in Computing Applications, ICIRCA 2021
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Conference date: September 2, 2021 - September 4, 2021
Conference location: Coimbatore, India
Conference code: 172137
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This paper studies the visual application of highperformance computing systems and artificial language recognition in intangible cultural heritage art design. First, this article introduces the advantages, disadvantages, problems and performance evaluation of high-performance computing systems in the new era. Then, a high-performance computer-based artificial language recognition algorithm is used to classify and recognize intangible cultural heritage art. Finally, use the network database and artificial language recognition algorithm to visualize the intangible cultural heritage art design. © 2021 IEEE.
Number of references: 23
Main heading: Visual languages
Controlled terms: Arts computing
Uncontrolled terms: Art analysis - Artificial language recognition - Arts designs - High performance computing systems - Intangible cultural heritages - Language recognition - Patterns finding - Recognition algorithm - Speech patterns - Visual applications
Classification code: 723.1.1 Computer Programming Languages - 723.2 Data Processing and Image Processing
DOI: 10.1109/ICIRCA51532.2021.9544576
Compendex references: YES
Database: Compendex
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489. Establishment of simulation model of water injection pipeline cleaning technology and evaluation of cleaning effect

Accession number: 20213510848142
Authors: Li, Hui (1); Ruan, Yan (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xsyu, Xi'an, China
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Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The scaling of the water injection pipeline seriously affects the water injection efficiency. Current research is generally limited to the selection of suitable cleaning technology, and there are too few studies on the cleaning effect. In this paper, after analyzing the scaling mechanism and scaling evaluation model of the water injection pipeline, a simulation system is designed based on the GUI interface of the MATLAB platform to simulate the cleaning effect. The original data of the oilfield water injection pipeline can be imported into the simulation system, the cleaning technology can be selected and its cleaning effect can be simulated, and the evaluation method of the cleaning effect is given in the paper. The cleaning result can be obtained by comparing the data before and after cleaning. Based on the original data of an oil field, this paper carried out a simulation of the cleaning effect of chemical cleaning, and reached a conclusion that the cleaning effect was obvious. Application examples show that the water injection trunk lines that need to be cleaned in the two water injection stations have been obviously improved after cleaning, but the cleaning effect of different water injection stations is different, so the cleaning technology can be adjusted in time according to the simulation, which is more conducive to the choice of pipeline cleaning technology, thereby improving water injection efficiency. © 2021 IEEE.
Number of references: 10
Main heading: MATLAB
Controlled terms: Chemical cleaning - Efficiency - Simulation platform - Offshore oil well production - Pipelines
Uncontrolled terms: Application examples - Cleaning technology - Evaluation modeling - Injection efficiency - Pipeline cleaning - Scaling mechanism - Simulation model - Simulation systems
Classification code: 511.1 Oil Field Production Operations - 619.1 Pipe, Piping and Pipelines - 723.5 Computer Applications - 802.3 Chemical Operations - 804 Chemical Products Generally - 913.1 Production Engineering - 921 Mathematics
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490. Global Lorentz estimates for hypoelliptic operators with drift on homogeneous group

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Authors: Hou, Yuexia (1)
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Corresponding author: Hou, Yuexia(yxhou@xsyu.edu.cn)
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Conference name: 2021 International Conference on Electronic Information Engineering and Computer Technology, EIECT 2021

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Conference location: Kunming, China
Conference code: 176915
Sponsor: Academic Exchange Information Center (AEIC)
Publisher: SPIE
Abstract: The hypoelliptic operators with drift appears in many research fields, for instance, mathematical finance theory, kinetics and models of human vision. In this paper, we establish the Lorentz boundedness of fractional integral operators on homogeneous group, then applying this result and the relevant properties of the fundamental solutions, we obtain global Lorentz estimates of hypoelliptic operators with drift. These estimates expand the regularity of operators generated by vector fields. © 2021 SPIE.
Number of references: 10
Main heading: Mathematical operators
Controlled terms: Estimation
Uncontrolled terms: Boundedness - Finance theory - Fractional integrals - Homogeneous group - Human vision - Hypoelliptic operator - Lorentz - Lorentz functions - Mathematical Finance - Research fields
Classification code: 921 Mathematics
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Data Provider: Engineering Village
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491. Mechanical injury accident of petroleum enterprise based on the fault tree analysis

Accession number: 20220411503663
Authors: Jing, Luo (1); Jing, Zhang (1)
Author affiliation: (1) Xi'An Shiyou University School of Economics and Management, Xi'an, China
Corresponding author: Jing, Zhang(zzzzzj950416@163.com)
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Issue title: Proceedings - 2021 International Conference on Management Science and Software Engineering, ICMSSE 2021
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Language: English
ISBN-13: 9781665425650
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Conference name: 2021 International Conference on Management Science and Software Engineering, ICMSSE 2021
Conference date: July 9, 2021 - July 11, 2021
Conference location: Chengdu, China
Conference code: 174681
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This paper takes the mechanical injury accidents of petroleum companies as the research object. Through the establishment of a fault tree of the causes of mechanical injury accidents in petroleum enterprises, the analytic hierarchy process is used to classify and analyze the basic event factor indicators in the mechanical injury accident indicators. Finally this paper determined the index weight of various factors and provided effective basis for oil production safety management. The study shows that human factors are the main source of mechanical injury accidents in petroleum enterprises, followed by management factors, while environmental factors have a relatively small impact on mechanical injury accidents in petroleum enterprises. Therefore, for petroleum enterprises, it is necessary to pay attention to improving the safety quality and risk identification ability of employees, and at the same time, an effective safety supervision system should be established to escort the production safety of petroleum enterprises. © 2021 IEEE.
Number of references: 8
Main heading: Fault tree analysis
Controlled terms: Petroleum industry - Accidents - Gasoline
Uncontrolled terms: Fault tree analyses (FTA) - Injury accidents - Mechanical injury - Mechanical injury accident - Petroleum companies - Petroleum enterprise - Production safety - Production safety management - Research object - Safety management

Classification code: 523 Liquid Fuels - 914.1 Accidents and Accident Prevention
DOI: 10.1109/ICMSSE53595.2021.00042
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Database: Compendex
Data Provider: Engineering Village
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492. Design of RFID-Based Low Frequency Tag in Intelligent Well

Accession number: 20211910343243
Authors: Wang, Yuelong (1); Zhang, Ke (1); Yan, Liting (1); Mao, Yanhui (1)
Author affiliation: (1) Xi'an Shiyou University, School of Electronic Engineering, Xi'an, Shaanxi, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
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Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to realize the data transmission requirements of intelligent wells, this paper analyzes the matching relationship between the radio frequency electronic tag and the antenna of the reader, and proposes a method of designing a downhole communication system using radio frequency identification technology (RFID). First of all, it is preferable to establish communication between the electronic tag and the reader in a suitable frequency band. Then, the reading function of the reader's data and the transmission capacity of the two encapsulated electronic tags are theoretically analyzed, and the number of turns of the reader's antenna and the radio frequency electronic tag is determined. Finally, through experimental verification, the temperature resistance and pressure resistance of the electronic tag are analyzed. The experimental results show that the radio frequency electronic tag can successfully realize the collection and transmission of data and information, and meet the needs of downhole information transmission. © 2021 IEEE.
Number of references: 10
Main heading: Design
Controlled terms: Radio frequency identification (RFID) - Radio waves - Radio transmission
Uncontrolled terms: Experimental verification - Information transmission - Pressure resistance - Radio frequency identification technology - Suitable frequency bands - Temperature resistances - Transmission capacities - Transmission of data
Classification code: 711 Electromagnetic Waves - 716.3 Radio Systems and Equipment - 731.1 Control Systems
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493. Research on vision positioning algorithm of UAV landing based on vanishing point

Accession number: 20213510848119
Authors: Huang, Quanzhou (1); Feng, Peiyuan (1)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University, Shaanxi, Xi'an, China
Corresponding author: Feng, Peiyuan(1055410658@qq.com)

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Issue title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
Conference date: July 23, 2021 - July 25, 2021
Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Regarding the visual positioning of the autonomous landing of UAVs, this paper proposes a pose calculation method that uses the spatial geometric characteristics of the vanishing point of parallel lines and the principle of camera imaging to calculate the position and pose of the UAV. At the same time, a new symbol judgment mechanism is added to the original method to improve the accuracy of pose estimation and provide a new solution for UAV landing pose estimation. © 2021 IEEE.
Number of references: 9
Main heading: Unmanned aerial vehicles (UAV)
Controlled terms: Landing
Uncontrolled terms: Autonomous landing - Geometric characteristics - Parallel line - Pose estimation - Vanishing point - Vision positioning - Visual positioning
Classification code: 652.1 Aircraft, General
DOI: 10.1109/ICMSP53480.2021.9513393
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Database: Compendex
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494. A skin effect correction method for hostile array compensated true resistivity tool (HCRT)

Accession number: 20213510848134
Authors: Wu, Jie (1); Liu, Jin (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Shaanxi, Xi'an, China
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Source title: 2021 3rd International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2021
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Conference location: Xi'an, China
Conference code: 171360
Sponsor: IEEE
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Hostile Array Compensated True Resistivity Tool (HCRT) has the characteristics of high resolution, complex intrusion interpretation and stratigraphic analysis, which can be effectively used in reservoir evaluation of ultra-deep wells. Skin effect is one of the important sources of measurement error in induction logging. Therefore, skin effect correction is needed in the process of logging signal analysis and processing. According to the tricyclic system theory and electromagnetic field theory, a new skin effect correction method that can be applied to HCRT is proposed. The corresponding database is constructed by using the combination of three frequency correction and normalization correction. The true conductivity of non-uniform formation is calculated by linear interpolation. The correction results show that the corrected formation response is more linear and the apparent conductivity is closer to the true conductivity. © 2021 IEEE.
Number of references: 6
Main heading: Induction logging
Controlled terms: Electromagnetic fields - Skin effect - Electromagnetic wave attenuation - Stratigraphy
Uncontrolled terms: Apparent conductivity - Effect corrections - Frequency correction - High resolution - Linear Interpolation - Resistivity tools - Stratigraphic analysis - Ultra-deep wells
Classification code: 481.1 Geology - 512.1.2 Petroleum Deposits : Development Operations - 701 Electricity and Magnetism - 701.1 Electricity: Basic Concepts and Phenomena - 711 Electromagnetic Waves
DOI: 10.1109/ICMSP53480.2021.9513409
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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495. Intelligent traffic control system based on open IoT and machine learning

Accession number: 20211610235450
Authors: Chen, Jiaona (1); Liu, Hailong (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an, Shaanxi, China
Corresponding author: Liu, Hailong
Source title: Journal of Intelligent and Fuzzy Systems
Abbreviated source title: J. Intelligent Fuzzy Syst.
Volume: 40
Issue: 4
Issue date: 2021
Publication year: 2021
Pages: 7001-7012
Language: English
ISSN: 10641246
E-ISSN: 18758967
Document type: Journal article (JA)
Publisher: IOS Press BV
Abstract: Smart transportation relies on data collection, transmission, processing, and release, involving various terminal devices, control systems, central platforms, and communication links, so its control process is more complicated. In order to improve the operation efficiency of the intelligent traffic control system, based on the open Internet of Things and machine learning, this paper builds an intelligent three-way intelligent traffic control system, sets various parameters, and builds a simulation model using cellular automata as a platform. Moreover, in order to study the performance of the model, the model constructed in this paper is compared with the model of the traditional road traffic control system. In addition, this paper analyzes the model constructed in this paper through the statistics of the highest vehicle flow on the road and the relationship between road occupancy and vehicle speed. The research results show that the model constructed in this paper has good performance and can be applied to intelligent traffic control. © 2021 - IOS Press. All rights reserved.
Number of references: 29
Main heading: Internet of things
Controlled terms: Machine learning - Road vehicles - Roads and streets - Simulation platform - Control systems
Uncontrolled terms: Control process - Data collection - Intelligent traffic controls - Operation efficiencies - Research results - Road traffic control - Simulation model - Terminal devices

Classification code: 406.2 Roads and Streets - 722.3 Data Communication, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 723.4 Artificial Intelligence - 723.5 Computer Applications - 731.1 Control Systems
DOI: 10.3233/JIFS-189531
Funding Details: Number: -, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2020GY-152, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: The research in this paper was supported by Shaanxi Provincial Education Department Project: Research on the Influence of Traveler Characteristics on the Expressway Travel Time Reliability. The Key Research and Development Program of Shaanxi Province (No. 2020GY-152).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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496. Application Research of ID3 Attribute Optimization Algorithm Based on Correlation Coefficient

Accession number: 20211910343107
Authors: Gang, Ma (1); Liumei, Zhang (1); Yimin, Cheng (1); Quancheng, Zhang (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, Shaanxi, China
Source title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Abbreviated source title: IEEE Int. Conf. Intell. Comput. Signal Process., ICSP
Part number: 1 of 1
Issue title: 2021 IEEE 6th International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Issue date: April 9, 2021
Publication year: 2021
Pages: 279-283
Article number: 9408700
Language: English
ISBN-13: 9780738143705
Document type: Conference article (CA)
Conference name: 6th IEEE International Conference on Intelligent Computing and Signal Processing, ICSP 2021
Conference date: April 9, 2021 - April 11, 2021
Conference location: Xi'an, China
Conference code: 168663
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: As the traditional ID3 algorithm information entropy calculation method, it is prone to problems such as multi-value bias, large calculation amount and low efficiency. An improved ID3 algorithm is constructed based on Spearman's rank correlation coefficient, and the concept of conditional attribute correlation coefficient is introduced when calculating conditional attribute information gain, which optimizes the selection of conditional attributes, and can greatly simplify the construction of decision trees. Experimental data analysis shows that the accuracy of classification rules has also been greatly improved. © 2021 IEEE.
Number of references: 7
Main heading: Decision trees
Uncontrolled terms: Accuracy of classifications - Application research - Attribute information - Correlation coefficient - Experimental data analysis - Information entropy - Optimization algorithms - Spearman's rank correlation coefficients
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
DOI: 10.1109/ICSP51882.2021.9408700
Funding Details: Number: 2020Q017, Acronym: -, Sponsor: -;
Funding text: Acknowl edgment This work was financially supported by Shaanxi Social Science Foundation Project (2020Q017).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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497. Research and Application of Knowledge Decision Method for Optimal and Fast Drilling in Emergency Rescue Wells (*Open Access*)

Accession number: 20212110392503
Authors: Yingzhuo, Xu (1); Mingzhen, Li (1); Yang, Zhang (1); Zixiang, Yin (1)
Author affiliation: (1) Xi'An Shiyou University, Yanta District, Xi'an City, Shaanxi Province, China
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1894
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Issue date: May 6, 2021
Publication year: 2021
Article number: 012041
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Control, Measurement and Signal Processing and Intelligent Oil Field, ICMSP 2020
Conference date: December 4, 2020 - December 6, 2020
Conference location: Xi'an, Shaanxi, China
Conference code: 168936
Publisher: IOP Publishing Ltd
Abstract: The efficiency of coal mine emergency rescue work is limited by the professionalism of decision-making, the efficiency of rescue team formation and the rate of resource mobilization. Knowledge sharing and inheritance have important reference meanings for improving the efficiency and success of rescue work. In order to improve the efficiency of rescue work, this article builds A knowledge base that meets the needs and research on key content[1]. This article first analyzes the knowledge engineering, knowledge representation and knowledge storage of emergency rescue well drilling; secondly, based on the analysis of the emergency rescue well work flow, it classifies the knowledge of fast drilling, and studies the knowledge expression based on ontology[2]. Construct the ontology model of knowledge and establish the knowledge base; then, in view of the shortcomings in the current knowledge retrieval, apply the full-text search to the retrieval of the fast drill-in knowledge, construct the retrieval model and design the index structure of the knowledge base, on this basis The ranking of knowledge retrieval is optimized. Finally, combine the retrieved knowledge and follow the emergency rescue process to form a set of decision-making plans. Through the application of the case study in this article, it is shown that the standardized management of the knowledge of excellent and fast drilling in emergency rescue wells is realized, the speed and quality of the acquisition of knowledge of excellent and fast drilling are improved, and the efficiency and professionalism of decision-making are improved. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Decision making
Controlled terms: Efficiency - Ontology - Infill drilling - Information retrieval - Knowledge representation - Coal mines
Uncontrolled terms: Full-text search - Knowledge expression - Knowledge retrieval - Knowledge storage - Knowledge-sharing - Research and application - Resource mobilization - Retrieval models
Classification code: 503.1 Coal Mines - 511.1 Oil Field Production Operations - 723.4 Artificial Intelligence - 903.3 Information Retrieval and Use - 912.2 Management - 913.1 Production Engineering
DOI: 10.1088/1742-6596/1894/1/012041
Funding Details: Number: 2019JM-383, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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498. Image style transfer based on improved convolutional neural

Accession number: 20222912364587
Authors: Sun, Kun (1); Jing, Mingli (1); Hu, Yuliag (1); Jiao, Yao (1)

Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Jing, Mingli(mljsy@xsyu.edu.cn)
Source title: Proceedings - 2021 2nd International Conference on Artificial Intelligence and Computer Engineering, ICAICE 2021
Abbreviated source title: Proc. - Int. Conf. Artif. Intell. Comput. Eng., ICAICE
Part number: 1 of 1
Issue title: Proceedings - 2021 2nd International Conference on Artificial Intelligence and Computer Engineering, ICAICE 2021
Issue date: 2021
Publication year: 2021
Pages: 575-579
Language: English
ISBN-13: 9781665421867
Document type: Conference article (CA)
Conference name: 2nd International Conference on Artificial Intelligence and Computer Engineering, ICAICE 2021
Conference date: November 5, 2021 - November 7, 2021
Conference location: Hangzhou, China
Conference code: 180337
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Image style transfer is a hot issue in the field of computer vision. It refers to the process that an image (content image) has a specified artistic style (style image) through the algorithm, which has an important application value. The complex spatial structure in the process of style transfer will make the details blurred and the local structure of the image distorted. In this paper, a new feature detection network is introduced for feature extraction of style content and style content, which has fewer simple parameters. In the transformation network, the adaptive Instance standardization layer is added after the convolution layer to improve the retention ability of the spatial structure of the content image. Large convolution kernels are replaced to reduce the number of model parameters while maintaining the same receptive field. The network model built in this paper can realize the rapid migration of various styles, strengthen the structural characteristics of images, and improve the detail effect of stylized images significantly. © 2021 IEEE.
Number of references: 16
Main heading: Convolutional neural networks
Controlled terms: Convolution - Deep neural networks - Feature extraction - Image enhancement - Transfer learning
Uncontrolled terms: Convolutional neural network - Deep learning - Detection networks - Features detections - Features extraction - Image content - Images processing - Local structure - Spatial structure - Style transfer
Classification code: 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence
DOI: 10.1109/ICAICE54393.2021.00114
Funding Details: Number: 290088266, Acronym: -, Sponsor: -; Number: YSC20113036, Acronym: -, Sponsor: -; Number: 2020GY-152, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: ACKNOWLEDGMENTS This work was financially supported by the Graduate Innovation Fund of Xi'an Shiyou University (YSC20113036), the Key Research and Development Program of Shanxi Province (2020GY-152) and the Doctoral Innovation Fund of Xi'an Shiyou University (290088266). Thanks to Fan Ruibo for his help with this paper.
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Data Provider: Engineering Village
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499. Numerical study of geothermal district heating from a ground heat exchanger coupled with a heat pump system

Accession number: 20204909586062
Authors: Zhang, Xiong (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Applied Thermal Engineering
Abbreviated source title: Appl Therm Eng
Volume: 185
Issue date: February 25, 2021
Publication year: 2021

Article number: 116335
Language: English
ISSN: 13594311
CODEN: ATENFT
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Two important problems are often encountered in the application of middle-deep geothermal heat pump (MD-GHP) systems: (1) large deviations between the operating and design conditions and (2) the lack of a theoretical basis for parameter control during actual operations. Accurate heat transfer and energy conversion models of MD-GHP must be established to solve these problems. The novelty of this work lies in its establishment of a complete unsteady heat transfer model of a ground heat exchanger (GHE) and the coupling of this model with the energy conversion model of a heat pump. The influences of key design and control parameters on the coefficient of performance (COP) of MD-GHP are then studied. The use of vacuum insulated tubes as central pipes can increase the COP of the system by approximately 10%. When the well depth increases from 2000 m to 3000 m, the maximum heating load increases nearly linearly from 500 kW to 960 kW. At the bottom 20% of the well, insulation of the central pipe does not obviously increase the COP of the system. An optimal circulation rate occurs in MD-GHP, and this rate increases with the well depth. When the well depth increases from 2000 m to 3000 m, the optimal circulation rate increases from 6.7 kg/s to 9.9 kg/s. When the average heating load is kept constant, the intermittent heating mode slightly affects the average COP of the system. The thermal conductivity of the cement sheath exerts minimal effects on the COP of the system. The overall merit of this work is that a mathematical relationship between the heating load and formation temperature distribution is established to predict the energy efficiency of the whole system. This study provides important theoretical guidance for the design and control of MD-GHP. © 2020 Elsevier Ltd
Number of references: 23
Main heading: Energy efficiency
Controlled terms: Cements - Geothermal heat pumps - Pumps - Thermal conductivity - District heating - Geothermal energy - Energy conversion
Uncontrolled terms: Coefficient of performances (COP) - Design and control - Energy conversion models - Geothermal district heating - Ground heat exchangers - Intermittent heating - Mathematical relationship - Unsteady heat transfer
Classification code: 412.1 Cement - 481.3.1 Geothermal Phenomena - 525.2 Energy Conservation - 525.5 Energy Conversion Issues - 615.1 Geothermal Energy - 616.1 Heat Exchange Equipment and Components - 618.2 Pumps - 641.1 Thermodynamics - 641.2 Heat Transfer - 643.1 Space Heating
Numerical data indexing: Mass_Flow_Rate 6.70e+00kg/s to 9.90e+00kg/s, Percentage 1.00e+01%, Percentage 2.00e+01%, Power 5.00e+05W to 9.60e+05W, Size 2.00e+03m to 3.00e+03m
DOI: 10.1016/j.applthermaleng.2020.116335
Funding Details: Number: 2019JQ-826, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This study is supported by Natural Science Foundation of Shaanxi province of China [grant number 2019JQ-826].
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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500. Stable Platform Research on Control Method of Fully Rotary Steerable Drilling Tool

Accession number: 20220411503616
Authors: Yan, Liting (1); Wang, Xin (1); Zhang, Ke (1)
Author affiliation: (1) School Of Electronic Engineering, Xi'an Shiyou University, Shanxi, Xi'an, China
Source title: Proceedings - 2021 International Conference on Computer Network, Electronic and Automation, ICCNEA 2021
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2021 International Conference on Computer Network, Electronic and Automation, ICCNEA 2021
Issue date: 2021
Publication year: 2021
Pages: 294-298
Language: English
ISBN-13: 9781665444866
Document type: Conference article (CA)
Conference name: 4th International Conference on Computer Network, Electronic and Automation, ICCNEA 2021

Conference date: September 24, 2021 - September 26, 2021
Conference location: Xi'an, China
Conference code: 174432
Sponsor: Belarusian State University of Transport; et al.; Missouri Western State University; State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Control (LANMC); University of Huddersfield; Xi'an Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Rotary steering drilling is a drilling technique in which the bit's drilling path is controlled by an electronic control device (steering tool) located near the bit as the drill column rotates. The guidance tool's center is the stability control platform, which plays a critical role in guidance control. The effect of eccentric action torque on platform motion is studied using the simulation method, and the PID control method is proposed to resolve the problem that large-scale variation of drilling fluid flow affects the control efficiency of the platform. A feed-forward compensation method for turbine motor voltage is proposed to address the problem that PID control can only achieve stable control in a narrow flow range. The digital analog hybrid device structure is built to realize the power, and the signal operation circuit of voltage feed-forward control is designed and realized, according to the concept of voltage feed-forward angle feedback control process. The circuit's test results show that its signal operation accuracy meets control criteria, and its temperature characteristics meet the needs of underground workers. © 2021 IEEE.
Number of references: 10
Main heading: Feedforward control
Controlled terms: Flow of fluids - Three term control systems - Infill drilling - Simulation platform
Uncontrolled terms: Control methods - Drilling path - Drilling techniques - Drilling tool - Electronic control devices - Rotary steering - Rotary-steerable drilling - Stable platform - Steerable drillings - Voltage feed-forward
Classification code: 511.1 Oil Field Production Operations - 631.1 Fluid Flow, General - 723.5 Computer Applications - 731 Automatic Control Principles and Applications - 731.1 Control Systems
DOI: 10.1109/ICCNEA53019.2021.00071
Funding Details:
Funding text: This research is supported by the foundation project: Xi’an Shiyou University’s Graduate Innovation and Practical Ability Training Program.This research is supported by the foundation project: Xi'an Shiyou University's Graduate Innovation and Practical Ability Training Program
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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1. A 3D FIB-SEM technique for quantitative characterization of oil shale's microstructure: A case study from the Shahejie Formation in Dongying Depression, China (*Open Access*)

Accession number: 20204009257439
Authors: Zhao, Jianpeng (1, 2); Dong, Xu (3); Zhang, Jinyan (4); Chen, Hui (5); Zhang, Wenjiao (4)
Author affiliation: (1) College of Earth Sciences & Engineering, Xi'an Shiyou University, Xi'an, China; (2) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an, China; (3) Key Laboratory of Continental Shale Hydrocarbon Accumulation and Efficient Development, Ministry of Education, Northeast Petroleum University, Daqing, China; (4) Well Logging Company, Sinopec Shengli Oilfield Service Corporation, Dongying, China; (5) Changqing Division, China Petroleum Logging CO. LTD., Xi'an, China
Corresponding authors: Zhao, Jianpeng(zjpsnow@126.com); Zhao, Jianpeng(zjpsnow@126.com)
Source title: Energy Science and Engineering
Abbreviated source title: Energy Sci. Eng.
Volume: 9
Issue: 1
Issue date: January 2021
Publication year: 2021
Pages: 116-128
Language: English
E-ISSN: 20500505
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: Investigating the pore structure of shale rocks plays an important role in understanding the mechanism of shale oil accumulation and migration; thus, it has a notable influence on the exploration and development of shale oil resources. In the present study, the microstructure of oil shale samples extracted from the Shahejie Formation in the Dongying Depression was investigated through the joint usage of focused ion beam (FIB) and scanning electron microscopy (SEM). Herein, we selected four representative samples. The SEM images of the sample surfaces milled by FIB indicated that pores were found in both the organic and inorganic matter. Organic pores were less developed in the samples because of the low thermal maturity of the organic matter. Continuous 3D digital rock images of shale samples were generated by FIB grinding and SEM in situ imaging. Based on multithreshold segmentation, the shale rocks were separated into different parts including kerogen, inorganic matter, and pores. The pore connectivity and pore size distributions were analyzed via Avizo software and in-house developed MATLAB scripts. The pore size and corresponding volume distributions suggested that mesoscale pores (2-50 nm) were abundant in the samples but they contributed limitedly to the total pore volume. Macropores (>50 nm) accounted for a small proportion but they had a greater contribution to the overall pore space volume. The coordination numbers of the subject four samples were mainly 0 and 1, which means that isolated pores accounted for the vast majority of the pores. These observations are critical to conduct reliable petrophysical simulations in the oil shales and understand their intrinsic properties accurately. © 2020 The Authors. Energy Science & Engineering published by Society of Chemical Industry and John Wiley & Sons Ltd
Number of references: 60
Main heading: Pore structure
Controlled terms: Petroleum prospecting - Pore size - Rocks - MATLAB - Scanning electron microscopy - Ion beams
Uncontrolled terms: Coordination number - Dongying depression - Exploration and development - Intrinsic property - Multi-threshold segmentation - Quantitative characterization - Representative sample - Volume distributions
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 723.5 Computer Applications - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 932.1 High Energy Physics - 951 Materials Science
DOI: 10.1002/ese3.819
Funding Details: Number: 41804125, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 18JK0619, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2018JQ4043, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was supported in part by the National Natural Science Foundation of China (41804125), the Natural Science Basic Research Program of Shaanxi (2018JQ4043), and the Scientific Research Program funded by the Shaanxi Provincial Education Department (18JK0619).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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2. Experimental investigation on gas-liquid two-phase flow distribution characteristics in parallel multiple channels

Accession number: 20211810307152
Authors: Feng, Zongrui (1); Li, Huixiong (1); Liu, Jialun (2); Ni, Shiyao (3); Wang, Siqi (4)
Author affiliation: (1) State Key Laboratory of Multiphase Flow in Power Engineering, School of Energy & Power Engineering, Xi'an Jiaotong University, Xi'an; Shaanxi; 710049, China; (2) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) Department of Engineering, University of Cambridge, Trumpington Street, Cambridge; CB2 1PZ, United Kingdom; (4) Shanghai Marine Diesel Engine Research Institute, Shanghai; 201108, China
Corresponding author: Li, Huixiong(huixiong@mail.xjtu.edu.cn)
Source title: Experimental Thermal and Fluid Science
Abbreviated source title: Exp. Therm. Fluid Sci.
Volume: 127
Issue date: September 1, 2021
Publication year: 2021
Article number: 110415
Language: English
ISSN: 08941777
CODEN: ETFSEO
Document type: Journal article (JA)
Publisher: Elsevier Inc.
Abstract: The maldistribution in the parallel multiple channels commonly leads to a reduction in the efficiency of heat exchangers and even causes the equipment to suffer the risk of failure. The distribution of gas–liquid two-phase slug flow when moving through the parallel multiple channels is still an unresolved problem and limited by the lack of experimental data. This work presents an experimental study on the air–water two-phase flow in the parallel multiple channels characterized by a horizontal header and 2~4 vertically-upward branches under the slug flow pattern conditions and develops a new predictive model. The effects of inlet superficial velocities and branch number have been investigated in the ranges of inlet gas and liquid superficial velocities of 1.4~25.0 and 0.2~1.7 m·s-1, respectively. Results show that the distribution characteristics of two-phase slug flow highly depend on the inlet superficial velocities which manifest in that the peak value of liquid phase flow ratio shifts to the downstream branches sequentially as the inlet superficial velocities increase. Decreasing the branch number is beneficial for the uniform distribution of each phase. A predictive model is proposed for the distribution of air–water slug flow by considering the effects of superficial velocities and branch number. The new model achieves the agreement of 91.3% for prediction distribution within the range of ±25% when compares to present experimental data and shows good agreement with previously reported experimental results of both T-junction and parallel multiple channels. The acquired experimental data and predictive model are crucial for the development and optimal design of the heat exchangers. © 2021 Elsevier Inc.
Number of references: 48
Main heading: Heat exchangers
Controlled terms: Liquids - Velocity - Two phase flow - Flow patterns
Uncontrolled terms: Distribution characteristics - Distribution of gas - Experimental investigations - Gas - liquid two-phase flows - Liquid superficial velocities - Predictive modeling - Superficial velocity - Uniform distribution
Classification code: 616.1 Heat Exchange Equipment and Components - 631.1 Fluid Flow, General
Numerical data indexing: Percentage 9.13e+01%
DOI: 10.1016/j.expthermflusci.2021.110415
Funding Details: Number: 2015CB251502, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: This work was supported by the National Basic Research Program of China (973 Program, Grant No. 2015CB251502).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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3. Quantitative analysis of polycyclic aromatic hydrocarbons in soil by infrared spectroscopy combined with hybrid variable selection strategy and partial least squares

Accession number: 20211510213399

Authors: Li, Maogang (1); Feng, Yaozhou (1); Yu, Yan (2); Zhang, Tianlong (1); Yan, Chunhua (1); Tang, Hongsheng (1); Sheng, Qinglin (1, 3); Li, Hua (1, 4)
Author affiliation: (1) Key Laboratory of Synthetic and Natural Functional Molecular of the Ministry of Education, College of Chemistry & Materials Science, Northwest University, Xi'an; 710127, China; (2) College of Life Science, Northwest University, Xi'an; 710127, China; (3) College of Food Science and Technology, Northwest University, Xi'an; 710069, China; (4) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Tang, Hongsheng(tanghongsheng@nwu.edu.cn)
Source title: Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy
Abbreviated source title: Spectrochim. Acta Part A Mol. Biomol. Spectrosc.
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Issue date: August 5, 2021
Publication year: 2021
Article number: 119771
Language: English
ISSN: 13861425
CODEN: SAMCAS
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Infrared spectroscopy (IR) combined with multivariate calibration technology can be used as a potential method to quantitative analysis of polycyclic aromatic hydrocarbons (PAHs) in soil, which provides a rapid data support for soil risk assessment. However, IR spectrum contains lots of useless information, its predictive performance is poor. Variable selection is an effective strategy to eliminate irrelevant wavelengths and enhance predictive performance. In this study, IR combined with partial least squares (PLS) was proposed to quantify anthracene and fluoranthene in soil. In order to improve the predictive performance of the PLS calibration model, the synergy interval PLS (siPLS) method was first used for "rough selection" to select feature bands; on this basis, "fine selection" was performed to extract the feature variables. In "fine selection", three different feature variables selection methods, such as successive projection algorithm (SPA), genetic algorithm (GA), and particle swarm optimization (PSO), were compared for their performance in extracting effective variables. The results show that the siPLS-GA calibration model receive a lowest root mean square error (RMSE) and a largest determination coefficient (R2). Results of external validation demonstrate an excellent predictive performance of siPLS-GA calibration model, with the R2 = 0.9830, RMSE = 0.5897 mg/g and R2 = 0.9849, RMSE = 0.4739 mg/g for anthracene and fluoranthene, respectively. In summary, siPLS combined with GA can accurately extract the effective information of the target substance and improve the predictive performance of the PLS calibration model based on IR spectroscopy. © 2021 Elsevier B.V.
Number of references: 43
Main heading: Infrared spectroscopy
Controlled terms: Spectrum analysis - Anthracene - Aromatization - Principal component analysis - Mineral oils - Particle swarm optimization (PSO) - Least squares approximations - Risk assessment - Soils - Feature extraction - Genetic algorithms - Mean square error
Uncontrolled terms: Calibration model - Fluoranthene - Hybrid variable selection - Infrared: spectroscopy - Partial least squares calibrations - Partial least-squares - Polycyclic aromatics - Predictive performance - Root mean square errors - Variables selections
Classification code: 483.1 Soils and Soil Mechanics - 513.3 Petroleum Products - 723 Computer Software, Data Handling and Applications - 802.2 Chemical Reactions - 804.1 Organic Compounds - 914.1 Accidents and Accident Prevention - 921.5 Optimization Techniques - 921.6 Numerical Methods - 922.2 Mathematical Statistics
Numerical data indexing: Mass 4.739E-07kg, Mass 5.897E-07kg
DOI: 10.1016/j.saa.2021.119771
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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4. Easily Fabricated Low-Energy Consumption Joule-Heated Superhydrophobic Foam for Fast Cleanup of Viscous Crude Oil Spills

Accession number: 20214611145303

Authors: Li, Zhangdi (1); Tian, Qiong (1); Xu, Jicheng (2); Sun, Shouzhen (3); Cheng, Ying (4); Qiu, Fengxian (1); Zhang, Tao (1)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Jiangsu University, Jiangsu Province, Zhenjiang; 212013, China; (2) Zhenjiang Key Laboratory of Functional Chemistry, Institute of Medicine and Chemical Engineering, Zhenjiang College, Zhenjiang; 212028, China; (3) Liaohe Oilfield Company of China, National Petroleum Corporation, Liaoning Province, Panjin; 124011, China; (4) School of Mechanical Engineering, Xi'An Shiyou University, Shaanxi Province, Xi'an; 710065, China
Corresponding authors: Qiu, Fengxian(fxqiu@ujs.edu.cn); Zhang, Tao(zhangtaochem@163.com)
Source title: ACS Applied Materials and Interfaces
Abbreviated source title: ACS Appl. Mater. Interfaces
Volume: 13
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Pages: 51652-51660
Language: English
ISSN: 19448244
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Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Effective cleanup of viscous crude oil spills remains a persistent and crippling challenge. Herein, this work presents a Joule-heated superhydrophobic flower-like Cu8(PO3OH)2(PO4)4·7H2O-coated copper foam (SHB-CF@CP) for rapid cleanup of viscous crude oil spills via a facile strategy. The SHB-CF@CP shows outstanding water repellency and excellent stability of hydrophobicity in harsh environments. Due to the high electrical conductivity and thermal conductivity, it requires lower power energy consumption (less than 1 V of voltage input) to raise the temperature significantly, which dramatically reduces the viscosity of crude oil (from $_{\sim 2}$ × 105 to $_{\sim 60}$ mPa s) and then increases the oil absorption rate, effectively avoiding the poor mobility and ineffective absorption of viscous crude oil. Notably, the SHB-CF@CP can achieve continuous and quick cleanup of crude oil under in situ pumping force. The high-performance Joule-heated SHB-CF@CP sorbent with a strong porous skeleton, corrosion resistance, and low predicted operational costs holds a promise of promoting its practical applications in the cleanup of intractable and large-area viscous oil spills. © 2021 American Chemical Society.
Number of references: 31
Main heading: Oil spills
Controlled terms: Crude oil - Thermal conductivity - Energy utilization - Hydrophobicity - Corrosion resistance - Desalination
Uncontrolled terms: Cleanup - Copper foam - Crude oil spills - Harsh environment - High electrical conductivity - Joules heating - Low energy consumption - Superhydrophobicity - Viscous crude oil - Water-repellency
Classification code: 445.1 Water Treatment Techniques - 453.1 Water Pollution Sources - 512.1 Petroleum Deposits - 525.3 Energy Utilization - 539.1 Metals Corrosion - 641.1 Thermodynamics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Pressure 6.00E-05Pa, Voltage 1.00E00V
DOI: 10.1021/acsami.1c13574
Funding Details: Number: KYCX21_3388, Acronym: -, Sponsor: -; Number: 2019-2021, Acronym: -, Sponsor: -; Number: 202008, Acronym: -, Sponsor: -; Number: SH2021004, Acronym: -, Sponsor: -; Number: 21706100,21878132, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020M681740,2021T140578, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: BK20211126, Acronym: -, Sponsor: Natural Science Foundation of Jiangsu Province; Number: -, Acronym: -, Sponsor: Qinglan Project of Jiangsu Province of China;
Funding text: The authors thank the financial support from the National Natural Science Foundation of China (21706100 and 21878132), Natural Science Foundation of Jiangsu Province (BK20211126), China Postdoctoral Science Foundation (2020M681740 and 2021T140578), Postgraduate Research and Practice Innovation Program of Jiangsu Province (KYCX21_3388), "169 Project" Scientific Research Project of Zhenjiang City (2019-2021), Zhenjiang Science & Technology Program (SH2021004), Qing Lan Project of Jiangsu Province, and Xingtai Polytechnic College Application Innovation Project (202008). The authors would like to thank Weiwei Wang from Shiyanjia Lab (www.shiyanjia.com) for the XPS characterization.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

5. Study and Application of Heat Self-generated gases Flooding for Enhance Heavy Oil Recovery with Low-frequency High-power Harmonic Wave (*Open Access*)

Accession number: 20210910000337
Authors: Guowei, Qin (1); Yanzhao, Zheng (1); Rongbo, Jin (2); Jing, Wang (3); Beilei, Zhang (1); Qiao, Wang (4); Mei, Wu (5)
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Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
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Part number: 1 of 1
Issue: 1
Issue title: 2020 2nd International Conference on Civil Engineering, Environment Resources and Energy Materials
Issue date: February 4, 2021
Publication year: 2021
Article number: 012085
Language: English
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Document type: Conference article (CA)
Conference name: 2020 2nd International Conference on Civil Engineering, Environment Resources and Energy Materials, CCESEM 2020
Conference date: September 18, 2020 - September 20, 2020
Conference location: Changsha, China
Conference code: 167040
Publisher: IOP Publishing Ltd
Abstract: Heat self-generated gases flooding with low-frequency high-power harmonic wave(LFHPHW) is a new technology combining of LFHPHW enhanced oil recovery, steam flooding, and gas flooding and so on. Its main mechanism is to improve the fluidity and reduce heavy oil viscosity and oil-water interfacial tension with self-generated gases (CO2, NH3, etc.). They can be further reduced by synergism effect with LFHPHW, which can improve the heavy oil fluidity and displacement efficiency to enhance heavy oil recovery. The results of this new technology show that it has many advantages and can enhance heavy oil recovery(EHOR). © Published under licence by IOP Publishing Ltd.
Number of references: 7
Main heading: Fluidity
Controlled terms: Crude oil - Enhanced recovery - Oil well flooding - Floods - Ammonia - Heavy oil production
Uncontrolled terms: Displacement efficiency - Enhanced oil recovery - Heavy oil recovery - Low-frequency - Oil viscosity - Steamflooding - Study and applications - Synergism effects
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1088/1755-1315/634/1/012085
Compendex references: YES
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6. Gridlike 3d-4f heterometallic macrocycles for highly efficient conversion of CO2 into cyclic carbonates

Accession number: 20214411101489
Authors: Yang, Huan (1); Xie, Yujie (2); Chen, Wanmin (1); Tang, Xiaoliang (1); Hu, Mingyang (1); Shu, Ying (1); Wang, Li (3); Liu, Weisheng (1)
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Corresponding author: Wang, Li(lwang2018@xsyu.edu.cn)
Source title: Journal of CO2 Utilization
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Volume: 54
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Publication year: 2021
Article number: 101780
Language: English
ISSN: 22129820
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Recycle CO2 as a chemical feedstock and as renewable energy generated sustainable solution benefiting both environment and economy. However, advancements in highly efficient CO2 conversion at ambient condition are still hampered, mainly due to the inherent thermodynamic stability of CO2 which lead to the low conversion efficiency and required harsh catalyzing conditions (high temperature, high pressure, and toxic solvents, etc.). In this study, two unique gridlike 3d-4f heterometallic structures Ln8Zn4L6 have been successfully constructed (Ln = Eu(1), Tb(2), H4L = 2,2'-oxybis (N'-((E)-2-hydroxy-3-methoxybenzylidene) acetohydrazide)). The multimetal centers and functional ligand within these Ln8Zn4L6 assembles greatly increased the efficiency of CO2 fixation and promoted the catalysis of CO2 at greener conditions like atmospheric pressure and solvent free. Meanwhile, such heterometallic design showed enhanced stability without being influenced by moisture and impurities. As a proof of concept, these catalysts were further applied in direct catalyzing the simulated flue gas (15 % CO2/85 % N2) in practice and successfully afforded the value-added cyclic carbonate in decent yields. Therefore, the design of such 3d-4f heterometallic macrocycles provided a general and efficient approach for realizing CO2 conversion at greener conditions, which showed great potential in the next generation of CO2 based sustainable chemistry. © 2021
Number of references: 82
Main heading: Carbon dioxide
Controlled terms: Catalysts - Thermodynamic stability - Atmospheric pressure - Carbonates - Cycloaddition
Uncontrolled terms: 3d-4f catalyst - CO2 cycloaddition - Condition - Cyclic carbonates - Cycloadditions - Grid-like - Heterometallics - Inorganic chemistry - Macrocycles -]+ catalyst
Classification code: 443.1 Atmospheric Properties - 641.1 Thermodynamics - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 1.50E+01%, Percentage 8.50E+01%
DOI: 10.1016/j.jcou.2021.101780
Funding Details: Number: 21431002,21871122, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: lzujbky-2018-kb12, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: 2020JQ-763, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was supported by the National Natural Science Foundation of China (Grant No. 21871122 , 21431002), the Fundamental Research Funds for the Central Universities (Grant No. lzujbky-2018-kb12), and the Natural Science Basic Research Program of Shaanxi (Program No. 2020JQ-763).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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7. Effect of Temperature on Microstructure and Properties of CoCrCuFeNi High Entropy Alloy by Spark Plasma Sintering

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Title of translation: CoCrCuFeNi
Authors: Xia, Hongyong (1); Dong, Longlong (2); Huo, Wangtu (2); Tian, Ning (3); Zhou, Yue (4); Zhao, Panchao (2); Zhou, Lian (1, 2); Zhang, Yusheng (5)
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Corresponding author: Dong, Longlong(donglong1027@163.com)
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Language: Chinese
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CODEN: XJCGEA
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Publisher: Science Press
Abstract: CoCrCuFeNi high-entropy alloy was successfully fabricated by spark plasma sintering (SPS) at 900, 1000, 1100 and 1150. The tensile at room temperature results show that the tensile strength of the CoCrCuFeNi alloy firstly increases and then decreases with the increase of sintering temperature. However, the uniform elongation firstly significantly increases and then decreases. When the sintering is carried out at 1100, the yield strength and ultimate tensile strength of CoCrCuFeNi alloy reach 379.3 and 655.6 MPa, respectively, and the elongation after fracture is 21.9%. When sintering temperature exceeds 1100, the element segregation obviously appears in the material because of the local melting. Besides, the tensile fracture is brittle feature along the surface of the spherical powder at 900.While the fracture is ductile fracture as the sintering temperature increases. Because of the diffusion of carbon atom during high temperature sintering, TEM results show that the carbon reacts with the matrix to form the second phase carbide particles inside the matrix. © 2021, Science Press. All right reserved.
Number of references: 32
Main heading: Spark plasma sintering
Controlled terms: High-entropy alloys - Cobalt alloys - Copper alloys - Ductile fracture - Iron alloys - Entropy - Carbides - Carbon - Chromium alloys - Tensile strength
Uncontrolled terms: Effects of temperature - High entropy alloys - Local melting - matrix - Microstructure and properties - Sintering temperatures - Spark-plasma-sintering - Tensile fractures - Ultimate tensile strength - Uniform elongation
Classification code: 531 Metallurgy and Metallography - 543.1 Chromium and Alloys - 544.2 Copper Alloys - 545.2 Iron Alloys - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 641.1 Thermodynamics - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 812.1 Ceramics
Numerical data indexing: Percentage 2.19E+01%, Pressure 3.793E+08Pa, Pressure 6.556E+08Pa
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

8. Single-atom-based catalysts for photoelectrocatalysis: challenges and opportunities (*Open Access*)

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Authors: Liu, Dong (1, 2); Wan, Xueying (1); Kong, Tingting (3); Han, Weiwei (3); Xiong, Yujie (2)
Author affiliation: (1) Suzhou Institute for Advanced Research, University of Science and Technology of China, Jiangsu, Suzhou; 215123, China; (2) Hefei National Laboratory for Physical Sciences at the Microscale, School of Chemistry and Materials Science, University of Science and Technology of China, Anhui, Hefei; 23026, China; (3) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Shaanxi, Xi'an; 710054, China
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Source title: Journal of Materials Chemistry A
Abbreviated source title: J. Mater. Chem. A
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Publication year: 2021
Pages: 5878-5888
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ISSN: 20507488
E-ISSN: 20507496
CODEN: JMCAET
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Photoelectrocatalysis (PEC) has recently emerged as a promising strategy for utilizing solar energy due to its unique features in combining the merits of electrocatalysis and photocatalysis in solar energy harvesting, charge

kinetics and catalytic reactions. However, it still encounters bottlenecks of scarce reaction sites and low product selectivity, restricting its development toward practical applications. Over the past decade, single-atom-based catalysts (SACs) with atomically dispersed metal sites have demonstrated immense potential in many catalytic reactions. In comparison with their nanoparticles (NPs) or bulk counterparts, the SACs normally have enormous surface active sites and trigger unique surface reactions, which, if rationally designed, can open up wide possibilities for PEC. Here, we overview the challenges and opportunities of SACs in PEC. We first summarize the advantages of SACs in enhancing the adsorption of reactants, charge transfer, catalytic selectivity, and catalytic activity. Then we discuss the rational design of single-atom active sites in the photoelectrochemical system. In the end, challenges and perspectives regarding the fundamental research and development of single-atom catalysts in PEC are also proposed. We foresee that this timely perspective can provide some important insights for researchers in this field and accelerate the development of PEC. © 2022 The Royal Society of Chemistry
Number of references: 100
Main heading: Surface reactions
Controlled terms: Catalyst activity - Solar energy - Atoms - Photoelectrochemical cells - Charge transfer - Electrocatalysis - Energy harvesting
Uncontrolled terms: Catalytic reactions - Charge kinetics - Kinetic reactions - Photo-electrocatalysis - Photoelectrocatalysis - Reaction sites - Single-atoms - Solar energy harvesting - Unique features -]+ catalyst
Classification code: 525.5 Energy Conversion Issues - 657.1 Solar Energy and Phenomena - 702.1 Electric Batteries - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 931.3 Atomic and Molecular Physics
DOI: 10.1039/d1ta08252c
Funding Details: Number: 21725102,22005242,51902253,91961106, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: CAS, Sponsor: Chinese Academy of Sciences; Number: 2020JQ-778, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2020YFA0406103, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: This work was financially supported in part by the National Key R&D Program of China (2020YFA0406103), NSFC (21725102, 51902253, 91961106, and 22005242), CAS Hundred Talent Program, and the Shaanxi Provincial Natural Science Foundation (2020JQ-778).
Compendex references: YES
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Database: Compendex
Data Provider: Engineering Village
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9. Recent Advances in Corrosion Research of Biomedical NiTi Shape Memory Alloy

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Title of translation: NiTi
Authors: Liu, Ming (1); Li, Jun (2); Zhang, Yanxiao (3); Xue, Yuna (4)
Author affiliation: (1) Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano), School of Materials Science and Engineering, Xi'an Jiaotong University, Xi'an; 710049, China; (2) School of Materials Science and Engineering, Chang'an University, Xi'an; 710061, China; (3) Department of Orthodontic, Wuxi Hospital of Stomatology, Wuxi; 214000, China; (4) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Ming(liuming0313@xjtu.edu.cn)
Source title: Xiyou Jinshu Cailiao Yu Gongcheng/Rare Metal Materials and Engineering
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Language: Chinese
ISSN: 1002185X
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Document type: Journal article (JA)
Publisher: Science Press
Abstract: Due to good corrosion resistance and mechanical properties, NiTi shape memory alloy (NiTi-SMA) has been widely used in oral and clinical medicine. However, the release of Ni2+ after NiTi-SMA corrosion can trigger cytotoxicity and allergic reactions. Improving the corrosion resistance of NiTi-SMA is one of the key technologies in biomedical materials field. In this paper, the corrosion status of NiTi-SMA commonly used in oral and clinical medicine in recent

years was summarized. At the same time, the additive manufacturing and surface modification of NiTi-SMA technology was also reviewed in order to provide some guidance for the development of high performance anti-corrosion NiTi-SMA. © 2021, Science Press. All right reserved.
Number of references: 68
Main heading: Corrosion resistance
Controlled terms: 3D printers - Corrosion resistant alloys - Medicine - Additives - Titanium alloys - Binary alloys - Biomedical engineering - Shape-memory alloy
Uncontrolled terms: Allergic reactions - Alloy technology - Anti-corrosion - Biomedicine - Clinical medicine - Corrosion research - Key technologies - NiTi shape memory alloys - Performance - Surface-modification
Classification code: 461.1 Biomedical Engineering - 461.6 Medicine and Pharmacology - 531 Metallurgy and Metallography - 539.1 Metals Corrosion - 542.3 Titanium and Alloys - 745.1.1 Printing Equipment - 803 Chemical Agents and Basic Industrial Chemicals
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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10. Reduced Graphene Oxide Nanosheets Decorated with Copper and Silver Nanoparticles for Achieving Superior Strength and Ductility in Titanium Composites (*Open Access*)

Accession number: 20213810912562
Authors: Dong, Longlong (1, 2); Zhang, Wei (1); Fu, Yongqing (3); Lu, Jinwen (1); Liu, Xiaoteng (3); Tian, Ning (4, 5); Zhang, Yusheng (1, 5)
Author affiliation: (1) Advanced Materials Research Central, Northwest Institute for Nonferrous Metal Research, Xi'an; 710016, China; (2) School of Materials Science and Engineering, Northeastern University, Shengyang; 110819, China; (3) Faculty of Engineering and Environment, Northumbria University, Tyne; NE1 8ST, United Kingdom; (4) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (5) Xi'an Rare Metal Materials Institute Co., Ltd., Xi'an; 710016, China
Corresponding author: Zhang, Yusheng(y.sh.zhang@163.com)
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Issue date: 2021
Publication year: 2021
Language: English
ISSN: 19448244
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Document type: Article in Press
Publisher: American Chemical Society
Abstract: Graphene and its derivates are extensively applied to enhance the mechanical properties of metal matrix nanocomposites. However, their high reactivity with a metal matrix such as titanium and thus the limited strengthening effects are major problems for achieving high-performance graphene-based nanocomposites. Herein, reduced graphene oxide nanosheets decorated with copper or silver (i.e., Cu@rGO and Ag@rGO) nanopowders are introduced into Ti matrix composites using multiple processes of one-step chemical coreduction, hydrothermal synthesis, low-energy ball milling, spark plasma sintering, and hot rolling. The Cu@rGO/Ti and Ag@rGO/Ti nanocomposites exhibit significantly enhanced strength with superior elongation to fracture (846 MPa-11.6 and 900 MPa-8.4%, respectively, basically reaching the level of the commercial Ti-6Al-4V titanium alloy), which are much higher than those of the fabricated Ti (670 MPa-7.0%) and rGO/Ti composites (726 MPa-11.3%). Furthermore, fracture toughness values of the M@rGO/Ti composites are all significantly improved, that is, the highest KIC value is 34.4 MPa·m1/2 for 0.5Cu@rGO/Ti composites, which is 20.28 and 51.5% higher than those of monolithic Ti and 0.5rGO/Ti composites, respectively. The outstanding mechanical properties of Ag@rGO/Ti and Cu@rGO/Ti composites are attributed to the effective load transfer of in situ formed TiC nanoparticles and the formation of interfacial intermetallic compounds between the rGO nanosheets and Ti matrix. This study provides new insights and approach for the fabrication of metal-modified graphene/Ti composites with a high performance. © 2021 American Chemical Society.
Number of references: 69
Main heading: Metal nanoparticles
Controlled terms: Copper alloys - Graphene - Ball milling - Hydrothermal synthesis - Aluminum alloys - Silver nanoparticles - Nanosheets - Spark plasma sintering - Ternary alloys - Titanium carbide - Copper - Metallic matrix composites - Titanium alloys - Fracture toughness - Nanocomposites

Uncontrolled terms: Elongation to fracture - Fracture toughness values - Graphene oxide nanosheets - Interfacial intermetallics - Low energy ball millings - Metal matrix nano composites - Strength and ductilities - Ti-6al-4v titanium alloys
Classification code: 531 Metallurgy and Metallography - 541.2 Aluminum Alloys - 542.3 Titanium and Alloys - 544.1 Copper - 544.2 Copper Alloys - 761 Nanotechnology - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 933 Solid State Physics
Numerical data indexing: Percentage 2.03e+01%, Percentage 5.15e+01%
DOI: 10.1021/acsami.1c08899
Funding Details: Number: 201857,202008, Acronym: -, Sponsor: -; Number: 2020JC-50, Acronym: -, Sponsor: -; Number: 2020KJXX-061,IEC/NSFC/201078, Acronym: -, Sponsor: -; Number: -, Acronym: -, Sponsor: Royal Society; Number: 51901192, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019GY-164,2021GY-214,2021SF-296, Acronym: -, Sponsor: Key Research and Development Projects of Shaanxi Province;
Funding text: The authors want to thank Zijun Ren (Xi'an Jiaotong University Instrument Analysis Center). This work was supported by the National Natural Science Foundation of China (no. 51901192), Shaanxi Science Foundation For Distinguished Young Scholars (2020JC-50), Key Research and Development Projects of Shaanxi Province (nos. 2019GY-164, 2021GY-214, and 2021SF-296), Science and Technology Project of Weiyang District of Xi'an City (nos. 201857 and 202008), Shaanxi Youth Star Program of Science and Technology (no. 2020KJXX-061), as well as an International Exchange Grant (IEC/NSFC/201078), through the Royal Society, UK, and the National Natural Science Foundation of China.
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11. Influences on Compaction of Cold Mix Cement Emulsified Asphalt Using the Superpave Gyratory Compaction

Accession number: 20211410158119
Authors: Cao, Xuepeng (1); Zhang, Cuihong (2); Tuo, Shuaihua (1); Fu, Yao (1); Zhi, Tongchao (3); Djime Moussa, Ahmat (1)
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Publication year: 2021
Article number: 04021107
Language: English
ISSN: 08991561
E-ISSN: 19435533
Document type: Journal article (JA)
Publisher: American Society of Civil Engineers (ASCE)
Abstract: It is well known that cold mix cement emulsified asphalt (CMCEA) exhibits good mechanical performance even when paved at room temperature. In this study, the compactibility and mechanical properties of CMCEA specimens were studied using a Superpave gyratory compactor. To analyze CMCEA compaction dynamics, two indices based on indexes of compaction quality (ICQ) and parameters of the compaction process (PCP) were considered. ICQ included the compressive strength and air voids, while PCP included the compaction energy index and compaction rate. Tests were conducted on CMCEA specimens to estimate the effect of process variables, such as compaction temperature, time interval before compaction, and gyration parameters, on ICQ and PCP. It was determined that CMCEA could be molded satisfactorily at temperatures below 40°C. Experimental results showed that the compressive strength and densification of CMCEA specimens were positively correlated in the range of °C10-40°C and negatively correlated beyond 40°C. Process variables play an important role in controlling the compaction characteristics, such as the compressive strength and air voids. Furthermore, choosing a suitable time interval

before compaction (TIBC) at a given compaction temperature helps in saving compaction energy and achieving an appropriate compaction rate. To achieve a CMCEA compressive strength >2.4 MPa and densification >92% at 25°C, as mandated by practical design requirements, the TIBC, number of gyrations, and gyration angle were optimized at 12-35 min, 140-160, and 1.15°, respectively. The method used to determine these parameters and the obtained optimal values serve as a benchmark for actual pavement construction. © 2021 American Society of Civil Engineers.
Number of references: 45
Main heading: Cements
Controlled terms: Compressive strength - Asphalt - Compaction - Emulsification
Uncontrolled terms: Compaction characteristics - Compaction dynamics - Compaction qualities - Compaction temperature - Gyratory compaction - Mechanical performance - Pavement construction - Superpave gyratory compactors
Classification code: 411.1 Asphalt - 412.1 Cement - 802.3 Chemical Operations
Numerical data indexing: Temperature 2.98e+02K, Temperature 3.13e+02K, Time 7.20e+02s to 2.10e+03s
DOI: 10.1061/(ASCE)MT.1943-5533.0003720
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Funding text: This research is supported by Natural Science Foundation of Shaanxi Province (No. 2020JQ-786) and Central Universities Funds of Chang'an University (Nos. 300102250501 and 300102259306), and partially funded the Scientific Planning Project of Henan Provincial Department of Transportation (Nos. 2018J1 and 2019J3).This research is supported by Natural Science Foundation of Shaanxi Province (No.2020JQ-786) and Central Universities Funds of Chang'an University (Nos. 300102250501 and 300102259306), and partially funded the Scientific Planning Project of Henan Provincial Department of Transportation (Nos. 2018J1 and 2019J3).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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12. A numerical investigation of gas flow behavior in two-layered coal seams considering interlayer interference and heterogeneity (*Open Access*)

Accession number: 20212410499178
Authors: Wang, Ziwei (1, 2); Qin, Yong (1, 2); Li, Teng (3); Zhang, Xiaoyang (4)
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Document type: Journal article (JA)
Publisher: China University of Mining and Technology
Abstract: Multiple-seam gas coproduction is a technology with potential to achieve economic targets. Physical experiments could replicate gas flow dynamics in two seams. In this study, numerical simulation was conducted based on physical experiments. Through calibration, the simulated results agreed with the experimental results. Three findings were obtained. First, the pressure distribution intrinsically depends on the depressurization effectiveness in each coal seam. The gas pressure difference and interval distance influence the pressure distribution by inhibiting depressurization in the top seams and bottom seams, respectively. Second, the production contribution shows a logarithmic relationship with the permeability ratio. The range of the production contribution difference grows from 11.24% to 99.99% when the permeability ratio increases 50 times. By comparison, reservoir pressure has a limited influence, with a maximum of 13.64%. Third, the interlayer interference of the top seams and bottom seams can be intensified by the reservoir pressure difference and the interval distance, respectively. The proposed model has been calibrated and verified and can be directly applied to engineering, serving as a reference for reservoir combination

optimization. In summary, coal seams with a permeability ratio within 10, reservoir pressure difference within 1.50 MPa, and interval distances within 50 m are recommended to coproduce together. © 2021
Number of references: 76
Main heading: Pressure distribution
Controlled terms: Coal - Coal deposits - Flow of gases - Petroleum reservoir engineering
Uncontrolled terms: Combination optimization - Gas pressure difference - Interlayer interferences - Logarithmic relationship - Numerical investigations - Permeability ratio - Physical experiments - Reservoir pressures
Classification code: 503 Mines and Mining, Coal - 512.1.2 Petroleum Deposits : Development Operations - 524 Solid Fuels - 631.1.2 Gas Dynamics - 931.1 Mechanics
Numerical data indexing: Percentage 1.12e+01% to 1.00e+02%, Percentage 1.36e+01%, Pressure 1.50e+06Pa, Size 5.00e+01m
DOI: 10.1016/j.ijmst.2021.05.003
Funding Details: Number: 41772155, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: CSC201906420044, Acronym: CSC, Sponsor: China Scholarship Council; Number: 2016ZX05044002-005, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village
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13. Preparation of Ammonium Oleic Acid Salts and Their Evaluation as Shale Swelling Inhibitors in Water-Based Drilling Fluid Herstellung von Ammoniumölsäuresalzen und ihre Bewertung als Schieferquellungsinhibitoren in der wasserbasierten Bohrspülung

Accession number: 20213210744080
Authors: Zhang, Rongjun (1); Bai, Yun (1, 2); Sun, Yan (1); Du, Weichao (3); Pu, Chunsheng (2); Zhang, Jie (4); Chen, Gang (1)
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Corresponding author: Chen, Gang(gangchen@xsyu.edu.cn)
Source title: Tenside, Surfactants, Detergents
Abbreviated source title: Tenside Surfactants Deterg
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Pages: 311-316
Language: English
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CODEN: TSDEES
Document type: Journal article (JA)
Publisher: Walter de Gruyter GmbH
Abstract: In this paper, ammonium oleic acid salts (AOS) were prepared from oleic acid and amines and investigated as low molecular weight shale swelling inhibitors. First, the inhibitory effect of AOS was investigated using the linear expansion test of bentonite. The results show that the inhibitor prepared from oleic acid and tetraethylene pentamine with a molar ratio of 1:2 (AOS-8) has an excellent inhibitory effect on the hydration expansion of bentonite. The inhibitory effect of AOS-8 on bentonite was further investigated in subsequent work steps using various methods, including the linear swelling test of clay and particle distribution measurement. The results show that AOS-8 has superior performance in inhibiting hydration swelling and dispersion of bentonite. With 0.5% AOS-8, the swelling rate was reduced to 37.7%, and the particle size of bentonite in water could be controlled with AOS-8. Finally, the inhibition mechanism of AOS-8 was determined in detail by scanning electron microscopy (SEM) and thermogravimetric analysis

(TGA). In water-based drilling fluid, AOS-8 is compatible with conventional additives. It can also significantly improve the lubricating capacity of the mud cake after ageing at 120°C. © 2021 Walter de Gruyter GmbH, Berlin/Boston 2021.
Number of references: 12
Main heading: Particle size
Controlled terms: Oleic acid - Molar ratio - Bentonite - Particle size analysis - Shale - Swelling - Scanning electron microscopy - Clay minerals - Hydration - Additives - Amines - Drilling fluids - Infill drilling - Thermogravimetric analysis - Salts
Uncontrolled terms: Conventional additives - Hydration swelling - Inhibition mechanisms - Inhibitory effect - Linear expansions - Low molecular weight - Particle distributions - Water based drilling fluids
Classification code: 482.2 Minerals - 511.1 Oil Field Production Operations - 801 Chemistry - 801.4 Physical Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 951 Materials Science
Numerical data indexing: Percentage 3.77e+01%, Percentage 5.00e-01%, Temperature 3.93e+02K
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Funding Details: Number: 21808182,51974245, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2019ZDLGY06-03, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: This work was financially supported by the grants from National Natural Science Foundation of China (21808182, 51974245) and Shaanxi Key Research and Development Program (2019ZDLGY06-03). We are also grateful for the support of the Youth Innovation Team of Shaanxi Universities and for the work of the Modern Analysis and Testing Center of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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14. Mechanical property and main control mechanism of ultra-deep fractured carbonate rocks

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Title of translation:
Authors: Yang, Bin (1, 2); Zhang, Hao (1); Liu, Qiming (3); Ou, Biao (3); Hu, Yongzhang (3); She, Jiping (1); Pan, Guanchang (1, 2)
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Source title: Natural Gas Industry
Abbreviated source title: Natur. Gas Ind.
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Pages: 107-114
Language: Chinese
ISSN: 10000976
CODEN: TIGOE3
Document type: Journal article (JA)
Publisher: Natural Gas Industry Journal Agency
Abstract: Natural fractures developed in ultra-deep marine carbonate reservoirs can aggravate the risks of wellbore instability and circulation loss in the process of drilling and completion. What's more, the influence mechanisms of development degree and microscopic characteristics of natural fractures on the mechanical property of ultra-deep carbonate rocks need further studying. In order to provide experimental basis for improving the anti-collapse and anti-leak and acid fracturing technologies of ultra-deep marine carbonate reservoir, this paper carries out triaxial mechanical experiments by taking the carbonate reservoir of Middle Triassic Leikoupo Formation in the West Sichuan Depression of the Sichuan Basin as an example. Then, based on the results of CT scanning reconstruction, fracture filling analysis, fracture plane scanning image and friction coefficient test, its mechanical properties are studied from the aspects of fracture occurrence, fillings and friction characteristics. And the following research results are obtained. First, natural fractures in the Leikoupo Formation ultra-deep carbonate reservoir of the West Sichuan Depression are mostly filled with high-purity calcite, and the rocks have the characteristics of low Poisson's ratio, low mechanical

strength and strong discretion. Second, the rock samples of Leikoupo Formation generally suffer shear failure from high-angle natural fractures, and the dip angle of failure surfaces is in the range of 46°-80°. The contour of natural fractures is flat, the micro asperities on the fracture surfaces are underdeveloped with low slope, and calcite fillings are of low hardness and weak cementation. Third, fracture occurrence, fillings and friction characteristics weaken the shear failure resistance of rocks and reduces the compression strength overall, and the low friction coefficient of fracture surface is the key cause of weak shear failure resistance. Fourth, the good wettability of water-based drilling fluid to calcite filling layers leads to the further reduction of rock strength, and fractures' control characteristics are more obvious. In conclusion, the research results provide basic guidance more specifically for wellbore instability control and acid fracturing design optimization of ultra-deep fractured carbonate reservoirs. © 2021, Natural Gas Industry Journal Agency. All right reserved.
Number of references: 27
Main heading: Filling
Controlled terms: Carbonation - Drilling fluids - Infill drilling - Mechanisms - Calcite - Oil field equipment - Natural fractures - Friction - Computerized tomography - Boreholes - Sedimentary rocks
Uncontrolled terms: Control characteristics - Drilling and completion - Fractured carbonate reservoirs - Friction characteristics - Low friction coefficients - Microscopic characteristics - Water based drilling fluids - West Sichuan depression
Classification code: 421 Strength of Building Materials; Mechanical Properties - 482.2 Minerals - 511.1 Oil Field Production Operations - 511.2 Oil Field Equipment - 601.3 Mechanisms - 691.2 Materials Handling Methods - 723.5 Computer Applications - 802.2 Chemical Reactions - 804.2 Inorganic Compounds
DOI: 10.3787/j.issn.1000-0976.2021.07.012
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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15. Forming characteristics and mechanism of double-sided heat source synergic vertical welding on an aluminum alloy

Accession number: 20210609894856
Authors: Qiang, Wei (1, 2); Wang, Kehong (2, 3); Wang, Shiqing (1); Lu, Yongxin (1, 4); Gao, Qian (1)
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Source title: Journal of Manufacturing Processes
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Volume: 64
Issue date: April 2021
Publication year: 2021
Pages: 356-368
Language: English
ISSN: 15266125
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Top-quality aluminum alloy weld beads, exploiting the double-sided heat source synergic welding (DSHSSW) process, were obtained with medium heat input, no arc spacing, no root gap, and upward vertical direction. The energy utilization was reduced with the augmented arc spacing because of the attendant increased heat dissipation. Compared with one-side welding (OSW), the fusion area and melting efficiency of DSHSSW were enormously raised, indicating the enhancement of melting performance and energy utilization, and superior joints could be fabricated using DSHSSW under the identical heat input. Additionally, the DSHSSW arc was constricted and thus improved the energy density in contrast to OSW. As the weld penetration deepened during DSHSSW, the heat conduction space was diminished, and the heat accumulation effect was generated. The arc contraction and heat accumulation effect mutually lead to the increased penetrating ability during DSHSSW. © 2021 The Society of Manufacturing Engineers
Number of references: 26
Main heading: Energy utilization
Controlled terms: Heat conduction - Melting - Welding - Aluminum alloys - Welds

Uncontrolled terms: Characteristics and mechanisms - Energy density - Heat accumulation effects - Melting efficiencies - Melting performance - One-side welding - Vertical direction - Weld penetrations
Classification code: 525.3 Energy Utilization - 538.2 Welding - 541.2 Aluminum Alloys - 641.2 Heat Transfer - 802.3 Chemical Operations
DOI: 10.1016/j.jmapro.2021.01.013
Funding Details: Number: CAIAM-202101, Acronym: -, Sponsor: -; Number: 51975469, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JQ5196, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: AWJ-21M21, Acronym: SKLAWJ, Sponsor: State Key Laboratory of Advanced Welding and Joining; Number: 2020JQ-768,2020JQ-770, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was supported by Natural Science Basic Research Program of Shaanxi (No. 2020JQ-768 , 2020JQ-770); Key Laboratory of Controlled Arc Intelligent Additive Manufacturing (No. CAIAM-202101); National Natural Science Foundation of China (No. 51975469); State Key Laboratory of Advanced Welding and Joining (No. AWJ-21M21); Natural Science Foundation of Shaanxi Province of China (No. 2018JQ5196).
Compendex references: YES
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16. A well test analysis model of generalized tube flow and seepage coupling

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Title of translation: -
Authors: Lin, Jia'en (1, 2); He, Hui (2, 3); Wang, Yihua (2, 3)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Petroleum University, Xi'an; 710065, China; (2) MOE Engineering Research Center of Development & Management of Low & Ultra-Low Permeability Oilfields in West China, Xi'an; 710065, China; (3) Xi'an Sinoline Petroleum Science & Technology Co., Ltd, Xi'an; 710065, China
Source title: Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development
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Pages: 797-806
Language: Chinese
ISSN: 10000747
CODEN: SKYKEG
Document type: Journal article (JA)
Publisher: Science Press
Abstract: "Generalized mobility" is used to realize the unification of tube flow and seepage in form and the unification of commonly used linear and nonlinear flow laws in form, which makes it possible to use the same form of motion equations to construct unified governing equations for reservoirs of different scales in different regions. Firstly, by defining the generalized mobility under different flow conditions, the basic equation governing fluid flow in reservoir coupling generalized tube flow and seepage is established. Secondly, two typical well test analysis models for coupling tube flow and seepage flow are given, namely, pipe-shaped composite reservoir model and partially open cylindrical reservoir model. The log-log pressure draw-down type-curve of composite pipe-shaped reservoir model can show characteristics of two sets of linear flow. The log-log pressure drawdown plot of partially opened cylindrical reservoir model can show the characteristics of spherical flow and linear flow, as well as spherical flow and radial flow. The pressure build-up derivative curves of the two models basically coincide with their respective pressure drawdown derivative curves in the early stage, pulling down features in the late stage, and the shorter the production time is, the earlier the pulling down feature appears. Finally, the practicability and reliability of the models presented in this paper are verified by three application examples. © 2021, The Editorial Board of Petroleum Exploration and Development. All right reserved.
Number of references: 36
Main heading: Nonlinear equations
Controlled terms: Equations of motion - Seepage - Multiphase flow - Well testing - Radial flow
Uncontrolled terms: Complex reservoirs - Coupled tube flow and seepage - Generalized mobility - Linear-flow - Nonlinear flow - Pressure drawdowns - Reservoir models - Spherical flow - Test-analysis models - Well-test analysis
Classification code: 631.1 Fluid Flow, General - 921.2 Calculus
DOI: 10.11698/PED.2021.04.12

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17. Recent advances in dopamine-based materials constructed via one-pot co-assembly strategy

Accession number: 20213110717091
Authors: Li, Hong (1); Jiang, Bo (2); Li, Junbai (3, 4)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Department of Neuro-oncology, Beijing Tiantan Hospital, Capital Medical University, Beijing; 100070, China; (3) Beijing National Laboratory for Molecular Sciences, CAS Key Lab of Colloid, Interface and Chemical Thermodynamics, Institute of Chemistry, Chinese Academy of Sciences, Beijing; 100190, China; (4) University of Chinese Academy of Sciences, Beijing; 100049, China
Corresponding authors: Jiang, Bo(jiangboprof@163.com); Li, Junbai(jbli@iccas.ac.cn)
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Article number: 102489
Language: English
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CODEN: ACISB9
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Dopamine-based materials have attracted widespread interest due to the outstanding physicochemical and biological properties. Since the first report on polydopamine (PDA) films, great efforts have been devoted to develop new fabrication strategies for obtaining novel nanostructures and desirable properties. Among them, one-pot co-assembly strategy offers a unique pathway for integrating multiple properties and functions into dopamine-based platform in a single simultaneous co-deposition step. This review focuses on the state of the art development of one-pot multicomponent self-assembly of dopamine-based materials and summarizes various single-step co-deposition approaches, including PDA-assisted adaptive encapsulation, co-assembly of dopamine with other molecules through non-covalent interactions or covalent interactions. Moreover, emerging applications of dopamine-based materials in the fields ranging from sensing, cancer therapy, catalysis, oil/water separation to antifouling are outlined. In addition, some critical remaining challenges and opportunities are discussed to pave the way towards the rational design and applications of dopamine-based materials. © 2021 Elsevier B.V.
Number of references: 170
Main heading: Amines
Controlled terms: Oncology - Deposition - Diseases - Neurophysiology - Physicochemical properties
Uncontrolled terms: Adaptive encapsulation - Biological properties - Covalent interactions - Emerging applications - Fabrication strategies - Non-covalent interaction - Oil/water separation - State of the art
Classification code: 461.6 Medicine and Pharmacology - 801.4 Physical Chemistry - 802.3 Chemical Operations - 804.1 Organic Compounds
DOI: 10.1016/j.cis.2021.102489
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18. High-performance La0.5(Ba0.75Ca0.25)0.5Co0.8Fe0.2O3-δ cathode for proton-conducting solid oxide fuel cells

Accession number: 20200408071410
Authors: Xie, Dong (1); Li, Kai (2); Yang, Jun (3); Yan, Dong (1); Jia, Lichao (1); Chi, Bo (1); Pu, Jian (1); Li, Jian (1)
Author affiliation: (1) Center for Fuel Cell Innovation, School of Materials Science and Engineering, State Key Laboratory of Material Processing and Die & Mould Technology, Huazhong University of Science and Technology, Wuhan; 430074, China; (2) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences. Ningbo, 315201, China
Corresponding author: Jia, Lichao(jialc@hust.edu.cn)
Source title: International Journal of Hydrogen Energy
Abbreviated source title: Int J Hydrogen Energy
Volume: 46
Issue: 15
Issue date: February 26, 2021
Publication year: 2021
Pages: 10007-10014
Language: English
ISSN: 03603199
CODEN: IJHEDX
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: La0.5(Ba0.75Ca0.25)0.5Co0.8Fe0.2O3-δ, a simple perovskite cathode material with high electrical conductivity (940 S cm-1 at 600 °C) and impressive surface catalytic activity, was prepared and used in proton-conducting solid oxide fuel cells. As its thermal expansion coefficient is higher than that of the electrolyte material BaZr0.1Ce0.7Y0.1Yb0.1O3-δ, they were combined and used as a composite cathode. The crystal structure, chemical compatibility, electrical conductivity, cell performance, and the oxygen reduction reaction of the cathode material were explored, and we found that the single fuel cell developed with the composite cathode achieved excellent electrochemical performance, with both a low polarization resistance and high peak power density (0.044 Ω cm2 and 1102 mW cm-2 at 750 °C, respectively). Outstanding stability was also achieved, as indicated by a long-term 100-h test. Additionally, the rate-limiting steps of the oxygen reduction reaction were the oxygen adsorption, dissociation, and diffusion processes. © 2020 Hydrogen Energy Publications LLC
Number of references: 60
Main heading: Cathodes
Controlled terms: Oxygen - Thermal expansion - Electric conductivity - Gas adsorption - Catalyst activity - Electrolytes - Electrolytic reduction - Crystal structure - Perovskite - Solid oxide fuel cells (SOFC)
Uncontrolled terms: Electrical conductivity - Electrochemical performance - High electrical conductivity - Long term stability - Polarization resistances - Proton-conducting solid oxide fuel cells - Surface catalytic activity - Thermal expansion coefficients
Classification code: 482.2 Minerals - 533.1 Ore Treatment - 641.1 Thermodynamics - 701.1 Electricity: Basic Concepts and Phenomena - 702 Electric Batteries and Fuel Cells - 702.2 Fuel Cells - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 933.1.1 Crystal Lattice - 951 Materials Science
Numerical data indexing: Temperature 1.02e+03K, Temperature 8.73e+02K, Time 3.60e+05s
DOI: 10.1016/j.ijhydene.2020.01.014
Funding Details: Number: 51702258,51872103,U1601207, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China; Number: 2016YFE0126900,2017YFE0129300, Acronym: -, Sponsor: National Key Research and Development Program of China Stem Cell and Translational Research; Number: 2018AAA057, Acronym: -, Sponsor: Major Technology Innovation of Hubei Province;
Funding text: This work was supported by the National Natural Science Foundation of China [grant numbers 51872103 , U1601207 , 51702258]; the National Key Research & Development Program [grant numbers 2016YFE0126900 , 2017YFE0129300]; and Hubei Province [grant number 2018AAA057]. Assistance in the SEM, XPS, and XRD characterizations was provided by the Analytical and Testing Center of Huazhong University of Science and Technology.This work was supported by the National Natural Science Foundation of China [grant numbers 51872103, U1601207, 51702258]; the National Key Research & Development Program [grant numbers 2016YFE0126900, 2017YFE0129300]; and Hubei Province [grant number 2018AAA057]. Assistance in the SEM, XPS, and XRD characterizations was provided by the Analytical and Testing Center of Huazhong University of Science and Technology.
Compendex references: YES
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19. Ultrastable Cu Catalyst for CO2 Electroreduction to Multicarbon Liquid Fuels by Tuning C–C Coupling with CuTi Subsurface

Accession number: 20214511135908
Authors: Hu, Fei (1); Yang, Li (2); Jiang, Yawen (2); Duan, Chongxiong (1); Wang, Xiaonong (2); Zeng, Longjiao (1); Lv, Xuefeng (1); Duan, Delong (2); Liu, Qi (3); Kong, Tingting (3); Jiang, Jun (2); Long, Ran (2); Xiong, Yujie (2)
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Corresponding authors: Hu, Fei(mfhufei@fosu.edu.cn); Jiang, Jun(jiangj1@ustc.edu.cn); Xiong, Yujie(yjxiong@ustc.edu.cn); Kong, Tingting(ttkong@xsyu.edu.cn)
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Abbreviated source title: Angew. Chem. Int. Ed.
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Publication year: 2021
Pages: 26122-26127
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CODEN: ACIEF5
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: Production of multicarbon (C2+) liquid fuels is a challenging task for electrocatalytic CO2 reduction, mainly limited by the stabilization of reaction intermediates and their subsequent C-C couplings. In this work, we report a unique catalyst, the coordinatively unsaturated Cu sites on amorphous CuTi alloy (a-CuTi@Cu) toward electrocatalytic CO2 reduction to multicarbon (C2-4) liquid fuels. Remarkably, the electrocatalyst yields ethanol, acetone, and n-butanol as major products with a total C2-4 faradaic efficiency of about 49 % at -0.8 V vs. reversible hydrogen electrode (RHE), which can be maintained for at least 3 months. Theoretical simulations and in situ characterization reveals that subsurface Ti atoms can increase the electron density of surface Cu sites and enhance the adsorption of *CO intermediate, which in turn reduces the energy barriers required for *CO dimerization and trimerization. © 2021 Wiley-VCH GmbH
Number of references: 57
Main heading: Electrocatalysis
Controlled terms: Carrier concentration - Acetone - Carbon dioxide - Reaction intermediates - Copper alloys - Electrocatalysts - Electron density measurement - Binary alloys - Liquid fuels - Liquids - Electrolytic reduction - Amorphous carbon
Uncontrolled terms: C-C coupling - CO 2 reduction - Cu catalyst - Cu catalysts - Cu-catalysts - Electro reduction - Electrocatalytic - Electron density - Multicarbon product -]+ catalyst
Classification code: 523 Liquid Fuels - 533.1 Ore Treatment - 544.2 Copper Alloys - 701.1 Electricity: Basic Concepts and Phenomena - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 933.2 Amorphous Solids
Numerical data indexing: Age 2.499E-01yr, Percentage 4.90E+01%, Voltage 8.00E-01V
DOI: 10.1002/anie.202110303
Funding Details: Number: 2019A1515011788, Acronym: -, Sponsor: -; Number: 2020ZDZX2050, Acronym: -, Sponsor: -; Number: 21725102,21802103,22078059,51902253,91961106, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: TJU, Sponsor: Tianjin University; Number: 2020JQ#778, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2020YFA0406103, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: This work was financially supported in part by National Key R&D Program of China (2020YFA0406103), and NSFC (21725102, 51902253, 22078059, 21802103, 91961106). NSF of Guangdong Province of China (2019A1515011788), Project of Educational Commission of Guangdong Province of China (2020ZDZX2050), and Shaanxi Provincial Natural Science Foundation (2020JQ778). We thank Prof. Zhenmeng Peng at Akron University and Prof. Shengli Zhu at Tianjin University for helpful discussion.This work was financially supported in part by National Key

R&D Program of China (2020YFA0406103), and NSFC (21725102, 51902253, 22078059, 21802103, 91961106). NSF of Guangdong Province of China (2019A1515011788), Project of Educational Commission of Guangdong Province of China (2020ZDZX2050), and Shaanxi Provincial Natural Science Foundation (2020JQ-778). We thank Prof. Zhenmeng Peng at Akron University and Prof. Shengli Zhu at Tianjin University for helpful discussion.
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20. Microstructure and tribological properties of titanium matrix nanocomposites through powder metallurgy using graphene oxide nanosheets enhanced copper powders and spark plasma sintering (*Open Access*)

Accession number: 20210709924471
Authors: Tian, N. (1); Dong, L.L. (2, 3); Wang, H.L. (1); Fu, Y.Q. (4); Huo, W.T. (2); Liu, Y. (2); Yu, J.S. (3); Zhang, Y.S. (5)
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Abstract: Titanium alloys have been applied for many lightweight structural components in the fields of aerospace, automobiles and biomedical implants owing to their light-weight, good mechanical properties and biocompatibility. However, poor tribological performance often restricts their wide-range applications. In this study, we synthesized Cu modified Ti-6Al-4 V (TC4) powders with various Cu contents (0, 1, 3, 5, 10 wt%), which was further strengthened with 0.3 wt% graphene oxide nanosheets (GONs) using a powder metallurgy technology. These composite powders were then synthesized into titanium matrix composites using spark plasma sintering. Effects of Cu contents on microstructure evolution, phase composition and tribological properties of Ti matrix composites were systematically investigated. The synthesized composites were consisted of α–Ti, β–Ti, Ti2Cu, in-situ-formed TiC and remained GONs, and showed better tribological properties than those of TC4 alloy. The average coefficient of friction was reduced from 0.168 to a minimum value of 0.120 as the copper content increased from 0 to 3 wt%, meanwhile the wear volume loss was reduced by 49.3%. Whereas further increasing Cu contents resulted in the increases of both coefficients of friction and wear volume loss. These improvements are mainly attributed to the hardness strengthening effects by Ti-Cu intermetallics and TiC@GONs structure, as well as the self-lubricating effect of GONs. Compared with traditional surface modification processes, the new method proposed in this work is cost-effective and promising for improving the tribological performance of titanium alloys in industry applications. © 2021 Elsevier B.V.
Number of references: 41
Main heading: Microstructure
Controlled terms: Titanium carbide - Binary alloys - Powder metallurgy - Spark plasma sintering - Titanium alloys - Aluminum alloys - Biocompatibility - Graphene - Nanosheets - Copper alloys - Cost effectiveness - Friction - Tribology - Wear of materials
Uncontrolled terms: Coefficient of frictions - Coefficients of friction - Graphene oxide nanosheets - Micro-structure evolutions - Powder metallurgy technologies - Surface modification process - Titanium matrix composites - Tribological performance
Classification code: 461.9.1 Immunology - 541.2 Aluminum Alloys - 542.3 Titanium and Alloys - 544.2 Copper Alloys - 761 Nanotechnology - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 911.2 Industrial Economics - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 933 Solid State Physics - 951 Materials Science

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21. A novel conductive composite membrane with polypyrrole (PPy) and stainless-steel mesh: Fabrication, performance, and anti-fouling mechanism

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Authors: Zhang, Yaozhong (1); Wang, Tao (1); Meng, Junjie (2); Lei, Jiang (2); Zheng, Xing (1); Wang, Yifan (1); Zhang, Jie (3); Cao, Xin (1); Li, Xiaoliang (1); Qiu, Xiaopeng (1); Xue, Jinkai (4)
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Publisher: Elsevier B.V.
Abstract: To achieve chemical free cleaning of fouled membrane, a novel electronic-conductive composite membrane was prepared by electrochemical polymerizing polypyrrole (PPy) onto stainless-steel mesh (SSM) in the present study. The permeability of the fabricated conductive membrane can be tuned by adjusting the cycles of electrochemical cyclic voltammetry to a desired permeability level. The membrane has a significantly higher conductivity superior SSM. The anti-fouling performance was tested by using the membrane as the cathode under 2 V during backwash. The results show that under the power-on mode during backwash, the fouling formed during filtering sodium alginate (SA), bovine serum albumin (BSA), humic acid (HA) solution, and secondary effluent can be significantly more reversible than otherwise. According to size exclusion chromatography analysis, large molecular fraction in SA and small organic fractions in HA can be more effectively removed than under normal backwash. Anti-fouling mechanisms unveiled based on atomic force microscopy and Fourier transform infrared spectroscopy analysis suggest that the change of the dipole moment of PPy under applied voltage led to the increase of the electronegativity and hydrophilicity of the membrane surface, which improved hydraulic reversibility of membrane fouling. The fabrication method developed in the present study demonstrates a promising process preparing conductive membranes orientating chemical free cleaning. © 2020
Number of references: 57
Main heading: Fourier transform infrared spectroscopy
Controlled terms: Sodium alginate - Polypyrroles - Chemical bonds - Membrane fouling - Composite membranes - Hydrophilicity - Fabrication - Effluents - Electronegativity - Size exclusion chromatography

Uncontrolled terms: Bovine serum albumins - Conductive composites - Conductive membranes - Fabrication method - Molecular fractions - Permeability levels - Secondary effluent - Stainless steel mesh
Classification code: 452.3 Industrial Wastes - 539.1 Metals Corrosion - 801 Chemistry - 801.4 Physical Chemistry - 801.4.1 Electrochemistry - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 951 Materials Science
Numerical data indexing: Voltage 2.00e+00V
DOI: 10.1016/j.memsci.2020.118937
Funding Details: Number: 18JK0581, Acronym: -, Sponsor: -; Number: 51878555, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JQ5114, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2018KFKT-9, Acronym: XUT, Sponsor: Xi'an University of Technology; Number: -, Acronym: -, Sponsor: Youth Innovation Team Project for Talent Introduction and Cultivation in Universities of Shandong Province;
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22. Stress corrosion cracking behavior and mechanism of super 13Cr stainless steel in simulated O2/CO2 containing 3.5 wt% NaCl solution

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Authors: Luo, Sheji (1); Fu, Anqing (2); Liu, Ming (3); Xue, Yuna (1); Lv, Naixin (2); Han, Yan (2)
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Publisher: Elsevier Ltd
Abstract: Good CO2 corrosion resistance has made super 13Cr martensitic stainless steel become widely used in oil industry. However, the corrosion of OCTG (Oil CountryTubular Goods) changes from pure CO2 to O2/CO2/Cl- and other multi-component containing complex environment. To clarify the stress corrosion cracking (SCC) behavior and fracture mechanism of the super 13Cr stainless steel in the corrosive environment containing O2, CO2 and Cl-, the effect of applied potential on the SCC susceptibility of super 13Cr stainless steel in a 10% O2 and 90% CO2 containing 3.5 wt% NaCl solution was investigated by means of potentiodynamic polarization, slow strain rate tensile (SSRT) test and combined with scanning electron microscopy (SEM). The results show that the polarization potential has an influence on the SCC susceptibility of super 13Cr stainless steel in O2/CO2/Cl- containing medium. The SCC susceptibility is high with the anode and cathode polarization applied, and increases with the rise of the absolute potential values. The SCC mechanism has the following relationships with the applied potentials: a) anodic dissolution happens at 50 mV and 250 mV, b) anodic dissolution and hydrogen embrittlement were observed at -300 mV, and c) hydrogen embrittlement was obtained at -800 mV and -1000 mV. © 2021 Elsevier Ltd
Number of references: 41
Main heading: Carbon dioxide

Controlled terms: Corrosion resistance - Polarization - Steel corrosion - Dissolution - Hydrogen - Residual stresses - Sodium chloride - Scanning electron microscopy - Cracks - Electrodes - Strain rate - Hydrogen embrittlement - Chromium alloys - Chromium steel - Stress corrosion cracking
Uncontrolled terms: 3.5 wt% NaCl solution - Anodic dissolution - Applied potentials - CO 2 corrosion - Corrosion mechanisms - Cracking behavior - Cracking mechanisms - O2/CO2 containing environment - Stress corrosion cracking susceptibility - Super 13cr stainless steel
Classification code: 531.1 Metallurgy - 539.1 Metals Corrosion - 543.1 Chromium and Alloys - 545.3 Steel - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 1.00E+01%, Percentage 2.00E+00%, Percentage 9.00E+01%, Voltage 1.00E00V, Voltage 2.50E-01V, Voltage 3.00E-01V, Voltage 5.00E-02V, Voltage 8.00E-01V
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Database: Compendex
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23. Effects of reaction conditions on one-step synthesis of methylal via methanol oxidation catalyzed by Mo:Fe(2)/HZSM-5 catalyst (*Open Access*)

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Authors: Tian, Yuanyu (1, 3, 4); Yuan, Meng (1, 4); Li, Shen (1, 4); Tang, Ruiyuan (2); Zong, Peijie (1, 4); Qiao, Yingyun (1, 4)
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Publisher: John Wiley and Sons Ltd
Abstract: In the process of one-step synthesis of methylal via methanol oxidation, the design and research of various dual-function catalysts are important and studies on the influence of reaction conditions on this type of process are scarce. We explored the influence of reaction temperature, reaction space velocity, and the feed ratio of methanol to air on the catalytic effect of the process based on the Fe-Mo-based bifunction catalyst and discovered the most appropriate reaction conditions for the process. Results showed that excessively high reaction temperatures were not conducive to the formation of target product Dimethoxymethane (DMM) and this was verified from the perspective of thermodynamic analysis. At the same time, through Brunaure Emmett Teller (BET), X-ray diffraction, scanning electron microscope, NH3-temperature-programmed chemisorption, and Pyridine Fourier Infrared (PY-FTIR) characterization, analysis of the microstructure and surface characteristics of the catalyst showed that an excessively high reaction

temperature caused accumulation of metal oxides on the catalyst surface to block pores and reduce the specific surface area. This also destroyed the active acidic sites on the catalyst surface and weakened the acidity of the catalyst, thereby reducing catalytic activity. Investigation showed that excessively high reaction space velocity caused most of the formaldehyde obtained by catalyzing the initial oxidative dehydrogenation to fail to undergo polycondensation with methanol after desorption in time to obtain DMM, leading to a significant decrease in DMM selectivity. Investigation of the methanol-air feed ratio showed that when CH3OH:air = 1.5, the methylal selectivity was highest and catalytic activity had improved. Orthogonal experiments showed that optimal reaction conditions of the process were 663 K, 15 000 h-1 and CH3OH: air = 0.82. In addition, compared with other bifunctional catalysts of this process, the self-made Mo:Fe(2)/HZSM-5 bifunctional catalyst exhibited high stability and carbon deposition resistance under severe operating conditions. © 2021 John Wiley & Sons Ltd
Number of references: 48
Main heading: Methanol
Controlled terms: Thermoanalysis - Ammonia - Air - Dehydrogenation - Fourier transform infrared spectroscopy - Scanning electron microscopy - Catalyst activity
Uncontrolled terms: Bi-functional catalysts - High reaction temperatures - Optimal reaction condition - Orthogonal experiment - Oxidative dehydrogenations - Surface characteristics - Temperature programmed - Thermo dynamic analysis
Classification code: 801 Chemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Temperature 6.63e+02K
DOI: 10.1002/er.6330
Funding Details: Number: YCX2020040, Acronym: CUPB, Sponsor: China University of Petroleum, Beijing; Number: ZR2017QEE006, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province; Number: SKLOP201901001, Acronym: -, Sponsor: State Key Laboratory of Heavy Oil Processing; Number: 18CX02121A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This study was conducted with National Natural Science Foundation of China (No. 21878335, 21576293 and 21576294), the Fundamental Research Funds for the Central Universities (18CX02121A), the Supported by State Key Laboratory of Heavy Oil Processing (SKLOP201901001), the Postgraduate Innovation Funding Project of China University of Petroleum (East China) (YCX2020040) and the Shandong Natural Science Foundation (ZR2017QEE006).
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24. Perspective on Industrial Applications and Research Progress of High-Entropy Alloys

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Title of translation:
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Publisher: Science Press
Abstract: High-entropy alloys, which usually consist of 5 or more elements in equiatomic or near equiatomic ratio with a solid solution structures, have emerged as a new kind of metallic materials in recent decades. The proposed philosophy of high-entropy alloys has broken the paradigm of traditional alloy design and largely expanded the scope

of alloy exploration. Meanwhile, high-entropy alloys exhibit several unique properties, such as high strength and hardness, unusual low-temperature toughness, high corrosion resistance and radiation resistance, due to the large lattice distortion, high mixing entropy, slow diffusion of atoms and cocktail effects. In this research, we made a brief summary of the present research on high-entropy alloys, and discussed the potential applications of high-entropy alloys in extreme environments as new-emerged structural materials. In particular, the possibility of high-entropy alloys used in the key components of petroleum industries, e.g. drill pipe joint belt, bushing and high-performance riser, was analyzed. © 2021, Science Press. All right reserved.
Number of references: 76
Main heading: Corrosion resistance
Controlled terms: Petroleum prospecting - Petroleum industry - High strength alloys - Corrosion resistant alloys - Radiation effects - Temperature - Entropy
Uncontrolled terms: Extreme environment - Lattice distortions - Low temperature toughness - Metallic material - Mixing entropy - Radiation resistance - Slow diffusion - Solid solution structures
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 531 Metallurgy and Metallography - 531.1 Metallurgy - 539.1 Metals Corrosion - 641.1 Thermodynamics
Compendex references: YES
Database: Compendex
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25. Titanocene Lewis Acid Complexes with Diversified N,O-Ligands: Selectivity toward Three-Component Friedel-Crafts Reactions of Indoles

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Authors: Wu, Ya (1, 2); Lin, Zhiwei (1); Fang, Rongmiao (1); Guo, Yingying (2); Tu, Li (2); Yan, Yikun (2); Zhang, Weiqiang (2); Sun, Huaming (2); Gao, Ziwei (2, 3)
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Abstract: Titanocene complexes by N,O-ligands were rationally designed and tuned for selective three-component aza-Friedel-Crafts reactions of indoles, aldehydes, and unmodified aniline. The combination of Cp2TiCl2 and 8-hydroxyquinoline favored the synthesis of the mono aza-Friedel-Crafts adducts, whereas Cp2TiCl2 combined with anthranilic acid overwhelmingly formed bis-indoles. 1H NMR titration experiments, mass spectroscopy, X-ray crystal structure analyses, and control experiments showed that the reaction of Cp2TiCl2 with 8-hydroxyquinoline resulted in a half-sandwich complex [CpTiCl(C9H6NO)2] (I), in which the Lewis acidity was enhanced via fine-tuning steric and electronic properties of the Ti (IV) center, facilitating mono aza-Friedel-Crafts reaction of indoles, aldehydes, and aniline; in contrast, when anthranilic acid reacted with the same Ti(IV) precursor, a bis-ligand sandwich complex Cp2Ti[(o-NH2)PhCOO]2 (II) was obtained, in which both Lewis acidity of titanium and cooperation with amino groups promoted further transformation of indoles into bis-indole adducts. © 2022 American Chemical Society.
Number of references: 41
Main heading: Mass spectrometry
Controlled terms: Aniline - Aldehydes - Ligands - Titanium compounds - Crystal structure - Titration - Electronic properties
Uncontrolled terms: 8-Hydroxyquinoline - Anthranilic acid - Bis-indoles - Friedel-Craft reactions - Lewis acid complex - Lewis acidity - O ligands - Three-component - Titanocene complexes - Titanocenes
Classification code: 801 Chemistry - 801.4 Physical Chemistry - 804.1 Organic Compounds - 933.1.1 Crystal Lattice
Numerical data indexing: Inductance 1.00E00H

DOI: 10.1021/acs.organomet.1c00711
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26. Exploring the role of heterotrophs in partial nitritation-anammox process treating thermal hydrolysis process - anaerobic digestion reject water

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Authors: Wang, Sike (1, 2); Yu, Heng (2, 5); Su, Qingxian (4); Zuo, Jiane (2, 3)
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Publisher: Elsevier Ltd
Abstract: Heterotrophic bacteria (HB) are generally prevalent in anammox-based processes, but their functional and ecological roles in partial nitritation-anammox (PN/A) process treating high-organics wastewater remained unclear. This study aimed to elucidate HB activities and microbial interactions in a one-stage PN/A treating thermal hydrolysis process (THP) - anaerobic digestion (AD) reject water. The PN/A reactor achieved a satisfactory nitrogen removal rate of 0.58 ± 0.06 g N/(L·d), and around 12% of COD in the THP-AD reject water was removed. N2O emission factors of the PN/A reactor were 1.15% ± 0.18% treating synthetic wastewater, and 0.95% ± 0.06% treating reject water. A balanced symbiotic relationship was maintained between HB and functional groups (i.e., anammox bacteria and aerobic-ammonia-oxidizing bacteria) over the reactor operation. The relative abundances of Anaerolineae spp. clearly increased, while Denitratisoma, capable of denitrification, slightly decreased when treating THP-AD reject water. The preference for electron donors of heterotrophs explained discrepant growth trends. © 2021
Number of references: 50
Main heading: Hydrolysis
Controlled terms: Nitrogen oxides - Nitrogen removal - Anaerobic digestion - Aerobic bacteria - Ammonia - Wastewater treatment
Uncontrolled terms: Anaerobics - ANAMMOX - Heterotrophic bacterias - Heterotrophs - Microbial communities - Nitrous oxide - Partial nitritation - Reject waters - Thermal hydrolysis process - Thermal hydrolysis process-anerobic digestion reject water
Classification code: 452.4 Industrial Wastes Treatment and Disposal - 461 Bioengineering and Biology - 802.2 Chemical Reactions - 804.2 Inorganic Compounds
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27. Controllable ionic self-assembl of polyoxometalate and melamine for synthesis of nanostructured Ag

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Authors: Li, Hong (1); Xiong, Zhuzhu (1); Shi, Xiaodan (1); Gao, Fan (1); Peng, Haonan (2); Jia, Yi (3)
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Abstract: Keggin-type phosphotungstic acid and triazine melamine spontaneously self-assemble into hybrid nanostructures in aqueous media, which can act as an excellent template for the synthesis of nanostructured silver. The difference in initial conditions, such as the concentration, the ratio of the two components, and the temperature, exerts significant influence on the sizes and shapes of the hybrid nanostructures. By virtue of the UV-switchable photoreduction property, these hybrid nanostructures could be used as the template for in situ loading of Ag nanoparticles. The complexation crystalline of phosphotungstic acid and melamine is photochemically reduced, and transfers the electrons to the entrapped Ag ions to form Ag nanoparticles on the colloidal templates. This strategy is simple, convenient, and highly efficient for the construction of organic-inorganic hybrid materials, making them promising for optoelectronic application. © 2021 Elsevier B.V.
Number of references: 29
Main heading: Self assembly
Controlled terms: Oxides - Silver nanoparticles - Sols - Synthesis (chemical) - Metal nanoparticles - organic-inorganic materials
Uncontrolled terms: Ag$++$ - Aqueous media - Hybrid nanostructures - Keggin-type - Nano-structured silvers - Nanostructured Ag - Phosphotungstic acid - Polyoxometalates - Self-assembl - Self-assemble
Classification code: 761 Nanotechnology - 802.2 Chemical Reactions - 804 Chemical Products Generally - 951 Materials Science
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28. Effects of swelling-clay and surface roughness on the wettability of transitional shale

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Corresponding author: Zhang, Jinchuan(Zhangjc@cugb.edu.cn)
Source title: Journal of Petroleum Science and Engineering
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Language: English
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Publisher: Elsevier B.V., Netherlands
Abstract: Wettability in unconventional reservoirs is poorly understood. However, it plays a fundamental role in fluid-rock interactions, and an understanding of wetting behavior is essential for capillary seal assessments and hydrocarbon reserve estimation and recovery in clay-rich reservoirs. In this study, the wetting behavior of transitional Shanxi-Taiyuan shale from the southern North China basin was examined via the contact angle (CA) and spontaneous imbibition (SI) measurement methods. Under water-air-shale conditions, water-wet and neutral-wet behaviors were observed, whereas neutral-wet and oil-wet behaviors were observed under water-oil-shale conditions (Young's equation was used to convert the water-air-shale system to the water-oil-shale system). When the CA method was used, the shale was shown to be hydrophobic, whereas when the SI test was used, the shale was observed to be hydrophilic. The water-air CAs are negatively correlated with the total organic content (TOC), carbonate and clay mineral contents (excluding those of illite). Furthermore, iron-containing compounds, such as pyrite and siderite, were shown to decrease the water wetness. A linear negative correlation was found between the surface roughness and the CA value. The relationship between these parameters can be used to predict the CAs at different surface roughness values for a given sample. The contradictory wetting behaviors between the results of SI and CA methods can be explained by: (i) differences between the CAs formed under water-air-shale conditions and those formed under hydrocarbon-brine-shale conditions; (ii) differences in the surface roughness, which is dependent on the texture and mineralogy of the shale sample; and (iii) clay swelling after water sorption and the formation of microfractures due to water–rock interactions. © 2020
Number of references: 96
Main heading: Wetting
Controlled terms: Textures - Contact angle - Hydrocarbons - Oil shale - Surface roughness - Pyrites
Uncontrolled terms: Fluid-rock interaction - Hydrocarbon reserves - Iron-containing compounds - Measurement methods - Negative correlation - Spontaneous imbibition - Total organic contents - Unconventional reservoirs
Classification code: 512.1 Petroleum Deposits - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1016/j.petrol.2020.108007
Funding Details: Number: 151100311000, Acronym: -, Sponsor: -; Number: -, Acronym: -, Sponsor: Olympus; Number: 41927801,41972132, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 201906400058, Acronym: CSC, Sponsor: China Scholarship Council; Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: 2019JQ–367,PLC2020015, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2016ZX05034002–001, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This work was jointly supported by the National Natural Science Foundation of China (Grant No. 41927801 and 41972132), National Science and Technology Major Project (Grant No. 2016ZX05034002–001); the Research on Exploration and Demonstration of Shale Gas in Henan Province (Grant No. 151100311000); the Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2019JQ–367), Open Fund (Grant No. PLC2020015) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology), and the China Scholarship Council (File No.201906400058). Also, we would like to sincerely thank the Olympus Corporation for the equipment and technical support.This work was jointly supported by the National Natural Science Foundation of China (Grant No. 41927801 and 41972132), National Science and Technology Major Project (Grant No. 2016ZX05034002–001); the Research on Exploration and Demonstration of Shale Gas in Henan

Province (Grant No. 151100311000); the Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2019JQ–367), Open Fund (Grant No. PLC2020015) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology), and the China Scholarship Council (File No. 201906400058). Also, we would like to sincerely thank the Olympus Corporation for the equipment and technical support.
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29. Study of a low-damage efficient-imbibition fracturing fluid without flowback used for low-pressure tight reservoirs

Accession number: 20210609882622
Authors: Huang, Feifei (1); Pu, Chunsheng (1); Gu, Xiaoyu (2); Ye, Zhengqin (3); Khan, Nasir (4); An, Jie (5); Wu, Feipeng (1); Liu, Jing (1)
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Volume: 222
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Publication year: 2021
Article number: 119941
Language: English
ISSN: 03605442
CODEN: ENEYDS
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The oil production from the low-pressure tight reservoirs in China decreases sharply after fracturing under natural depletion. To supply the formation energy and displace oil through imbibition instead of flowback, a novel nanoparticle-enhanced supramolecular fracturing fluid (NESF) was developed. It consisted of 0.10 wt% hydrophobically modified hydroxypropyl guar (HMHPG), 1.00 wt% synthesized hydrophilic gemini surfactant (HGS), and 0.05 wt% hydrophobically fumed nanosilica (HNS). A series of experiments were conducted to characterize the molecular structure of HGS and evaluate the heat/shear resistance, rheological property, proppant suspension and transportation, formation damage, and imbibition efficiency of NESF. Finally, the oilfield practical application of NESF fracturing without flowback was carried out. The results showed that the heat resistance and the interfacial property of NESF were improved by HNS and HGS respectively. Besides the favorable common properties, a low oil permeability loss rate of 9.40%, a high fracture conductivity retainment rate of 95.11%, and a high imbibition recovery factor of 19.43% were realized by NESF. The accumulative oil production of the well stimulated by NESF without flowback was increased by 13.55% and the decline rate of oil production was reduced from 14.70% to 5.22% in the first 6 months. © 2021 Elsevier Ltd
Number of references: 60
Main heading: Nanoparticles
Controlled terms: Surface active agents - Specific heat - Petroleum reservoir engineering - Oil fields - Mercury compounds - Fracturing fluids
Uncontrolled terms: Formation energies - Fracture conductivities - Hydroxypropyl guars - Imbibition efficiencies - Interfacial property - Permeability loss - Proppant suspension - Rheological property
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 641.1 Thermodynamics - 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 933 Solid State Physics
Numerical data indexing: Age 5.00e-01yr, Percentage 1.36e+01%, Percentage 1.47e+01% to 5.22e+00%, Percentage 1.94e+01%, Percentage 9.40e+00%, Percentage 9.51e+01%
DOI: 10.1016/j.energy.2021.119941
Funding Details: Number: 51874339,51904320, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 17CX05004,18CX02095A, Acronym: -, Sponsor: Fundamental Research Funds for the Central

Universities; Number: 2020JQ-775,2020JQ-787, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was supported by the Natural Science Foundation of China [grant numbers 51874339 , 51904320]; the Fundamental Research Funds for the Central Universities [grant number 17CX05004 , 18CX02095A]; and the Natural Science Basic Research Plan in Shaanxi Province of China [grant number 2020JQ-787 , 2020JQ-775]. The authors also appreciate the linguistic assistance from Dr. Jingyang Pu and Dr. Sanbao Dong during the revision of this paper.
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30. Study on long-term rheological characteristics of polymer gel and prediction of its creep fracture time

Accession number: 20210609890530
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Corresponding author: Yu, Weichu(yuweichu@126.com)
Source title: Journal of Petroleum Science and Engineering
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Publication year: 2021
Article number: 108445
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Conformance control by using the polymer gel is an important stimulation technique of heterogeneous oil reservoirs. After operation of the conformance control, the water channeling of heterogeneous oil reservoirs can be plugged, which can force the follow-up injected water to divert into the area with high oil saturation. Thus, under the action of water injection pressure, the polymer gel is deformed. Because this is a long-term process, the ability to resist the long-term deformation and resist damage of polymer gel is important for the long-term plugging effect. However, there are few reports on the effect of long-term rheological characteristics of the polymer gel on its plugging ability. Therefore, it is of great significance to study the rheological characteristics of the polymer gel under the long-term action of a stress, which can be used to accurately predict the effective period of plugging the water channeling. In this paper, taking the Hook body and the viscous pot as the basic elements, and considering the Maxwell model and the Kelvin model as the basic models, a combined viscoelastic mechanical model of the polymer gel is established, which can be used to simulate the creep deformation of polymer gel. At the rheological damage stage of the polymer gel, the strain is increased exponentially and the mechanical parameters is decayed exponentially with time. By introducing the damage variable, based on the stress - time equivalence principle of polymer materials, the time of creep fracture of the polymer gel can be accurately calculated. Since then, the polymer gel is started to break obviously and lost its ability for plugging. This study can provide an important guidance to optimizing the scheme of conformance control and predicting the validity period. © 2021 Elsevier B.V.
Number of references: 44
Main heading: Creep
Controlled terms: Viscoelasticity - Forecasting - Petroleum reservoir engineering - Petroleum reservoirs
Uncontrolled terms: Conformance control - Equivalence principles - Long-term deformation - Mechanical parameters - Rheological characteristics - Stimulation techniques - Viscoelastic mechanical model - Water injection pressures
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
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31. The Effect of Halide Counter Ions and Methanol on the Foaming Behavior of Cationic Surfactants and a Mechanism Study der Einfluss von Halogenid-Gegenionen und Methanol auf das Schaumvermögen von kationischen Tensiden und eine Mechanismusstudie

Accession number: 20213210744013
Authors: Bai, Yun (1, 2); Zhang, Jie (1); Dong, Sanbao (1); Zhu, Shidong (1, 3); Wang, Manxue (1, 4); Wu, Ya (1); Pu, Chunsheng (2); Chen, Gang (1, 3)
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Abbreviated source title: Tenside Surfactants Deterg
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Publication year: 2021
Pages: 278-286
Language: English
ISSN: 09323414
CODEN: TSDEES
Document type: Journal article (JA)
Publisher: Walter de Gruyter GmbH
Abstract: In this work, four quaternary ammonium cationic surfactants including cetyltrimethyl ammonium fluoride (CTAF), cetyltrimethyl ammonium chloride (CTAC), cetyltrimethyl ammonium bromide (CTAB) and cetyltrimethyl ammonium iodide (CTAI) were investigated to study the effect of halide anions on the surface activity and foaming performance. The result showed that CTAF had superior surface activity, which could reduce the surface tension of water to 33.15 mN/m at a low CMC (critical micelle formation concentration) of 1.65 mmol/L. Based on the calculation of Amin (the minimum occupied area per surfactant molecule), we assumed that this higher surface activity was related to the small ionic radius of the fluorine ion (F-). The foamability and foam stability of CTAF has great advantages over other surfactants studied. On this basis, the factors affecting the formation and stabilization of the CTAF foam were investigated. The results showed that foam formation benefited from high temperatures and low methanol concentration, while high salinity was beneficial for foam stability. When CTAF at a concentration of 0.2% was used as a foaming agent, foaming was excellent at a methanol concentration of 10%, a salinity of 22 104 mg/L, and a temperature of 90°C. With this study, uncertainties that existed in the literature regarding the effect of anion on surface activity and foam performance were explained and the effect of temperature, methanol and salinity on foam generation and stabilization was understood © 2021 Carl Hanser Verlag. All rights reserved.
Number of references: 42
Main heading: Cationic surfactants
Controlled terms: Chlorine compounds - Fluorine compounds - Dyes - Critical micelle concentration - Methanol - Micelles
Uncontrolled terms: Ammonium fluoride - Area per surfactant molecule - Cetyltrimethylammonium bromide - Cetyltrimethylammonium chloride - Effect of temperature - Methanol concentration - Quaternary ammonium - Surface activities
Classification code: 801.3 Colloid Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds
Numerical data indexing: Mass_Density 2.21e+01kg/m3, Molar_Concentration 1.65e+00mol/m3, Percentage 1.00e+01%, Percentage 2.00e-01%, Surface_Tension 3.31e-02N*m, Temperature 3.63e+02K
DOI: 10.1515/tsd-2020-2256

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Compendex references: YES
Database: Compendex
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32. Corrigendum to "Origin and diffusion of the over-mature transitional natural gas in multiple lithologic reservoirs: A case study of Carboniferous-Permian strata in the southeastern margin of Ordos Basin" [International Journal of Coal Geology 219 (2020)] (International Journal of Coal Geology (2020) 219, (S0166516219308195), (10.1016/j.coal.2019.103380))

Accession number: 20214611148826
Authors: Dong, Zhe (1); Zhang, Jinchuan (1, 2); Tang, Xuan (1, 2, 3); Liu, Guangxiang (3); Dang, Wei (4, 5); Liu, Yang (1); Tao, Jia (1); Su, Zexin (1)
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Corresponding author: Tang, Xuan(tangxuan@cugb.edu.cn)
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Abbreviated source title: Int. J. Coal Geol.
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Article number: 103853
Language: English
ISSN: 01665162
CODEN: IJCGDE
Document type: Erratum (ER)
Publisher: Elsevier B.V.
Abstract: The authors regret . (See Fig. 1.) The authors would like to apologise for any inconvenience caused. © 2021 Elsevier B.V.
DOI: 10.1016/j.coal.2021.103853
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33. Effects of combined inoculation microbes on soil dynamic improvement in coal mining subsidence areas

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Title of translation:
Authors: Bi, Yinli (1, 2); Jiang, Bin (2); Qin, Fangling (3); Wang, Zhuoyou (1)
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Source title: Nongye Gongcheng Xuebao/Transactions of the Chinese Society of Agricultural Engineering

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Publication year: 2021
Pages: 85-93
Language: Chinese
ISSN: 10026819
CODEN: NGOXEO
Document type: Journal article (JA)
Publisher: Chinese Society of Agricultural Engineering
Abstract: Deterioration of soil structure has posed a great threat to the farmland and vegetation in ecological and environmental development in large subsided lands, due mainly to excessive coal mining for rapid economic growth in China in recent years. This study aims to accurately and comprehensively evaluate the effects of microorganisms-plants-soil interactions on the soil restoration of damaged ecology caused by coal mining in arid and semi-arid areas. In-situ monitoring was performed on an Amorpha fruticosa L. inoculated by different microorganisms in the coal-mining subsidence area of Daliuta in Shandong Province of eastern China. A systematic evaluation was made on the dynamic ecological effects of inoculated microorganisms (such as mycorrhizal fungi, phosphate solubilizing bacteria or simultaneous inoculation of microorganisms) treatments on the plant growth (plant height and crown width), mycorrhizal effect (mycorrhizal infection rate and hypha density), soil nutrients and properties, the leaf nutrients, and plant resistance under different growth seasons after four years of reclamation in the mining area. A dynamic ecological mechanism of microorganisms was also elucidated in the process of vegetation reclamation in arid and semi-arid coal mine areas. Compared with no inoculation, the inoculation of Funneliformis mosseae, Rhizophagus intraradices, and Bacillus megaterium significantly increased the plant height and crown width of A. fruticosa, as well as the concentration of nitrogen, phosphorus and potassium of A. fruticosa leaves. The reabsorption of leaves and stress resistance of A. fruticosa were also improved remarkably, due possibly to the reduction of relative electrical conductivity and the increase in the accumulation of proline and soluble sugar in the leaves. The soil pH and electrical conductivity were significantly reduced, with an obvious increase in the content of easy-to-extract Glomus (EE-GRSP), total-extract Glomus (T-GRSP), organic carbon, alkali hydrolyzable nitrogen, available phosphorus and available potassium of the rhizosphere soil. There was a significant synergistic effect of inoculation treatments on the growth of A. fruticosa, mycorrhizal infection rate, soil nitrogen, phosphorus and potassium nutrients, EEG and TG content, with the extension of reclamation time. Furthermore, simultaneous inoculation of Funneliformis mosseae and phosphate-dissolving bacteria played a positive role in the plant growth and mycorrhizal effect of A. fruticosa, plant nutrients, and soil stress resistance in arid and semi-arid coal mining areas after 4 years of ecological reclamation. Mycorrhizal fungi were inoculated in the subsided land to maintain sustainable ecological effects. Nevertheless, there was a significant increase in the plant survival/growth rate with a sharp decrease in the nutrient of plant rhizosphere after reclamation about two years. Until four years reclamation, the mycorrhizal fungi with informed hyphal nets contributed to increasing population diversity and absorbing more nutrition from far away space. In natural or managed soil ecosystems, the shifts in the diversity and community structure of arbuscular mycorrhizal fungal (AMF) assemblages over space and time were associated with the plant community succession, anthropogenic activities, and changes in environmental conditions. Such interactions included the mutualistic associations between most vascular plants and their below-ground mycorrhizal symbionts. In any way, the interaction between plant, soil, and mycorrhizal fungi can provide a potential theoretical and practical reference to the restoration of ecological functions and processes in disturbed soil ecosystems, such as post-mining subsided areas. © 2021, Editorial Department of the Transactions of the Chinese Society of Agricultural Engineering. All right reserved.
Number of references: 30
Main heading: Soils
Controlled terms: Biodiversity - Organic carbon - Bacteria - Coal - Coal mines - Coal reclamation - Crops - Dynamics - Nutrients - Potassium - Subsidence - Deterioration - Landforms - Nitrogen - Phosphorus - Reclamation - Soil pollution - Vegetation - Bacteriology - Fungi
Uncontrolled terms: Anthropogenic activity - Arid and semi-arid areas - Coal mining subsidences - Electrical conductivity - Environmental conditions - Environmental development - Phosphate solubilizing bacteria - Relative electrical conductivities
Classification code: 452.3 Industrial Wastes - 454 Environmental Engineering - 481.1 Geology - 483.1 Soils and Soil Mechanics - 503.1 Coal Mines - 524 Solid Fuels - 549.1 Alkali Metals - 804 Chemical Products Generally - 804.1 Organic Compounds - 821.4 Agricultural Products - 951 Materials Science
Numerical data indexing: Age 4.00e+00yr
DOI: 10.11975/j.issn.1002-6819.2021.07.011
Compendex references: YES
Database: Compendex

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34. A New Sandwich Type Metamaterial Plate and Its Mechanism of Low-Frequency Broad Vibration Band Gap

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Title of translation:
Authors: Li, Suobin (1, 2); Wei, Ruyi (2); Zhou, Anan (2); Li, Lixia (3); He, Yanbin (4); Li, Xin (5)
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Publisher: Xi'an Jiaotong University
Abstract: The concept of metamaterial is introduced into sandwich plates to solve the low frequency vibration reduction problem of thick plate structure, and a type of sandwich type metamaterial plate is proposed and theoretically studied. The structure of the proposed plate is mainly composed of sandwich type periodic base plate and embedded with sandwich type periodic vibrator, so it has the characteristics of light weight, high rigid, thick scale and low broadband vibration band gap. The generation mechanism of low frequency broadband vibration band gap in sandwich type metamaterial plate is studied by using a finite element method (FEM). It is found that the local resonance mode of the sandwich type vibrator and the Lamb wave mode of the sandwich type periodic base plate respectively dominate the system response according to the modal superposition principle. When the main modes of the plate and vibrator are coupled to each other, the vibrator suppresses the main modes of the sandwich periodic base plate to make the waveless propagation mode in the sandwich plate to form vibration band gaps. The equivalent stiffness of the sandwich type vibrator is the main factor affecting the characteristics of the band gap, and when it is a mixed stiffness mode, the position and width of the band gap can be adjusted together to form a low broadband vibration band gap. Simulation results show that the designed sandwich vibrator has the characteristics of serial-parallel stiffness, resulting in two equivalent stiffness modes in the vibrator. The two modes adjust the position and width of the band gap respectively at the same time, and finally widen the complete band gap by 7 times at low frequencies. Experimental results show that this type of plate has a good low broadband vibration damping characteristic. The proposed sandwich superplate integrates the advantages of sandwich plate and meta-material/structure, realizes the unification of mechanical bearing and low-frequency band gap vibration reduction, and provides a new idea and method for low-frequency vibration reduction of thick plate structure. © 2021, Editorial Office of Journal of Xi'an Jiaotong University. All right reserved.
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Main heading: Metamaterials
Controlled terms: Surface waves - Vibrations (mechanical) - Vibrators - Energy gap - Plates (structural components) - Stiffness
Uncontrolled terms: Broadband vibration - Equivalent stiffness - Generation mechanism - Low-frequency vibration - Metamaterial plate - Modal superposition - Vibration band gap - Vibration reductions
Classification code: 408.2 Structural Members and Shapes - 601.1 Mechanical Devices - 931.1 Mechanics - 951 Materials Science
DOI: 10.7652/xjtuxb202104009
Compendex references: YES
Database: Compendex
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35. Effect of adsorbed moisture on the pore size distribution of marine-continental transitional shales: Insights from lithofacies differences and clay swelling

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Authors: Li, Pei (1, 2, 3); Zhang, Jinchuan (1, 2); Rezaee, Reza (3); Dang, Wei (4); Tang, Xuan (1, 2); Nie, Haikuan (5); Chen, Shijing (1, 2)
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Source title: Applied Clay Science
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Abstract: The variation in pore water distribution within gas shale reservoirs has a significant effect on gas content, and thus on resource evaluation. However, the characteristics of water micro-distribution and its effects on pore parameters are still not well understood due to the mixed wettability of shale and the complexity of the pore structure. In this study, six lower Permian transitional shale samples from the southern North China Basin, humidified at four levels up to a relative humidity of 98%, were selected for moisture-equilibrated experiments and low-pressure N2 gas adsorption measurements. The results indicate that the adsorbed moisture in transitional clay-rich shales can be divided into capillary condensation water in the micropores and monolayer–multilayer adsorbed water in the non-micropores. Moreover, thermal maturity (VRo), total organic carbon, clay, and carbonate are positively correlated with the adsorbed moisture and micro-/mesopores, indicating that water in shales could be hosted in inorganic pores as well as in organic pores. Furthermore, the distribution of adsorbed moisture is mainly controlled by the VRo, component wettability (i.e., organic matter, clay, pyrite, and carbonate), and pore structure (micro-/mesopore distribution). In addition, a subtle adsorbed moisture may significantly reduce both the pore volume (PV) and specific surface area (SSA) of micropores, and the effect on micropores and SSA is more pronounced than that on the respective non-micropores and PVs. Additionally, the mechanism of clay swelling and pore expansion in clayey shale can provide certain insights for water–methane competitive adsorption, identifying clay type and pore size, and the formation of organo-mineral complexes. © 2020 Elsevier B.V.
Number of references: 141
Main heading: Pore structure
Controlled terms: Gas adsorption - Shale gas - Pore size - Pyrites - Water supply systems - Microporosity - Wetting - Organic carbon
Uncontrolled terms: Adsorption measurement - Capillary condensation - Competitive adsorption - Microdistribution - North China Basin - Resource evaluation - Specific surface area (SSA) - Total Organic Carbon
Classification code: 446.1 Water Supply Systems - 512.2 Natural Gas Deposits - 522 Gas Fuels - 802.3 Chemical Operations - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 9.80e+01%
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No. PLC2020015) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology), and the China Scholarship Council (File No. 201906400058). The authors also thank Editor and anonymous reviewers very much for valuable comments and suggestions that have greatly improved the manuscript. The data for tables and figures are available online: https://github.com/lipeicumt/Moisture-distribution-in-shale/tree/master .
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36. Study on the application of sulfonation catalysis in a new formaldehyde recovery process

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Authors: Yuan, Meng (1, 3); Shao, Yihe (1, 3); Tang, Ruiyuan (2); Li, Jie (1, 3); Niwamanya, Noah (1, 3); Tian, Yuanyu (1, 2, 3, 4); Qiao, Yingyun (1, 3); Li, Dawei (1, 3); Zhang, Jinhong (1, 3)
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Abstract: This study proposed a new catalytic conversion process using a sulfonated catalyst to promote the condensation reaction of methanol and formaldehyde (FA) to form methylal (DMM). This method can remove FA while generating the valuable chemical product DMM. A series of SiO2-xSO3H catalysts were developed, and the synergistic effect of the sulfonic acid group vacancy and hydroxyl vacancy contents was evaluated by adjusting the activation temperature and sulfonation ratio. When the activation temperature was 60 °C, the FA yield reached 82.3%, and DMM selectivity was 80.4%. The FA recovery rate was much higher than in other studies. A series of characterization studies revealed that when there were few -SO3H groups, the hydroxyl content increased, providing more activation centers for forming the formic acid by-product from FA. The dehydration and condensation of formic acid and methanol formed methyl formate (MF). However, when there were too many -SO3H groups, side reactions of methanol and FA occurred preferentially. Therefore, the synergistic effect of the -SO3H group and hydroxyl group content was the fundamental reason for the exceptional catalytic performance. Furthermore, in-situ infrared spectroscopy revealed the possible reaction mechanism of methanol and FA on sulfonated silica gel and verified the conclusion drawn from the catalyst characterization. This approach overcomes the disadvantages of the high cost of FA absorption and difficulty of industrialization due to the high reaction temperature and provides the potential to "turn waste into treasure" during FA recovery while providing new avenues to solving the problem of FA pollution. © 2021 Elsevier B.V.
Number of references: 45
Main heading: Formaldehyde
Controlled terms: Silica gel - Catalysts - Condensation reactions - Methanol - Chemical activation - Infrared spectroscopy - Formic acid - Condensation
Uncontrolled terms: Activation temperatures - Catalytic conversion - Conversion process - Methylal - Recovery process - SiO2-xSO3H - Sulphonation - Synergistic effect - Valuable chemicals -]+ catalyst
Classification code: 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Percentage 8.04E+01%, Percentage 8.23E+01%, Temperature 3.33E+02K
DOI: 10.1016/j.colsurfa.2021.127593

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Funding text: This study was conducted with National Natural Science Foundation of China (No. 21878335 , 21576293 and 21576294), Major scientific and technological innovation projects in Shandong Province of China (No. 2018CXGC0301), the Key Research and Development Program of Shaanxi (No. 2020ZDLSF06–10), Natural Science Basic Research Program of Shaanxi (No. 2021JQ-583)and the Shandong Natural Science Foundation (ZR2017QEE006).
Compendex references: YES
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37. Reliability assessment of ultra-deep oil and gas wellbore casing using data statistics and numerical simulations (*Open Access*)

Accession number: 20205309699651
Authors: Yang, Shangyu (1); Zhang, Renren (2); Wang, Jianjun (1); Li, Xinhong (2); Fan, Heng (3); Yang, Ming (4)
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Publisher: Elsevier Ltd
Abstract: Ultra-deep oil and gas wells have become a new development trend in onshore oil and gas exploitation. However, Ultra-deep oil and gas wellbore casing is with high failure risk due to the harsh environment. It is essential to evaluate the reliability of wellbore casing. This paper assesses the operational reliability of wellbore casing using data statistics and numerical simulation. Firstly, the theoretical model for reliability analysis of wellbore casing is established, and the variables in the model are determined, including rock mechanics, cement ring, and casing string strength factors. Subsequently, considering the random distribution of model variables, many statistics and analyses are performed to determine the distribution parameters of the model variables. Eventually, Monte Carlo based numerical simulations are carried out to obtain the residual strength distribution and the reliability of wellbore casing. The production casing in the ultra-deep well with a depth of 6.5 km in China as an industrial case is used to illustrate the present study. It is observed that this study can be useful to guide a more accurate assessment of the reliability of ultra-deep wellbore casing. © 2020 Elsevier Ltd
Number of references: 29
Main heading: Numerical models
Controlled terms: Boreholes - Oil wells - Monte Carlo methods - Oil field equipment - Reliability analysis - Rock mechanics
Uncontrolled terms: Development trends - Distribution parameters - Operational reliability - Production casings - Random distribution - Reliability assessments - Statistics and analysis - Theoretical modeling
Classification code: 483.1 Soils and Soil Mechanics - 511.2 Oil Field Equipment - 512.1.1 Oil Fields - 921 Mathematics - 922.2 Mathematical Statistics
Numerical data indexing: Size 6.50e+03m
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Development Program of Guangxi; Number: 2019YFF0217504, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China; Number: -, Acronym: -, Sponsor: Key Research and Development Projects of Shaanxi Province;
Funding text: The project is supported by National key Technology R&D Program of China (2019YFF0217504), Special Scientific Research Project of Education Department of Shaanxi Province , China (20JK0729 ; 18JK0608), National Natural Science Foundation of China (U1762211), CNPC Scientific Research and Technology Development Project (2020B-4020) and Key research and development project in Shaanxi Province (2018GY-172).The project is supported by National key Technology R&D Program of China (2019YFF0217504), Special Scientific Research Project of Education Department of Shaanxi Province, China (20JK0729; 18JK0608), National Natural Science Foundation of China (U1762211), CNPC Scientific Research and Technology Development Project (2020B-4020) and Key research and development project in Shaanxi Province (2018GY-172).
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38. Research status and characteristics of advanced hydrocarbon trap evaluation (*Open Access*)

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Conference name: 2020 3rd International Forum on Geoscience and Geodesy, IFGG 2020
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Publisher: IOP Publishing Ltd
Abstract: Advanced hydrocarbon trap evaluation is crucial and necessary for the exploration target optimization decision. Its evaluation conclusion is verified by actual drilling results, so its research status has a direct impact on exploration benefits. This paper discusses the essence of advanced hydrocarbon trap evaluation that focuses on the development of quantitative and integration evaluation under the guidance of exploration target decision. Then, from these aspects, such as the theory method system, the basic geological research, the quantitative evaluation, economic evaluation and degree of computer application, their current situation of the development was unraveled one by one, the research status tends to be the higher degree of computer application, the deep involvement of basic geological research, and integration of multi-disciplinary procedure, the higher qualitative evaluation combined with the quantitative evaluation, and also a research chain of predication and decision-making process so that it needed constantly and actively by the support of different multi-disciplines, such as the system engineering theory and evaluation theory, decision-making theory, computer science and other disciplines to improve the evaluation theory and advanced evaluation methods. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Decision making

Controlled terms: Decision theory - Hydrocarbons - Geology
Uncontrolled terms: Decision making process - Decision-making theories - Disciplinary procedures - Economic evaluations - Exploration targets - Geological research - Qualitative evaluations - Quantitative evaluation
Classification code: 481.1 Geology - 804.1 Organic Compounds - 912.2 Management - 961 Systems Science
DOI: 10.1088/1755-1315/658/1/012046
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39. Unraveling the optical contrast in Sb2Te and AgInSbTe phase-change materials

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Authors: Ahmed, Shehzad (1); Wang, Xudong (1); Zhou, Yuxing (1); Sun, Liang (2); Mazzarello, Riccardo (3, 4); Zhang, Wei (1, 5)
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Abstract: Chalcogenide phase-change materials (PCMs) show a significant contrast in optical reflectivity and electrical resistivity upon crystallization from the amorphous phase and are leading candidates for non-volatile photonic and electronic applications. In addition to the flagship Ge2Sb2Te5 phase-change alloy, doped Sb2Te alloys, in particular AgInSbTe used in rewritable optical discs, have been widely investigated for decades, and nevertheless the theoretical insights on the optical properties of this important family of PCMs are scarce. Here, we carry out thorough ab initio simulations to gain an atomistic understanding of the optical properties of Sb2Te and AgInSbTe. We show that the large optical contrast between the amorphous and crystalline phase stems from the change in bond type in the parent compound Sb2Te. Ag and In impurities serve mostly the purpose of stabilization of the amorphous phase, and have marginal impact on the large variation in the dielectric function upon the phase transitions. Copyright © 2021, The Authors. All rights reserved.
Number of references: 110
Main heading: Phase change materials
Controlled terms: Optical properties - Silver alloys
Uncontrolled terms: Ab initio simulations - Amorphous phasis - Atomistics - Electronics applications - Nonvolatile - Optical contrast - Optical reflectivity - Phase Change - Photonic application - Rewritable optical discs
Classification code: 547.1 Precious Metals - 741.1 Light/Optics
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40. Preparation of an amphiphilic Janus SiO2/fluorinated polyacrylate latex film and its application as a hydrophobic fabric agent

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Authors: Lyu, Bin (1, 2, 4); Li, Xinru (1, 2, 3, 5); Liu, Hui (3); Gao, Dangge (1, 2, 4); Ma, Jianzhong (1, 3); Zhang, Mengyu (1, 2, 4)

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Corresponding author: Gao, Dangge
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Publisher: Academic Press Inc.
Abstract: Amphiphilic Janus particles are characterized by their anisotropic morphology and unique physical and chemical properties. In the present research, amphiphilic Janus particles were used as stabilizing agents to prepare a fluorine-containing polyacrylate composite emulsion. The influences of the structure and dosage of amphiphilic Janus SiO2 particles and the amount of fluorine-containing monomer hexafluorobutyl methacrylate on the stability of the composite emulsion were investigated. It was noticed that when the hydrophilic and hydrophobic groups of Janus SiO2 particles were polyacrylamide and polymethyl methacrylate, respectively, the stabilization of the polyacrylate emulsion with Janus SiO2 particles was achieved. When 0.3 wt% of polyacrylamide/polymethyl methacrylate amphiphilic Janus SiO2 particles and 8 wt% of hexafluorobutyl methacrylate were used, a stable composite emulsion was obtained. The conversion rate reached 98.7% with an average particle size of 500 nm. The composite emulsion was applied for fabric finishing. The water contact angle of the fabric increased from 21.4° to 140.2°, demonstrating its greatly improved hydrophobicity. Therefore, it could be inferred that the synergistic effect of amphiphilic Janus SiO2 nanoparticles and hexafluorobutyl methacrylate improved the water resistance of the latex film. © 2021 Elsevier Inc.
Number of references: 16
Main heading: Particle size
Controlled terms: SiO2 nanoparticles - Hydrophobicity - Contact angle - Silica nanoparticles - Silicon - Fluorine - Film preparation - Polymethyl methacrylates - Emulsification
Uncontrolled terms: Average particle size - Composite emulsions - Fluorine-containing polyacrylates - Hydrophilic and hydrophobic - Physical and chemical properties - Polyacrylate emulsion - Polyacrylate latices - Water contact angle
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 761 Nanotechnology - 802.3 Chemical Operations - 804 Chemical Products Generally - 815.1.1 Organic Polymers - 931.2 Physical Properties of Gases, Liquids and Solids
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Database: Compendex
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41. Cometabolism accelerated simultaneous ammoxidation and organics mineralization in an oxygen-based membrane biofilm reactor treating greywater under low dissolved oxygen conditions

Accession number: 20212310454304
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Corresponding authors: Zhou, Yun(yzhou112@mail.hzau.edu.cn); Liu, Yang(yang.liu@ualberta.ca)
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Article number: 147898
Language: English
ISSN: 00489697
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Publisher: Elsevier B.V.
Abstract: Carbon/nitrogen ratio is an important parameter during the biological wastewater treatment. Our study emphasizes revealing the mechanisms of chemical oxygen demand/total nitrogen (COD/TN) ratio dependent improved greywater (GW) treatment in an oxygen based membrane biofilm reactor (O2-MBfR). Results showed that reducing COD/TN ratio from 40 to 20 g COD/g N by supplementing NH4Cl to GW improved the relative abundance of genera related to LAS-biodegradation (from 8.39% to 35.7%), nitrification (from 0.20% to 0.62%) and denitrification (from 3.01% to 7.59%). Reducing COD/TN ratio also led to an increase in the ammonia monooxygenase (AMO) activity (from 7.56 to 10.2 mg N/g VSS-h), as well as improved ammoxidation and linear alkylbenzene sulfonate (LAS) mineralization although the dissolved oxygen (DO) concentration and pH decreased. Much higher NH4+ - N at lower COD/TN ratio (10 units) led to lower DO (0.13 ± 0.01 mg/L) and pH (6.72 ± 0.02), but the continuously increased AMO activity (up to 12.9 mg N/g VSS-h) enabled the cometabolism of ammoxidation and LAS mineralization, leading to the efficient removal of organics and nitrogen under the low DO condition. © 2021 Elsevier B.V.
Number of references: 29
Main heading: Biofilms
Controlled terms: Ammonia - Bioreactors - Chlorine compounds - Biodegradation - Dissolved oxygen - Nitrogen - Nitrogen removal - Biochemical oxygen demand - Wastewater treatment - Biological water treatment - Mineralogy
Uncontrolled terms: Ammonia monooxygenase activity - Ammoxidation - Chemical-oxygen demands - Co metabolisms - Greywater - Low dissolved oxygen - Mineralisation - Organic mineralization - Oxygen-based membrane biofilm reactor - Total nitrogen
Classification code: 445.1 Water Treatment Techniques - 452.4 Industrial Wastes Treatment and Disposal - 461.8 Biotechnology - 462.5 Biomaterials (including synthetics) - 482 Mineralogy - 801.2 Biochemistry - 802.1 Chemical Plants and Equipment - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Mass 1.29E-05kg, Mass 4.00E-02kg to 2.00E-02kg, Mass 7.56E-06kg to 1.02E-05kg, Mass density 1.30E-04kg/m3, Percentage 2.00E-01% to 6.20E-01%, Percentage 3.01E+00% to 7.59E+00%, Percentage 8.39E+00% to 3.57E+01%, Volume 4.00E-05m3
DOI: 10.1016/j.scitotenv.2021.147898
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Compendex references: YES
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Data Provider: Engineering Village
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42. Study on the optimized Al2O3–SO3H catalysis for a new formaldehyde recovery process

Accession number: 20214010987633

Authors: Yuan, Meng (1, 3); Kong, Jie (1); Zhao, Jialin (1, 3); Tang, Ruiyuan (2); Tian, Yuanyu (1, 2, 3, 4); Qiao, Yingyun (1, 3)
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Corresponding authors: Tian, Yuanyu(tianyy1008@126.com); Qiao, Yingyun(qiao_yingyun@126.com)
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ISSN: 03603199
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Formaldehyde is a dangerous chemical present in many industrial waste gases. It can be recovered via catalytic processes; however, many of these require costly precious metals operating under limited reaction temperatures, making their industrialization difficult. This paper proposes a novel method of formaldehyde recovery. A sulfonation catalyst is used to promote a condensation reaction of methanol and formaldehyde to form methylal. Hence, a valuable chemical product is obtained while removing formaldehyde. A series of Al2O3-xSO3H catalysts were designed and the effects of surface acidity and hydroxyl groups on catalytic activity were explored by varying the activation temperature and sulfonation ratio. At an activation temperature of 60 °C, the yield of formaldehyde reaches 78.62% and the selectivity to methylal reaches 80.11%. This recovery rate is much higher than those reported in other studies. Through a series of characterizations, it was found that when the content of –SO3H groups is low, the hydroxyl content increases, which provides more activation centers for the formation of by-product formic acid from formaldehyde, and for the dehydration and condensation of formic acid and methanol to form methyl formate. At the same time, when the content of –SO3H groups is too high, side reactions of methanol and formaldehyde occur preferentially. Therefore, the synergistic effect of the contents of –SO3H and hydroxyl groups is the fundamental cause of the excellent catalytic performance. Based on in-situ infrared research, a possible mechanism of the reaction between methanol and formaldehyde on sulfonated silica gel is proposed, which also verifies the characterization of the catalyst. This research presents new possibilities for solving the problem of formaldehyde pollution. © 2021 Hydrogen Energy Publications LLC
Number of references: 46
Main heading: Formaldehyde
Controlled terms: Alumina - Formic acid - Aluminum oxide - Condensation - Condensation reactions - Methanol - Catalyst activity - Chemical activation - Silica gel
Uncontrolled terms: Activation temperatures - Al2O3-xSO3H - Catalytic process - Hydroxyl groups - Industrial waste gas - Methylal - Reaction temperature - Recovery process - Sulphonation -]+ catalyst
Classification code: 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 7.862E+01%, Percentage 8.011E+01%, Temperature 3.33E+02K
DOI: 10.1016/j.ijhydene.2021.09.058
Funding Details: Number: ZR2017QEE006, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province; Number: 21JK0842, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2020ZDLSF06-10, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project; Number: 2021JQ-583, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province; Number: 2018CXGC0301, Acronym: -, Sponsor: Major Scientific and Technological Innovation Project of Shandong Province;
Funding text: This study was conducted with National Natural Science Foundation of China (No. 21878335 , 21576293 and 21576294), Major scientific and technological innovation projects in Shandong Province of China (No. 2018CXGC0301), the Key Research and Development Program of Shaanxi (No. 2020ZDLSF06-10), Natural Science Basic Research Program of Shaanxi (No. 2021JQ-583), Scientific Research Program Funded by Shaanxi Provincial Education Department Program (No. 21JK0842) and the Shandong Natural Science Foundation (No. ZR2017QEE006).
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village
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43. Preface (*Open Access*)

Accession number: 20213810909588
Authors: Chen, Yuanzhu (1); Gao, Wei (2); Wang, Xingang (3); Zhang, Lei (4); Hassan, Quazi K. (5); Qi, Shanzhong (6); Liang, Weifeng (7); Chu, Xianhong (8); Yang, Xinfa (9); Jiang, Lishuai (10); Debayle, Johan (11); Li, Bobo (12); Zhang, Di (13); Yin, Deyu (14); Xiao, He (7); Yuan, Long (15); Feng, Xuliang (16); Liu, Lei (17)
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 2006
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Article number: 011001
Language: English
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Conference name: 2021 International Conference on Computer, Remote Sensing and Aerospace, CRSA 2021
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Conference location: Tokyo, Virtual, Japan
Conference code: 171601
Publisher: IOP Publishing Ltd
DOI: 10.1088/1742-6596/2006/1/011001
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village
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44. A PW12/Ag functionalized mesoporous silica-coated magnetic Fe3O4core-shell composite as an efficient and recyclable photocatalyst

Accession number: 20210409831118
Authors: Wu, Pan-Feng (1, 2); Xue, Qi (3); Wang, Tian-Yu (2); Li, Shan-Jian (1); Li, Gao-Peng (4); Xue, Gang-Lin (2)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Xi'An Shiyou University, 18 Dianzi Road, Yanta District, Xi'an; 710065, China; (2) Key Laboratory of Synthetic and Natural Functional Molecule Chemistry, College of Chemistry and Materials Science, Northwest University, 1 Xuefu Ave., Xi'an; 710127, China; (3) Xi'An Modern Chemistry Research Institute, Xi'an; 710065, China; (4) Key Laboratory of Magnetic Molecules and Magnetic Information Materials (Ministry of Education), School of Chemistry and Material Science, Shanxi Normal University, Linfen; 041004, China
Corresponding authors: Wu, Pan-Feng(wupf801@163.com); Xue, Gang-Lin(xglin707@163.com); Li, Gao-Peng(nwuligp@163.com)
Source title: Dalton Transactions
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Language: English
ISSN: 14779226
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CODEN: DTARAF
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: The novel composite, Fe3O4@SiO2@mSiO2-PW12/Ag, was successfully prepared by in situ loading Ag nanoparticles (Ag NPs) on the surface of grafted phosphotungstate (denoted as PW12) Fe3O4@SiO2@mSiO2via a photoreduction deposition method. PW12 not only acts as a reducing agent and stabilizer for Ag NPs but also as a bridge to link Ag NPs and the SiO2 shell in the loading process. Its activity toward the photodegradation of methyl orange (MO) and photoreduction of Cr2O72- anions was evaluated. Experimental results showed that Fe3O4@SiO2@mSiO2-PW12/Ag with 5.3 wt% Ag loading and 18.65 wt% of PW12 exhibits the highest photocatalytic efficacy, and complete degradation of MO and 91.2% photoreduction of Cr(vi) were realized under simulated sunlight for 75 min, respectively. The enhanced catalytic activities of the composite are due to its high specific surface area, the synergistic effect among the components and the formation of a heterojunction of PW12/Ag. The possible enhanced photocatalytic mechanism is proposed. The catalyst is durable and can be easily recovered using a magnet for recycling without a significant loss of catalytic activity. © 2021 The Royal Society of Chemistry.
Number of references: 40
Main heading: Silica
Controlled terms: Chromium compounds - Magnetite - Silicon - Degradation - Heterojunctions - Silver nanoparticles - Azo dyes - Catalyst activity
Uncontrolled terms: Ag nanoparticle - Deposition methods - Enhanced catalytic activity - High specific surface area - Mesoporous Silica - Phosphotungstate - Simulated sunlight - Synergistic effect
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 714.2 Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Percentage 9.12e+01%, Time 4.50e+03s
DOI: 10.1039/d0dt03882b
Funding Details: Number: 2020KJRC0096, Acronym: -, Sponsor: -; Number: 21673176, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 02070515, Acronym: SXNU, Sponsor: Shanxi Normal University;
Funding text: This research was supported by the National Natural Science Foundation of China (21673176), the start-up fund for doctor research of Shanxi Normal University (02070515) and the Xi'an Science and Technology Innovation Talent Service Enterprise Project (2020KJRC0096).This research was supported by the National Natural Science Foundation of China (21673176), the start-up fund for doctor research of Shanxi Normal University (02070515) and the Xi'an Science and Technology Innovation Talent Service Enterprise Project (2020KJRC0096).
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45. Ultra-selective ion sieve for thorium recovery from rare earth elements using oxygen-rich microporous carbon adsorption

Accession number: 20212110403657
Authors: Gao, Yangyang (1); Xu, Lihong (1); Zhang, Meng (1); Zhang, Qian (1); Yang, Zhencong (1); Yang, Jialun (1); Xu, Zhanglian (1); Lv, Ying (2); Wang, Yin (3, 4)
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Corresponding authors: Xu, Zhanglian(xuzhanglian@xjtu.edu.cn); Wang, Yin(yinwang@sjtu.edu.cn)
Source title: Journal of Hazardous Materials
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Volume: 417
Issue date: September 5, 2021
Publication year: 2021
Article number: 126115

Language: English
ISSN: 03043894
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CODEN: JHMAD9
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Publisher: Elsevier B.V.
Abstract: The ultra-selective extraction of thorium ions (Th(IV)) from lanthanides is of significance to both solve the radioactive pollution issue in rare earth (RE) production and sustainably provide thorium fuel for the liquid fluoride thorium reactors (LFTR). However, it remains a great challenge. Here, we reported an oxygen-rich microporous carbon for ultra-selective extraction of Th(IV) from rare earth elements (REEs) in a wide pH range. This selectivity was derived from the synergy of the oxygen-rich nature, microporous structure of the carbons, the chemical valence, and the ionic size of Th(IV) species. This oxygen-rich microporous carbon presented an ultra-high distribution coefficient (Kd) of 1.15 × 108 mL g-1 for Th(IV) at pH 4.9 in the presence of 15 REEs and revealed outstanding performance for Th(IV) extraction from three simulated RE solutions with high ionic strength of lanthanides. Meanwhile, an exceptional adsorption capacity of 624.98 mg g-1 was obtained in the single Th(IV) solution. Both values were superior to those of reported adsorbents. More importantly, the new adsorbent developed here could be prepared from cigarette butts. These features ensured the oxygen-rich carbon as a promising and cost-effective adsorbent for high-purity thorium extraction from REEs. © 2021 Elsevier B.V.
Number of references: 49
Main heading: Oxygen
Controlled terms: Fluorine compounds - Rare earth elements - Cost effectiveness - Ionic strength - Thorium compounds - Carbon - Rare earths - Europium compounds - Microporosity - Extraction - Gas adsorption
Uncontrolled terms: Carbon adsorption - Ion sieve - Microporous carbons - Oxygen-rich microporous carbon - Radioactive pollution - Rare earth production - Rare-earths - Selective extraction - Selectivity - Thorium fuels
Classification code: 547.2 Rare Earth Metals - 801.4 Physical Chemistry - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 911.2 Industrial Economics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Mass 6.2498E-04kg, Size 1.2446E-01m, Volume 8.00E-06m3
DOI: 10.1016/j.jhazmat.2021.126115
Funding Details: Number: 21906128, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 7121181102, Acronym: XJTU, Sponsor: Xi’an Jiaotong University; Number: 1191329183, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 21906128), Young Talent Support Plan of Xi’an Jiaotong University (No. 7121181102), and the program of Fundamental Research Funds for the Central Universities (No. 1191329183). We also thank Dr. Jiao Li from Instrumental Analysis Center of Xi’an Jiaotong University for TEM measurements.
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Database: Compendex
Data Provider: Engineering Village
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46. Twisted van der Waals materials for photonics

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Title of translation:
Authors: Zheng, Jia-Lu (1); Dai, Zhi-Gao (2); Hu, Guang-Wei (3); Ou, Qing-Dong (4); Zhang, Jin-Rui (1); Gan, Xue-Tao (5); Qiu, Cheng-Wei (3); Bao, Qiao-Liang (4, 6)
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Corresponding authors: Zheng, Jia-Lu(zhengjialu_xsy@163.com); Qiu, Cheng-Wei(chengwei.qiu@nus.edu.sg); Bao, Qiao-Liang(qiaoliang.bao@gmail.com)
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Publisher: Editorial Office of Chinese Optics
Abstract: Polaritons are half-light, half-matter quasi-particles formed by the interaction of light and different polarons. They can be applied for light-control at sub-wavelength scales and have shown intriguing potential for optical imaging, enhanced nonlinear optics and novel metamaterial design. Recent advances in the twistronics of two-dimensional van der Waals materials have enabled a vast variety of extraordinary phenomena associated with moiré physics, which also inspired new direction for the research of polaritons. In this article, we briefly review the rise of "twist-photonics", including plasmon polaritons in twisted graphene system, exciton polaritons in a twisted transition-metal dichalcogenide system and phonon polaritons in a twisted h-BN and α -MoO3 system. Twist van der Waals materials may offer new directions to manipulate light-matter interactions at nanoscale. © 2021, China Science Publishing & Media LTD. All right reserved.
Number of references: 85
Main heading: Polariton
Controlled terms: Graphene - Light - Molybdenum oxide - Nonlinear optics - Phonons - Photons - Transition metals - Van der Waals forces
Uncontrolled terms: Light control - Optical imaging - Polaritons - Quasiparticles - Sub-wavelength - Twistronic - Two-dimensional materials - Van der Waal - Van der waal material - Wavelength scale
Classification code: 531 Metallurgy and Metallography - 741.1 Light/Optics - 741.1.1 Nonlinear Optics - 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally - 931.3 Atomic and Molecular Physics
DOI: 10.37188/CO.2021-0023
Funding Details: Number: LHTD20170006, Acronym: -, Sponsor: -; Number: 2021JQ-603, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: 2021-01-252021-02-26 ""No. LHTD20170006 (No. 2021JQ-603) Supported by Shenzhen Nanshan District Pilotage Team Program (No. LHTD20170006); the Natural Science Foundation Research Project of Shaanxi Province (No. 2021JQ-603)
Compendex references: YES
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47. Computational study on effects of jet fans to traffic force in highway tunnel

Accession number: 20213710882539
Authors: Yin, Mingjian (1, 3); Hu, Haihang (1, 3); Wu, Ke (1, 2, 3); Wei, Yanji (4); Zhang, Xin (5); Zhu, Kai (6); Yan, Xiaolong (7)
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Corresponding author: Wu, Ke(wuke@zju.edu.cn)
Source title: Tunnelling and Underground Space Technology
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Volume: 118
Issue date: December 2021
Publication year: 2021
Article number: 104155
Language: English
ISSN: 08867798
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Traffic force induced by the piston effect of moving vehicles is a major driving force to the airflow in road tunnels. To ensure an adequate flow rate in the tunnel, an accurate estimation to the traffic force is necessary. This work investigates the influence of jet fans to the traffic force of a large vehicle in a long highway tunnel. A numerical model of airflow in the tunnel is established based on RANS (Reynolds Averaged Narvier-Stokes) equations, and dynamic mesh method is utilized to simulate the moving vehicle. Results show that, traffic force is significantly

amplified when the vehicle passes the jet fans, which can be explained by the non-uniform velocity profile under the entrainment of high-speed jets. A parametric analysis is conducted to the effects of initial jet velocity, vehicle speed and ventilating velocity of tunnel. Finally, an improved correlation is proposed to evaluate the drag coefficient and traffic force of the vehicle within the affecting range of air jets. © 2021 Elsevier Ltd
Number of references: 27
Main heading: Computational fluid dynamics
Controlled terms: Mesh generation - Velocity - Vehicles - Numerical methods - Drag - Navier Stokes equations
Uncontrolled terms: Computational studies - Driving forces - Dynamic mesh - Highway tunnel - Jet fans - Jetflows - Moving vehicles - Piston effect - Traffic force - Tunnel ventilation
Classification code: 723.5 Computer Applications - 921.2 Calculus - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods - 931.1 Mechanics
DOI: 10.1016/j.tust.2021.104155
Funding Details: Number: 202113, Acronym: -, Sponsor: -; Number: LY19E080028, Acronym: ZJNSF, Sponsor: Natural Science Foundation of Zhejiang Province; Number: 20JK0840, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2018C03029, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project; Number: 2020JQ-779, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This research is supported by: Natural Science Foundation of Zhejiang province (No. LY19E080028); Key Research and Development Project of Zhejiang Province (No. 2018C03029); Ningbo Transportation Science and Technology Plan Project (202113); Natural Science Basic Research Program of Shaanxi (No. 2020JQ-779); Shaanxi Provincial Education Department (No. 20JK0840).
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48. Enhancing tight oil recovery using CO2 huff and puff injection: An experimental study of the influencing factors

Accession number: 20211310155755
Authors: Ding, MingChen (1, 2, 3, 4); Wang, Yefei (1, 3, 4); Liu, Dexin (1, 3, 4); Wang, Xia (5); Zhao, Hailong (1, 3, 4); Chen, Wuhua (1, 3, 4)
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Corresponding author: Ding, MingChen(Dingmc@upc.edu.cn)
Source title: Journal of Natural Gas Science and Engineering
Abbreviated source title: J. Nat. Gas Sci. Eng.
Volume: 90
Issue date: June 2021
Publication year: 2021
Article number: 103931
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: A series of core flooding tests were conducted using a specially-designed matrix–fracture model to assess the performance of CO2 huff and puff ('huff-n-puff') injection with respect to the enhanced oil recovery (EOR) of tight oil. Four key influencing factors were taken into consideration: number of huff-n-puff cycles, matrix permeability, matrix size, and gas type. The results imply that CO2 huff-n-puff injection is capable of effectively recovering tight matrix oil, and there is an optimal cycle regime for such huff-n-puff processes which depends on matrix permeability, matrix size, etc. As the permeability of the matrix is less than 30.0 md, the effectiveness of CO2 huff-n-puff is significantly weakened as the permeability decreases, indicating the great difficulty encountered when developing tight oil reservoirs. Above this value, such effect diminishes. As the matrix size increases, oil recovery using CO2 huff-n-puff decreases and the effect is more obvious when the permeability is low. But, in general, matrix size has a weaker effect on EOR than permeability. Natural gas is a promising albeit less effective alternative when CO2 is unavailable. © 2021 Elsevier B.V.

Number of references: 36
Main heading: Carbon dioxide
Controlled terms: Enhanced recovery - Petroleum reservoir engineering - Low permeability reservoirs - Oil well flooding - Fracture
Uncontrolled terms: CO2 huff-n-puff - Core flooding test - Enhanced-oil recoveries - Fracture model - Influencing factor - matrix - Matrix permeability - Matrix size - Oil recoveries - Tight oil
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 804.2 Inorganic Compounds - 951 Materials Science
DOI: 10.1016/j.jngse.2021.103931
Funding Details: Number: KFJJ-TZ-2019-3, Acronym: -, Sponsor: -; Number: 51504275,51974344, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: ZR2020ME089, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province;
Funding text: The authors wish to thank the Natural Science Foundation of Shandong Province of China (Grant No. ZR2020ME089), the Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs (Grant No. KFJJ-TZ-2019-3), and the National Natural Science Foundation of China (Grant No. 51504275 and 51974344) for their financial support.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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49. A systematic experimental and modeling study of water adsorption/desorption behavior in organic-rich shale with different particle sizes

Accession number: 20212510519236
Authors: Dang, Wei (1, 2); Jiang, Shu (3); Zhang, Jinchuan (4); Li, Pei (4); Nie, Haikuan (5); Liu, Yang (4); Li, Fei (1); Sun, Jiangtao (1); Tao, Jia (4); Shan, Chang'an (1); Tang, Xuan (4); Wang, Ruijing (1); Yin, Yuyi (1, 6)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation, Chengdu University of Technology, Chengdu; 610059, China; (3) Key Laboratory of Tectonics and Petroleum Resources of Ministry of Education, China University of Geosciences, Wuhan; 430074, China; (4) School of Energy Resources, China University of Geosciences, Beijing; 100083, China; (5) Petroleum Exploration and Production Research Institute, SINOPEC, Beijing; 100083, China; (6) Changqing Branch of Geophysical Research Institute, Bureau of Geophysical Prospecting, CNPC, Xi'an; 710021, China
Corresponding author: Dang, Wei(dangw@xsyu.edu.cn)
Source title: Chemical Engineering Journal
Abbreviated source title: Chem. Eng. J.
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Issue date: December 15, 2021
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Article number: 130596
Language: English
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CODEN: CMEJAJ
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Publisher: Elsevier B.V.
Abstract: Understanding the behavior of water-shale adsorption/desorption is of fundamental importance in evaluating in situ shale oil/gas reserves, improving shale oil/gas production and reducing the environmental impact of fracturing fluids. The isotherms and kinetics of water adsorption and desorption in organic-rich shale with three particle sizes (20–40 mesh, 40–60 mesh and 60–80 mesh) were measured at temperatures of 293 K, 303 K and 313 K, and the unclosed hysteresis behavior in water-shale adsorption/desorption isotherms was studied. Then, six thermodynamic models (including the DS1, DS2, DW, BET, GAB and Dent models) and four kinetic models (including the PFO, PSO, DE and Unipore models) were used to interpret the isotherms and kinetics, respectively. Furthermore, thermodynamic parameters, including #H, #S and #G, and kinetic parameters, including the rate constants and activation energy, were extracted. Finally, these results are discussed in relation to the pore structure, surface functional groups, temperature, relative pressure and particle size. This work provides a systematic understanding of the isotherms, hysteresis, thermodynamics and kinetics of water adsorption/desorption in organic-rich shale. © 2021 Elsevier B.V.
Number of references: 84
Main heading: Particle size

Controlled terms: Adsorption isotherms - Kinetic theory - Kinetic parameters - Mesh generation - Activation energy - Hysteresis - Pore structure - Environmental impact - Rate constants - Adsorption
Uncontrolled terms: Adsorption/desorption - Desorption behavior - Different particle sizes - Gas reserves - Model study - Oil gas - Oil/gas production - Organic-rich shales - Particles sizes - Water adsorption
Classification code: 454.2 Environmental Impact and Protection - 631.1 Fluid Flow, General - 723.5 Computer Applications - 802.2 Chemical Reactions - 802.3 Chemical Operations - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 961 Systems Science
Numerical data indexing: Temperature 2.93E+02K, Temperature 3.03E+02K, Temperature 3.13E+02K
DOI: 10.1016/j.cej.2021.130596
Funding Details: Number: 2019QNKYCXTD05,TPR-2019-01, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation;
Funding text: This study was supported by Open Fund (PLC2020015) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology), the Open Funding of Key Laboratory of Tectonics and Petroleum Resources, Ministry of Education (TPR-2019-01), and Research on Clastic Sedimentology and Reservoir Evaluation (2019QNKYCXTD05).
Compendex references: YES
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50. Change in Structure of Amorphous Sb–Te Phase-Change Materials as a Function of Stoichiometry (*Open Access*)

Accession number: 20211310143501
Authors: Ahmed, Shehzad (1, 2); Wang, Xudong (1, 2); Li, Heming (1, 2); Zhou, Yuxing (1, 2); Chen, Yuhan (1, 2, 3); Sun, Liang (4); Zhang, Wei (1); Mazzarello, Riccardo (3, 5)
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Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: Chalcogenide phase-change materials (PCMs) are a leading candidate for non-volatile memory and neuro-inspired computing applications. Antimony telluride alloys can be made into fast and robust PCMs by proper doping. Depending on the compositional ratio, the amorphous state of these alloys shows either nucleation- or growth-driven crystallization dynamics at elevated temperatures. In this work, thorough ab initio simulations are carried out to study the structural properties and bonding nature of six Sb–Te alloys with varied composition from 2:3 to 4:1. Despite all of the compounds showing similar local structural motifs consisting of defective octahedral configurations, a gradual change in medium range order and cavity concentration is observed as the Sb content increases. This trend is responsible for the reduction in the nucleation rate, thus leading to growth-driven crystallization. In addition, the degree of charge transfer decreases as the composition approaches the Sb end, reducing the driving force for long-term mass transport and phase separation upon extensive cycling in devices. © 2021 The Authors. physica status solidi (RRL) Rapid Research Letters published by Wiley-VCH GmbH
Number of references: 120

Main heading: Molecular dynamics
Controlled terms: Charge transfer - Antimony compounds - Phase change materials - Alloys - Digital storage - Nucleation - Phase separation
Uncontrolled terms: Ab initio simulations - Compositional ratio - Computing applications - Crystallization dynamics - Degree of Charge Transfer - Elevated temperature - Medium range order - Non-volatile memory
Classification code: 531.1 Metallurgy - 641.1 Thermodynamics - 722.1 Data Storage, Equipment and Techniques - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 933.1.2 Crystal Growth
DOI: 10.1002/pssr.202100064
Funding Details: Number: BP2018008, Acronym: -, Sponsor: -; Number: SFB 917, Acronym: DFG, Sponsor: Deutsche Forschungsgemeinschaft; Number: 61774123, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: XJTU, Sponsor: Xi’an Jiaotong University; Number: -, Acronym: CSC, Sponsor: China Scholarship Council; Number: 20202212, Acronym: -, Sponsor: State Key Laboratory for Mechanical Behavior of Materials;
Funding text: The authors acknowledge P.C. Schmitz for useful discussions. S.A. thanks the financial support by Chinese Scholarship Council. W.Z. thanks the support of National Natural Science Foundation of China (61774123), 111 Project 2.0 (BP2018008) and the International Joint Laboratory for Micro/Nano Manufacturing and Measurement Technologies of Xi'an Jiaotong University. L.S. thanks the support of the open fund of State Key Laboratory for Mechanical Behavior of Materials (20202212). R.M. acknowledges funding by the DFG (German Science Foundation) within the collaborative research centre SFB 917 "Nanoswitches." The authors acknowledge the computational resources provided by the HPC platform of Xi'an Jiaotong University.The authors acknowledge P.C. Schmitz for useful discussions. S.A. thanks the financial support by Chinese Scholarship Council. W.Z. thanks the support of National Natural Science Foundation of China (61774123), 111 Project 2.0 (BP2018008) and the International Joint Laboratory for Micro/Nano Manufacturing and Measurement Technologies of Xi'an Jiaotong University. L.S. thanks the support of the open fund of State Key Laboratory for Mechanical Behavior of Materials (20202212). R.M. acknowledges funding by the DFG (German Science Foundation) within the collaborative research centre SFB 917 ?Nanoswitches.? The authors acknowledge the computational resources provided by the HPC platform of Xi'an Jiaotong University. Open access funding enabled and organized by Projekt DEAL.
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Open Access type(s): All Open Access, Green
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51. Novel Method Based on Hollow Laser Trapping-LIBS-Machine Learning for Simultaneous Quantitative Analysis of Multiple Metal Elements in a Single Microsized Particle in Air

Accession number: 20210509858682
Authors: Niu, Chen (1); Cheng, Xuemei (1); Zhang, Tianlong (2); Wang, Xing (3); He, Bo (1); Zhang, Wending (1); Feng, Yaozhou (2); Bai, Jintao (1); Li, Hua (2, 4)
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CODEN: ANCHAM
Document type: Journal article (JA)

Publisher: American Chemical Society
Abstract: Elemental identification of individual microsized aerosol particles is an important topic in air pollution studies. However, simultaneous and quantitative analysis of multiple constituents in a single aerosol particle with the noncontact in situ manner is still a challenging task. In this work, we explore the laser trapping-LIBS-machine learning to analyze four elements (Zn, Ni, Cu, and Cr) absorbed in a single micro-carbon black particle in air. By employing a hollow laser beam for trapping, the particle can be restricted in a range as small as $_{\sim 1.72}$ μm, which is much smaller than the focal diameter of the flat-topped LIBS exciting laser $_{(\sim 20}$ μm). Therefore, the particle can be entirely and homogeneously radiated, and the LIBS spectrum with a high signal-to-noise ratio (SNR) is correspondingly achieved. Then, two types of calibration models, i.e., the univariate method (calibration curve) and the multivariate calibration method (random forests (RF) regression), are employed for data processing. The results indicate that the RF calibration model shows a better prediction performance. The mean relative error (MRE), relative standard deviation (RSD), and root-mean-squared error (RMSE) are reduced from 0.1854, 363.7, and 434.7 to 0.0866, 179.8, and 216.2 ppm, respectively. Finally, simultaneous and quantitative determination of the four metal contents with high accuracy is realized based on the RF model. The method proposed in this work has the potential for online single aerosol particle analysis and further provides a theoretical basis and technical support for the precise prevention and control of composite air pollution. © 2021 The Authors. Published by American Chemical Society.
Number of references: 33
Main heading: Decision trees
Controlled terms: Laser beams - Aerosols - Metal nanoparticles - Machine learning - Metal analysis - Air pollution - Carbon black - Data handling - Mean square error - Random forests - Signal to noise ratio
Uncontrolled terms: Elemental identifications - High signalto-noise ratios (SNR) - Multivariate calibration methods - Prediction performance - Prevention and controls - Quantitative determinations - Relative standard deviations - Root mean squared errors
Classification code: 451 Air Pollution - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 723.4 Artificial Intelligence - 723.4.2 Machine Learning - 744.8 Laser Beam Interactions - 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.2 Mathematical Statistics - 961 Systems Science
DOI: 10.1021/acs.analchem.0c04155
Funding Details: Number: 2018TD-018, Acronym: -, Sponsor: -; Number: 11874299,22073074,51927804,61805200,61805200 11874299, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020JM-432, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: SKLST201906, Acronym: SKLTOP, Sponsor: State Key Laboratory of Transient Optics and Photonics;
Funding text: We appreciate Dr. Dongbin Qian (Institute of Modern Physics Chinese Academy of Sciences) for the useful discussion and the funds from the National Natural Science Foundation of China (NSFC) (61805200 11874299, 22073074, 51927804), Natural Science Foundation of Shaanxi Province (No. 2020JM-432), the State Key Laboratory of Transient Optics and Photonics (SKLST201906), and Innovation capability support plan of Shaanxi province (No. 2018TD-018).We appreciate Dr. Dongbin Qian (Institute of Modern Physics, Chinese Academy of Sciences) for the useful discussion and the funds from the National Natural Science Foundation of China (NSFC) (61805200, 11874299, 22073074, 51927804), Natural Science Foundation of Shaanxi Province (No. 2020JM-432), the State Key Laboratory of Transient Optics and Photonics (SKLST201906), and Innovation capability support plan of Shaanxi province (No. 2018TD-018).
Compendex references: YES
Database: Compendex
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52. Lumen air pressure (LAP) affecting greywater treatment in an oxygen-based membrane biofilm reactor (O2-MBfR)

Accession number: 20210309776934
Authors: Zhou, Yun (1, 2); Li, Ran (2, 3); Guo, Bing (2, 4); Yu, Najiaowa (2); Xia, Siqing (5); Liu, Yang (2)
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Source title: Chemosphere

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Article number: 129541
Language: English
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E-ISSN: 18791298
CODEN: CMSHAF
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Several technologies have been employed to treat greywater (GW) for domestic use. Aerobic biological treatment has achieved high efficiency, the main cost being the necessary source of oxygen (O2). This study explores the effects of lumen air pressure (LAP) on reactor performance and microbial community succession in an O2-based membrane biofilm reactor (O2-MBfR) treating GW. At high LAP ($\geq$0.8 psi), the dissolved oxygen (DO) concentration inside the reactor was higher than 0.38 ± 0.02 mg/L, leading to removal efficiencies of 90%, 98%, and 80%, of total chemical oxygen demand, total linear alkylbenzene sulfonate (LAS), and total nitrogen, respectively. Lower LAP (2 pressure decreased organic biodegradation and ammoniation, and caused LAS accumulation in the biofilm, leading to the solubilization of extracellular polymeric substances and cell lysis. Comprehensive consideration of reactor performance and energy input, DO inside the MBfR at 0.38 ± 0.02 mg/L could be selected as the optimized condition for GW treatment. Microbial community analyses results also revealed that improved LAP was favorable for the enrichment of LAS-biodegradation related genus (Pseudomonas, Parvibaculum, Magnetospirillum, Clostridium, Zoogloea, Dechloromonas and Mycobacterium), nitrifiers (Nitrosomonas and Sphingomonas) and facultative microorganisms (Dechloromonas, Flavobacterium, Pseudomonas, Aeromonas and Zoogloea) that can carry out denitrification under relatively high DO conditions (>0.38 mg/L), but led to the reduction of the relative abundance of heterotrophs (Acidovorax, Thermomonas, Brevundimonas and Enterobacter) that are more sensitive towards high DO conditions. © 2021 Elsevier Ltd
Number of references: 34
Main heading: Dissolved oxygen
Controlled terms: Bacteria - Bioreactors - Atmospheric pressure - Biodegradation - Nitrogen removal - Biofilms
Uncontrolled terms: Aerobic biological treatment - Dissolved oxygen concentrations - Extra-cellular polymeric substances - Linear alkylbenzene sulfonates - Membrane biofilm reactor - Microbial communities - Microbial community analysis - Optimized conditions
Classification code: 443.1 Atmospheric Properties - 461.8 Biotechnology - 462.5 Biomaterials (including synthetics) - 801.2 Biochemistry - 802.1 Chemical Plants and Equipment
Numerical data indexing: Percentage 8.00e+01%, Percentage 9.00e+01%, Percentage 9.80e+01%
DOI: 10.1016/j.chemosphere.2021.129541
Funding Details: Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: 103-11042010013, Acronym: HZAU, Sponsor: Huazhong Agricultural University;
Funding text: This research is financially supported by the Startup Fund for Distinguished Professors of Huazhong Agricultural University to Yun Zhou (103-11042010013), and the research grants from a Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chair (IRC) Program in Sustainable Urban Water Development (Liu, Y.) through the support by EPCOR Water Services, EPCOR Drainage Operation, and the Canada Research Chair (CRC) in Future Water Services (Liu, Y.).
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Data Provider: Engineering Village
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53. Superelasticity over a wide temperature range in metastable β–Ti shape memory alloys

Accession number: 20203909225730
Authors: Xiong, Chengyang (1, 2); Li, Yan (1, 3); Zhang, Jian (4); Wang, Yu (5); Qu, Wentao (6); Ji, Yuancao (7); Cui, Lishan (8); Ren, Xiaobing (7)
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Publication year: 2021
Article number: 157090
Language: English
ISSN: 09258388
CODEN: JALCEU
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Shape memory alloys (SMAs) offer many technological advantages in various applications due to shape memory effect and superelasticity. Among them, superelasticity persists within a narrow temperature range (© 2020 Elsevier B.V.
Number of references: 48
Main heading: Titanium alloys
Controlled terms: Zircaloy - Elasticity - Glass - Glass transition - Nanotechnology - Point defects - Martensitic transformations - Martensite
Uncontrolled terms: Martensite transformations - Narrow temperature ranges - Strain glass transition - Stress-induced - Superelasticity - Temperature stress - Thermoelastic martensites - Wide temperature ranges
Classification code: 531 Metallurgy and Metallography - 531.2 Metallography - 542.3 Titanium and Alloys - 761 Nanotechnology - 802.3 Chemical Operations - 812.3 Glass - 933.1.1 Crystal Lattice
Numerical data indexing: Temperature 1.23e+02K to 3.73e+02K
DOI: 10.1016/j.jallcom.2020.157090
Funding Details: Number: 51831006, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: HBPU, Sponsor: Hubei Polytechnic University; Number: 2018YFC1106600, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: This work was supported by the National Key R&D Program of China (No. 2018YFC1106600), the National Natural Science Foundation of China (51831006) and Hubei Polytechnic University Talent Introduction Project (20xjz14R).This work was supported by the National Key R&D Program of China (No. 2018YFC1106600), the National Natural Science Foundation of China (51831006) and Hubei Polytechnic University Talent Introduction Project (20xjz14R).
Compendex references: YES
ErratuFlg: 2017526274
Database: Compendex
Data Provider: Engineering Village
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54. Effects of the support on bifunctional one-step synthesis of methylal: Via methanol oxidation catalysed by Fe-Mo-based bifunctional catalysts

Accession number: 20210209765843
Authors: Yuan, Meng (1, 4); Tang, Ruiyuan (2); Sun, Xiangyu (3); Zhang, Zhimei (1, 4); Tian, Yuanyu (1, 4, 5); Qiao, Yingyun (1, 4)
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Corresponding authors: Tian, Yuanyu; Qiao, Yingyun
Source title: Sustainable Energy and Fuels
Abbreviated source title: Sustain. Energy Fuels
Volume: 5
Issue: 1

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Publication year: 2021
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Language: English
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Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: In the one-step preparation of methylal from methanol, achieving high methanol conversion and high methylal yield is a huge challenge. To address this problem, in this study a new Fe-Mo-based catalyst was designed, and the effect of the type and amount of the support on catalytic activity was explored. The results showed that Mo:Fe(2)/HZSM-5(80 + 80), in which HZSM-5(80 + 80) was the catalytic support, had excellent catalytic performance, with the yield of methylal reaching 81.33%, much higher than other reported results of this process. Through XPS, NH3-TPD and PY-FTIR analyses it was found that the formation of Mo5+ promoted coordination of the two terminal oxygens with the Mo double bond in the Fe2(MoO4)3 octahedron, and the higher the B/L acid site ratio, the better the catalytic activity and the higher the selectivity of the target product. The apparent activation energy also further proved that Mo:Fe(2)/HZSM-5(80 + 80) was highly suitable for the one-step production of methylal from methanol. © The Royal Society of Chemistry.
Number of references: 52
Main heading: Iron compounds
Controlled terms: Activation energy - Ammonia - Catalyst activity - Methanol
Uncontrolled terms: Bi-functional - Bifunctional catalysts - Catalytic performance - Catalytic supports - Effect of the support - Methanol conversion - Methanol Oxidation - Mo-based catalysts - NH3-TPD - One step synthesis
Classification code: 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 8.133E+01%
DOI: 10.1039/d0se01194k
Funding Details: Number: YCX2020040, Acronym: CUPB, Sponsor: China University of Petroleum, Beijing; Number: ZR2017QEE006, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province; Number: SKLOP201901001, Acronym: -, Sponsor: State Key Laboratory of Heavy Oil Processing; Number: 18CX02121A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: 2018CXGC0301, Acronym: -, Sponsor: Major Scientific and Technological Innovation Project of Shandong Province;
Funding text: This study was conducted with THE National Natural Science Foundation of China (No. 21878335, 21576293 and 21576294), Major scientic and technological innovation projects in Shandong Province of China (No. 2018CXGC0301), and the Fundamental Research Funds for the Central Universities (18CX02121A), supported by the State Key Laboratory of Heavy Oil Processing (SKLOP201901001), the Postgraduate Innovation Funding Project of China University of Petroleum (East China) (YCX2020040) and the Shandong Natural Science Foundation (ZR2017QEE006).
Compendex references: YES
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55. Variations and model of the rheological parameters of low damage BCG - CO2 fracturing fluid

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Authors: Luo, Xiangrong (1); Li, Jianshan (2); Pan, Qianhong (3); Qi, Yin (2); Huang, Penggang (2); Zhang, Pengfei (4); Wang, Shuzhong (5); Ren, Xiaojuan (1)
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Corresponding authors: Luo, Xiangrong(xiangrong_luo@163.com); Wang, Shuzhong(szwang12@126.com)
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Volume: 99

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Language: English
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CODEN: CJCEA7
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Publisher: Wiley-Liss Inc.
Number of references: 48
Main heading: Fracturing fluids
Uncontrolled terms: Foam-fracturing fluids - Fracturing treatments - Heat transfer and flows - Increasing temperatures - Low permeability gas reservoirs - Quadratic polynomial - Rheological parameter - Rheological property
Classification code: 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 641.1 Thermodynamics - 641.2 Heat Transfer - 804.2 Inorganic Compounds - 921 Mathematics - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 3.32e+00%
DOI: 10.1002/cjce.23888
Funding Details: Number: 2015KTCL01#08,51741407, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Key Science and Technology Program of Shaanxi Province;
Funding text: This study was financially supported by the National Natural Science Foundation of China (No. 51741407) and Project 2015KTCL01-08 of the Shaanxi Province Science and Technology Program. The authors would like to acknowledge the Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil and Gas Reservoirs, School of Petroleum Engineering, Xi'an Shiyou University, for supporting our research.National Natural Science Foundation of China, Grant/Award Number: 51741407 Funding informationThis study was financially supported by the National Natural Science Foundation of China (No. 51741407) and Project 2015KTCL0108 of the Shaanxi Province Science and Technology Program. The authors would like to acknowledge the Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil and Gas Reservoirs, School of Petroleum Engineering, Xi'an Shiyou University, for supporting our research.
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Database: Compendex
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56. Distribution of shallow water delta sand bodies and the genesis of thick layer sand bodies of the Triassic Yanchang Formation, Longdong Area, Ordos Basin

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Title of translation:
Authors: Liu, Hanlin (1, 2); Qiu, Zhen (1); Xu, Liming (3); Wang, Fengqin (4); Tong, Qiang (5); Lin, Jiahao (6); Yin, Shuai (4); Wang, Wenqiang (7)
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Source title: Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development
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CODEN: SKYKEG
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Based on the cores from 47 wells and logging data of 130 wells, the main types of sand bodies in the shallow water delta of the Chang 82 sub-member in the Triassic Yanchang Formation, Longdong Area, Ordos Basin were comprehensively analyzed, the distribution characteristics of sand bodies more than 20 m thick were identified, and the genetic types of the thick sand bodies were sorted out. In this region, thick-bed sand bodies can be divided into two types according to the shape and position: type 1 is the sand body in wide strip and is distributed between the average high water mark and the average low water mark; type 2 is distributed on both sides of the average low water mark and is in irregular lump shape. Based on the principle of the volume distribution of sediments and the change rule of accommodation space, the genetic models of two types of thick-bed sand bodies in the Chang 82 sub-member are superimposed distributary channel sand bodies in high accommodation space and superimposed composite sand bodies in low accommodation space. © 2021, The Editorial Board of Petroleum Exploration and Development. All right reserved.
Number of references: 35
Main heading: Sand
Controlled terms: Metamorphic rocks
Uncontrolled terms: Accommodation space - Distributary channels - Distribution characteristics - Genetic models - Logging data - Shallow-water deltas - Volume distributions - Yanchang Formation
Classification code: 483.1 Soils and Soil Mechanics
Numerical data indexing: Size 2.00e+01m
DOI: 10.11698/PED.2021.01.09
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village
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57. Scaling Inhibitor Impact to Corrosion Resistance of J55 mild Steel in CO2 saturated brine (*Open Access*)

Accession number: 20211610230773
Authors: Zhang, Qingbo (1); Xu, Xiaowei (2); Hua, Xueping (2); Lei, Jianyong (2); Ma, Yun (3, 4); Yu, Qingsong (5)
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Corresponding author: Ma, Yun(23987471@qq.com)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 714
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Issue: 2
Issue title: 2020 6th International Conference on Environmental Science and Material Application - 1. Natural Resources and Environmental Science
Issue date: April 9, 2021
Publication year: 2021
Article number: 022076
Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 2020 6th International Conference on Environmental Science and Material Application, ESMA 2020
Conference date: December 19, 2020 - December 20, 2020
Conference location: Xi'an, China
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Publisher: IOP Publishing Ltd

Abstract: The corrosion behavior of the J55 mild steel alloy in CO2 saturated brine have been studied by weight loss technique, potentiodynamic polarization technique and characterization of the corroded surface techniques. The results demonstrate that the corrosion solution is easy to penetrate into the matrix and activate corrosion without scale inhibitor. When the scale inhibitor content was as high as 30 mg/L, the effect of scaling products on corrosion gradually decreased. Adding the corresponding scale inhibitor in the solution was beneficial to slow down the corrosion rate and the possibility of pitting corrosion. The corrosion product film is mainly FeCO3, and with the increase of scale inhibitor contents, the density of FeCO3 was stronger and compact, which could greatly prevent the contact between the medium and the matrix.. © Published under licence by IOP Publishing Ltd.
Number of references: 26
Main heading: Low carbon steel
Controlled terms: Carbon dioxide - Corrosion rate - Alloy steel - Steel corrosion - Corrosion resistant alloys - Corrosive effects - Iron compounds - Corrosion prevention - Corrosion resistance - Pitting
Uncontrolled terms: Corroded surface - Corrosion behavior - Corrosion product film - Potentiodynamic polarization technique - Saturated brines - Scale inhibitor - Weight loss
Classification code: 531 Metallurgy and Metallography - 531.1 Metallurgy - 539.1 Metals Corrosion - 539.2 Corrosion Protection - 545.3 Steel - 804.2 Inorganic Compounds
Numerical data indexing: Mass_Density 3.00e-02kg/m3
DOI: 10.1088/1755-1315/714/2/022076
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58. Heavy-oil recovery by combined geothermal energy and cosolvent/water flooding

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Authors: Wang, Chen (1, 2); Liu, Yueliang (3, 4); Du, Yifan (5); Gao, Yuan (1, 6); Sun, Yuanxiu (7)
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Abstract: Water flooding has been accepted as the first-hand strategy for oil recovery as well as for unconventional oil reservoir development. However, a large amount of heavy oil is generally left over after a long period of water flooding due to the figuring effect. In this work, geothermal energy and cosolvents are proposed to assist water flooding for heavy oil recovery. The influences of cosolvents and temperature on the viscosity of heavy oil is first investigated. NMR technique is then applied to investigate the performance of geothermal energy and cosolvents for enhancing heavy oil exploration. Results show that the addition of methanol and ethanol significantly decreases the viscosity of heavy oil as much as 93.95%; in addition, viscosity of heavy oil is reduced as temperature increases. Compared to water flooding, geothermal assisted water flooding recovers 28.3% more oil from the heavy-oil saturated core samples by reducing the viscosity of in-situ heavy oil. The addition of methanol and ethanol into the injected water enables the injected water to enter the smaller pores and recover more heavy oil from such pores. Thereby, the geothermal methanol- and ethanol-assisted water flooding show better performance for enhancing heavy oil exploitation than pure water flooding. © 2021 Elsevier Ltd
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Main heading: Crude oil

Controlled terms: Ethanol - Reservoirs (water) - Thermal oil recovery - Viscosity - Floods - Petroleum prospecting - Heavy oil production - Methanol - Oil well flooding - Petroleum reservoirs - Petroleum reservoir engineering
Uncontrolled terms: Cosolvents - Energy - Floodings - Heavy oil recovery - Heavy oil reservoirs - Injected water - NMR techniques - Oil recoveries - Performance - Water flooding
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 2.83E+01%, Percentage 9.395E+01%
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59. Revisiting movable fluid space in tight fine-grained reservoirs: A case study from Shahejie shale in the Bohai Bay Basin, NE China

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Authors: Huang, Hexin (1, 2); Li, Rongxi (1); Chen, Weitao (2, 3); Chen, Lei (4); Jiang, Zhenxue (2); Xiong, Fengyang (5, 6); Guan, Wen (5, 6); Zhang, Shaohua (7); Tian, Boning (8)
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Abstract: Assessment of movable fluid is a key topic in production of tight formations. Evaluation of the movable fluid was usually conducted on tight sandstone formations while rarely on black organic-rich shales. To analyze the movable fluid properties in tight black shales, we document the basic geochemical and petrological features of Paleogene Shahejie shale and carry out quantitative analyses of the movable fluid properties. A modified method is proposed to estimate the pore size distribution. Results indicate that Shahejie shale is characterized by a low porosity and under-saturated of movable fluid. Further, porosity and saturation of movable fluid in shales are mainly determined by the heterogeneity of pore structure. Besides, micropores and mesopores with pore radius smaller than 6.69–18.25 nm (the lower limits are calculated for the collected samples based on the low-field Nuclear Magnetic Resonance (LF-NMR) transverse relaxation time (T2) spectra, i.e., the lower limit is different for each sample) provide substantial movable space for the fluid. Previously, relaxation rate that related to conversion from T2 spectra of porous media to pore size distributions is often regarded as constant as well as thickness of film fluid that produces pore surface relaxation. However, our work indicates that both the relaxation rate and thickness of film fluid are variables as a function of the

pore radius. This study enriches the application of movable fluid properties in tight reservoirs formations, especially shales, and lays a foundation for tight porous media research using LF-NMR in future. © 2021 Elsevier B.V.
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Main heading: Nuclear magnetic resonance
Controlled terms: Size distribution - Mercury (metal) - Pore size - Pore structure - Shale
Uncontrolled terms: Bohai Bay Basin - Fluid property - Low field - Low-field nuclear magnetic resonance - Lower limits - Mercury intrusion porosimetry - Movable fluid - Pore radius - Pore-size distribution - Tight reservoir
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 922.2 Mathematical Statistics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Size 1.825E-08m
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60. Modeling transient flow behavior with the high velocity non-Darcy effect in composite naturally fractured-homogeneous gas reservoirs

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Authors: Nie, Ren-Shi (1); Fan, Xiaohui (1); Li, Min (1); Chen, Zhangxin (2); Deng, Qi (3); Lu, Cong (1); Zhou, Zhi-Lin (4); Jiang, De-Wei (4); Zhan, Jie (5, 6)
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Abstract: A gas reservoir with composite properties contains two distinct regions, where one develops natural fractures and the other does not. To investigate the pressure transient behavior of the non-Darcy flow in composite naturally fractured-homogeneous gas reservoirs, a radial bi-zonal composite non-Darcy flow model was developed based on Izbash's equation. The inner region was considered as a dual-porosity medium to simulate the non-Darcy flow, whereas the outer region was considered as a homogeneous medium to simulate the Darcy flow. This model was solved using the Laplace transform, linearization and Stehfest numerical inversion. Then, the standard bi-logarithmic characteristic curves of the non-Darcy flow model were plotted. The flow stages were recognized and the influence of vital characteristic parameters on the transient behavior was analyzed and discussed in detail, such as the empirical

constant, radius of the non-Darcy region, storage ratio, crossflow coefficient, etc. It is found that the values of the empirical constant n have a significant influence on the pressure transient behavior of the non-Darcy region. Moreover, three reduced models of the model proposed in this study were analyzed and discussed. Finally, it was found from the field application that this model had an excellent agreement between the measured and simulated pressure responses. The research results can be a helpful guide for researchers in the related fields when studying the transient behavior of high-velocity non-Darcy gas flow in composite naturally fractured-homogeneous gas reservoirs. © 2021 Elsevier B.V.
Number of references: 37
Main heading: Natural fractures
Controlled terms: Flow of gases - Petroleum reservoir engineering - Porosity - Petroleum reservoirs - Gases - Laplace transforms
Uncontrolled terms: Darcy-flow model - Dual porosity - Flow behaviours - Gas reservoir - High velocity - Natural fracture - Non-Darcy - Non-Darcy flow - Pressure transient - Transient behavior
Classification code: 421 Strength of Building Materials; Mechanical Properties - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 631.1.2 Gas Dynamics - 921.3 Mathematical Transformations - 931.2 Physical Properties of Gases, Liquids and Solids
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61. Water compatible supramolecular polymers: Recent progress

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Authors: Han, Weiwei (1); Xiang, Wei (1); Li, Qingyun (2); Zhang, Hanwei (2); Yang, Yabi (2); Shi, Jun (1); Ji, Yue (1); Wang, Sichang (1); Ji, Xiaofan (2); Khashab, Niveen M. (3); Sessler, Jonathan L. (4)
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Abstract: Water compatible supramolecular polymers (WCSPs) combine aqueous compatibility with the reversibility and environmental responsiveness of supramolecular polymers. WCSPs have seen application across a number of fields, including stimuli-responsive materials, healable materials, and drug delivery, and are attracting increasing attention from the design, synthesis, and materials perspectives. In this review, we summarize the chemistry of WCSPs from 2016 to mid-2021. For the sake of discussion, we divide WCSPs into five categories based on the core supramolecular approaches at play, namely hydrogen-bonding arrays, electrostatic interactions, large π–conjugated subunits, host-guest interactions, and peptide-based systems, respectively. We discuss both synthesis and polymer structure, as well as the underlying design expectations. The goal of this overview is to deepen our understanding of the strategies that have been exploited to prepare WCSPs, as well as their properties and uses. Thus, a section devoted to potential applications is included in this review. © The Royal Society of Chemistry.
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Main heading: Drug delivery
Controlled terms: Functional polymers - Drug interactions - Hydrogen bonds - Supramolecular chemistry
Uncontrolled terms: Design materials - Design synthesis - Environmental responsiveness - Host guest interactions - Host-guest peptides - Hydrogen bonding arrays - Recent progress - Stimuli-responsive materials - Stimulus-responsive materials - Supramolecular polymers
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62. Mineralogical composition and organic matter characteristics of lacustrine fine-grained volcanic-hydrothermal sedimentary rocks: A data-driven analytics for the second member of Permian Lucaogou Formation, Santanghu Basin, NW China

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Authors: Zhang, Shaohua (1, 2); Liu, Chiyang (3); Liang, Hao (4); Jia, Langbo (5); Bai, Jianke (6); Zhang, Long (1); Wang, Jianqiang (3)
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Abstract: The volcanic and/or hydrothermal activities are considered as important factors affecting the sedimentation processes of fine-grained sedimentary rocks in some cases. Recent works demonstrate that the Permian Lucaogou Formation in Santanghu Basin (NW China) was so strongly influenced by synsedimentary volcanic and hydrothermal activities that some researchers classify it as fine-grained volcanic-hydrothermal sedimentary rock. In this work, we compile mineralogical and organic geochemical data on 566 samples from 183 m continuous cores of Well L1 in Santanghu Basin and combine descriptive statistical method to dissect the second member of Permian Lucaogou Formation fine-grained volcanic-hydrothermal sedimentary rocks. The dataset shows that the second member of Lucaogou Formation lacustrine fine-grained volcanic-hydrothermal sedimentary rocks in Well L1 can be divided into three distinct intervals based on mineralogical composition and organic matter characteristics, although considerable vertical variability exists. The most striking differences in mineralogical composition among the three intervals are the vanishing of glauberite in the upper interval and the missing of plagioclase in the lower interval. Combined with published genetic mineralogy studies, the mineralogical composition dataset suggests that the second member of Lucaogou Formation in Santanghu Basin was deposited in an alkaline, reducing lake. The middle and upper intervals experienced three and two synsedimentary volcanic cycles, respectively, while lower interval was significantly influenced by hydrothermal fluid input prior to volcanic eruption. In addition, the lower and middle intervals were deposited in saline conditions, while the upper interval was deposited in freshwater conditions due to increased freshwater input. Based on the correlations analysis among the mineral contents and organic geochemical parameters, we suggest that the volcanic activity in the second member of Lucaogou formation is an important driver for the development of high-quality source rocks. By contrast, the hydrothermal activity has a dual effect on organic matter accumulation. In detail, the anoxic environments related to the hydrothermal activity is conducive to organic matter preservation, while the accompanying high-rate chemical precipitation of dolomite has an effect of dilution on organic matter accumulation. Moreover, the second member of Lucaogou Formation lacustrine fine-grained volcanic-hydrothermal sedimentary rocks in Well L1 are characterized by considerable oil generation potential and good fracability, but low oil content. This suggests that the fine-grained sedimentary rocks with good oil-generating capacity and good fracability may not guarantee the occurrence of shale oil sweet spot zone, and a comprehensive assessment in combination with oil retentive capacity is needed. © 2021 Elsevier Ltd
Number of references: 89
Main heading: Sedimentary rocks
Controlled terms: Alkalinity - Feldspar - Volcanoes - Biogeochemistry - Sedimentology - Volcanic rocks - Water - Organic compounds
Uncontrolled terms: Chemical precipitation - Comprehensive assessment - Geochemical parameters - High-quality source rocks - Hydrothermal activity - Mineralogical compositions - Organic matter preservations - Sedimentation process
Classification code: 481.1 Geology - 481.2 Geochemistry - 482.2 Minerals - 484 Seismology - 801.1 Chemistry, General - 801.2 Biochemistry - 804.1 Organic Compounds
Numerical data indexing: Size 1.83e+02m
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63. Peptide-carbon hybrid membranes for highly efficient and selective extraction of actinides from rare earth elements

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Authors: Gao, Yangyang (1); Zhang, Qian (1); Lv, Ying (2); Wang, Sheng (1); Men, Meng (3); Kobayashi, Hisayoshi (4); Xu, Zhanglian (1); Wang, Yin (5, 6)
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Abstract: It is challenging to efficiently and selectively extract actinides from rare earth elements (REEs). Here, we recovered uranium (U(vi)) and thorium (Th(iv)) from REEs using a cost-effective peptide-carbon hybrid membrane through rapid pressure-driven filtration. The incorporation of peptides and activated carbon into the membrane synergistically improves the adsorption of U(vi) and Th(iv) from REEs. The distribution coefficients (Kd) of the hybrid membrane for U(vi) and Th(iv) are 4 to 5 orders of magnitude higher than those for other REEs at pH 3.8. The saturation adsorption capacities (Qm) for U(vi) and Th(iv) are much higher than those of the previously reported adsorbents. More importantly, the hybrid membranes have the ability to reduce the concentrations of multiple heavy metal ions (HMIs) by at least 3 orders of magnitude simultaneously. All these properties would ensure the hybrid membrane with a promising future in wastewater processing. © The Royal Society of Chemistry 2021.
Number of references: 62
Main heading: Metal ions
Controlled terms: Peptides - Actinides - Heavy metals - Microfiltration - Adsorption - Membranes - Uranium compounds - Rare earth elements - Activated carbon - Cost effectiveness - Rare earths
Uncontrolled terms: Cost effective - Distribution coefficient - Hybrid membrane - Orders of magnitude - Pressure-driven - Rare earth elements (REEs) - Saturation Adsorption - Selective extraction
Classification code: 461.9 Biology - 531 Metallurgy and Metallography - 531.1 Metallurgy - 547 Minor, Precious and Rare Earth Metals and Alloys - 547.2 Rare Earth Metals - 622.1 Radioactive Materials, General - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 911.2 Industrial Economics - 951 Materials Science
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64. Defects, photophysics and passivation in Pb-based colloidal quantum dot photovoltaics

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Abstract: Colloidal quantum dots (CQDs) are a class of third-generation materials for photovoltaics (PVs) that are promising for enabling high efficiency devices with potential for exceeding the Shockley-Queisser limit. This is due to their potential to decrease thermal dissipation via multiple exciton generation during charge conversion and collection, which could potentially lead to an increase in the photovoltage or photocurrent in colloidal quantum dot photovoltaics (CQD PVs). But despite a predicted upper efficiency limit of 42%–44%, the highest power conversion efficiencies of these PVs using lead sulfide colloidal quantum dots (PbS CQDs) remains at approximately 13% on a laboratory scale. For further improvements, the fundamental recombination mechanisms need to be studied to determine their effects on the open-circuit voltage (VOC) and charge-carrier lifetime as well as the diffusion length of the carriers. Also, surface defect passivation and interface engineering should be studied. In this work, we discuss different pathways for non-radiative recombination losses in lead sulfide colloidal quantum dot photovoltaics (PbS CQD PVs), as well as the strategies for reducing these losses by the passivation of the surface and interface defects. We also discuss routes to overcome limits in the diffusion length of the carriers through the engineering of charge transport layers. This work provides routes for the fabrication of highly efficient CQD PVs. © 2020 Elsevier Ltd
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