1. Basic Characteristics and Application Progress of Supercritical Water (*Open Access*)

Accession number: 20203909221588
Authors: Zheng, Hao (1); Yu, Tao (1); Qu, Chengtun (1, 2); Li, Wanjing (1); Wang, Yanfei (1)
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Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
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Conference location: Wuhan, Hubei, China
Conference code: 162637
Publisher: IOP Publishing Ltd
Abstract: Compared with water at normal temperature and normal pressure, supercritical water had large differences and also had some unique characteristics. In this paper, some basic physical properties of supercritical water, included density, viscosity, thermal conductivity, dielectric constant, ion product, hydrogen bond, diffusion coefficient and solubility, were introduced. Some applications of supercritical water oxidation technology in waste treatment, hydrogen production by supercritical water gasification of coal and supercritical hydr thermal synthesis, were discussed. © Published under licence by IOP Publishing Ltd.
Number of references: 18
Main heading: Waste treatment
Controlled terms: Thermal conductivity - Hydrogen bonds - Hydrogen production - Water treatment
Uncontrolled terms: Application progress - Basic characteristics - Normal pressure - Supercritical - Supercritical water - Supercritical water gasification - Supercritical water oxidation - Thermal synthesis
Classification code: 445.1 Water Treatment Techniques - 452.4 Industrial Wastes Treatment and Disposal - 522 Gas Fuels - 641.1 Thermodynamics - 801.4 Physical Chemistry
DOI: 10.1088/1755-1315/555/1/012036
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

2. Superhydrophobic luminous nanocomposites from CsPbX3 perovskite nanocrystals encapsulated in organosilica

Accession number: 20201108289030
Authors: Zhou, Yajie (1); Pan, Aizhao (1); Shi, Chengyu (1); Ma, Xiaoqin (1); Jia, Mengjun (1); Huang, Hai (2); Ren, Dazhong (2); He, Ling (1)
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Source title: Applied Surface Science
Abbreviated source title: Appl Surf Sci

Volume: 515
Issue date: 15 June 2020
Publication year: 2020
Article number: 146004
Language: English
ISSN: 01694332
CODEN: ASUSEE
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: All-inorganic (CsPbX3, X = Cl, Br, I) perovskite nanocrystals (PNCs) demonstrate promising optoelectronic properties, provided their poor stabilities can be overcome. Herein, a facile in-situ encapsulating strategy is proposed to form super-hydrophobic nanocomposites (abbr. PNC@SSiP) on a large scale by incorporating CsPbBr3 NCs into organosilica nanoparticles, which reduces degradation and improves the environmental stabilities. The resulting nanocomposites demonstrated monodispersed CsPbBr3 NCs (5–6 nm) embedded homogeneously in the organosilica matrix, and a high photoluminescence quantum yield (PLQY over 50%). The PNC@SSiP exhibited extraordinary stability towards water, enhanced thermal stability and photostability. However, photoluminescent (PL) decay of less than 20% can be monitored if the PNC@SSiP nanocomposites are immersed in water for 60 days. In addition, a high static contact angle for water (152.44 ± 0.97°) further indicates excellent super-hydrophobicity of the nanocomposites. The super-hydrophobic PNC@SSiP nanocomposites can be used for fabricating luminous devices, such as white light emitting diode (WLED), further demonstrating the potential value of the obtained nanocomposites as a stable luminophore in optoelectronic applications. This novel synthesis strategy greatly widens the methods for fabricating highly stable perovskite materials in optoelectronic applications. © 2020 Elsevier B.V.
Number of references: 41
Main heading: Nanoparticles
Controlled terms: Silica - Lead compounds - Nanocrystals - Contact angle - Perovskite - Hydrophobicity - Bromine compounds - Nanocomposites
Uncontrolled terms: Environmental stability - Luminophores - Optoelectronic applications - Optoelectronic properties - Organosilicas - Photoluminescence quantum yields - Static contact angle - White light emitting diodes
Classification code: 482.2 Minerals - 761 Nanotechnology - 931.2 Physical Properties of Gases, Liquids and Solids - 933 Solid State Physics - 933.1 Crystalline Solids
Numerical data indexing: Age 1.64e-01yr, Percentage 2.00e+01%, Percentage 5.00e+01%
DOI: 10.1016/j.apsusc.2020.146004
Funding Details: Number: 2017M623149,2019T120902, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2018JQ5011, Acronym: -, Sponsor: -; Number: 51802254,51873173, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: xjj2018053, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work was primarily supported by the National Natural Science Foundation of China (NSFC Grants 51802254 , 51873173), the China Postdoctoral Science Foundation Funded Project (2017M623149 , 2019T120902), the Fundamental Research Funds for the Central Universities (xjj2018053) and Shaanxi province Youth Foundation (2018JQ5011), China. The author wish to express their gratitude to the MOE Key Laboratory for Nonequilibrium Condensed Matter and Quantum Engineering of Xi’an Jiaotong University , China.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

3. Synthesis of a novel water-based drilling fluids loss reducer (*Open Access*)

Accession number: 20201808593257
Authors: Du, Weichao (1, 2); Wang, Xiangyun (1); Zhang, Yunyue (3); Chen, Gang (1)
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Corresponding author: Du, Weichao(duweichao@xsyu.edu.cn)
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Document type: Conference article (CA)
Conference name: 2020 4th International Conference on Material Science and Technology, ICMST 2020
Conference date: January 22, 2020 - January 23, 2020
Conference location: Wuhan, Hubei, China
Conference code: 158794
Publisher: IOP Publishing Ltd
Abstract: In this paper, an inorganic/organic water-based drilling fluids reducer AM/AA/GO was prepared by using acrylamide (AM), acrylic acid (AA) and graphene oxide (GO) as raw material. Structural of AM/AA/GO was characterized via FT-IR, GPC and TGA-DSC. GPC results showed that the molecular weight of AM/AA/GO was 23503 g/mol and the TGA-DSC confirmed the excellent temperature resistance ability of AM/AA/GO.
Number of references: 10
Main heading: Amides
Controlled terms: Drilling fluids - Graphene - Infill drilling
Uncontrolled terms: Acrylamides - Acrylic acids - Inorganic/organic - Temperature resistances - Tga-dsc - Water based drilling fluids
Classification code: 511.1 Oil Field Production Operations - 761 Nanotechnology - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Molar_Mass 2.35e+04g/mol
DOI: 10.1088/1757-899X/774/1/012005
Funding Details: Number: KFKT2019-13, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China;
Funding text: The authors would like to thank the Open Fund (2018YSJS06) Key Laboratory of Metallogenic Prediction of Nonferrous Metals and Geological Environment Monitoring (Central South University), Ministry of Education; Open Fund (KFKT2019-13) of the Key Laboratory of Auxiliary Chemistry and Technology for Chemical Industry, Ministry of Education Shaanxi University of Science and Technology for their financial support.
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

4. Experimental study on high temperature regeneration of fiber Bragg grating

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Source title: Proceedings of SPIE - The International Society for Optical Engineering
Abbreviated source title: Proc SPIE Int Soc Opt Eng
Volume: 11455
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Issue title: Sixth Symposium on Novel Optoelectronic Detection Technology and Applications
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Article number: 114555H
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ISBN-13: 9781510637047
Document type: Conference article (CA)
Conference name: 6th Symposium on Novel Optoelectronic Detection Technology and Applications

Conference date: December 3, 2019 - December 5, 2019
Conference location: Beijing, China
Conference code: 162270
Sponsor: Chinese Society for Optical Engineering; Science and Technology on Low-light-level Night Vision Laboratory
Publisher: SPIE
Abstract: Regeneration of fiber Bragg gating (FBG) plays an important role in applications, it can make FBG resist high temperature for a long time, thus greatly improving the performance of FBG and meeting the measurement requirements. In this paper, the details of the regeneration of FBG is investigated based on high temperature annealing technology, and the temperature sensing performance of regenerated FBG(RFBG) is studied subsequently. Experimental results show that the regeneration of FBG can be realized by means of high temperature annealing with a certain temperature setting schedule. Compared with ordinary FBG, the reflected power of the central wavelength of RFBG fluctuates little with the change of temperature. During heating and cooling, the temperature sensitivity of the RFBG is 0.01295nm/°C and 0.01286nm/°C, respectively. The difference in temperature sensitivity is small, and the linearity is greater than 0.99. It shows that RFBG has good thermal stability in the range of room temperature# 600°C.

Number of references: 27
Main heading: Fiber Bragg gratings
Controlled terms: Annealing - Temperature sensors - High temperature applications
Uncontrolled terms: Central wavelength - Change of temperatures - Heating and cooling - High temperature - High-temperature annealing - Temperature sensing - Temperature sensitivity - Temperature setting
Classification code: 537.1 Heat Treatment Processes - 944.5 Temperature Measuring Instruments
Numerical data indexing: Temperature 8.73e+02K
DOI: 10.1117/12.2565067
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

5. Reversible and site-specific immobilization of $\beta 2$–adrenergic receptor by aptamer-directed method for receptor-drug interaction analysis

Accession number: 20201908614124
Authors: Gao, Juan (1); Chang, Zhongman (1); Tian, Rui (1); Li, Ping (1); Ahmad, Faizan (1); Jia, Xiaoni (1, 2); Liang, Qi (1, 3); Zhao, Xinfeng (1)
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Source title: Journal of Chromatography A
Abbreviated source title: J. Chromatogr. A
Volume: 1622
Issue date: 5 July 2020
Publication year: 2020
Article number: 461091
Language: English
ISSN: 00219673
E-ISSN: 18733778
CODEN: JCRAEY
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Immobilized protein makes a profound impact on the development of assays for drug discovery, diagnosis and in vivo biological interaction analysis. Traditional methods are enormously challenged by the G-protein coupled receptor ascribed to the loss of receptor functions. We introduced a $\beta 2$–adrenergic receptor ($\beta 2$–AR) aptamer into the immobilization of the receptor. This was achieved by mixing the receptor conjugated silica gel with cell lysates containing the receptor. We found that the aptamer-directed method makes immobilized $\beta 2$–AR good stability in seven days and high specificity of ligand recognition at the subtype receptor level. Feasibility of the immobilized $\beta 2$–AR in drug-receptor interaction analysis was evaluated by injection amount-dependent method, nonlinear chromatography, and peak decay analysis. Salbutamol, methoxyphenamine, ephedrine hydrochloride, clorprenaline, tulobuterol, bambuterol, propranolol and ICI 118551 bound to the receptor through one type of binding sites. The association

constants presented good agreement within the three methods but exhibited clear differences from the data by radio-ligand binding assay. Regarding these results, we concluded that the aptamer-directed method will probably become an alternative for reversible and site-specific immobilization of GPCRs directly from complex matrices; the immobilized receptor is qualitative for drug-receptor interaction analysis. © 2020 Elsevier B.V.
Number of references: 35
Main heading: Silica gel
Controlled terms: Ligands - Proteins - Drug interactions - Binding sites
Uncontrolled terms: Adrenergic receptors - Association constant - Biological interactions - Drug-receptor interactions - G protein coupled receptors - Immobilized receptors - Interaction analysis - Non-linear chromatography
Classification code: 461.6 Medicine and Pharmacology - 801.2 Biochemistry - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.1 Organic Compounds
DOI: 10.1016/j.chroma.2020.461091
Funding Details: Number: 21775119, Acronym: -, Sponsor: -; Number: 2020ZDLSF05-07, Acronym: -, Sponsor: -;
Funding text: This work was supported by the National Natural Sciences Foundation of China (Nos. 21775119, 21705126 and 21974107) and the Key Research and Development Project of Shaanxi Province (2020ZDLSF05-07).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

6. Function-switchable metal/semiconductor junction enables efficient photocatalytic overall water splitting with selective water oxidation products (*Open Access*)

Accession number: 20202008649668
Authors: Wei, Daixing (1); Tan, Yubo (1); Wang, Yiqing (1); Kong, Tingting (2); Shen, Shaohua (1); Mao, Samuel S. (3)
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Corresponding author: Shen, Shaohua(shshen_xjtu@mail.xjtu.edu.cn)
Source title: Science Bulletin
Abbreviated source title: Sci. Bull.
Volume: 65
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Issue date: 30 August 2020
Publication year: 2020
Pages: 1389-1395
Language: English
ISSN: 20959273
E-ISSN: 20959281
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: A novel metal/semiconductor photocatalyst, Cu nanoparticles (NPs) modified TiO2 hollow spheres (Cu/TiO2), was designed for efficient photocatalytic overall water splitting (POWS) under both ultraviolet (UV) and visible (Vis) light. This Cu/TiO2 photocatalyst possesses excellent POWS performance under Vis light at the highest level among the reported TiO2-based photocatalysts. Interestingly, the metal/semiconductor junction formed between Cu and TiO2 enables controlled water-oxidation product selectivity (H2O2 or O2) via different reaction pathways regulated by irradiation wavelengths. Under UV light, the electrons excited in TiO2 are captured by Cu NPs through the Cu/TiO2 Schottky interface for H2 production, with the photoholes in TiO2 producing H2O2 through a two-electron process; whilst under Vis light, Cu NPs act as plasmon to inject hot electrons to TiO2 for H2 production, while O2 is produced by hot holes on Cu NPs via a four-electron process. This rational design of function-switchable metal/semiconductor junction may be helpful to understand the mechanisms for POWS with desired gas/liquid water-oxidation products. © 2020 Science China Press
Number of references: 55
Main heading: Titanium dioxide
Controlled terms: Rational functions - Titanium - Copper - Product design - Photocatalytic activity - Oxidation - Semiconductor junctions - Electrons - Metal nanoparticles - Hot electrons - Hydrogen production

Uncontrolled terms: Controlled waters - Cu nano-particles - Four-electron process - Irradiation wavelength - Rational design - Reaction pathways - TiO2-based photocatalysts - Two-electron process
Classification code: 522 Gas Fuels - 542.3 Titanium and Alloys - 544.1 Copper - 701.1 Electricity: Basic Concepts and Phenomena - 714.2 Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 913.1 Production Engineering - 921 Mathematics
DOI: 10.1016/j.scib.2020.04.042
Funding Details: Number: 21875183,51672210, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018M640981, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2018JQ2028, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2017YFE0193900, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China; Number: -, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: -, Acronym: -, Sponsor: National Program for Support of Top-notch Young Professionals;
Funding text: This work was supported by the National Natural Science Foundation of China (51672210 and 21875183), the National Key Research and Development Program of China (2017YFE0193900), National Program for Support of Top-notch Young Professionals, Fundamental Research Funds for the Central Universities, Natural Science Basic Research Plan in Shaanxi Province of China (2018JQ2028), and China Postdoctoral Science Foundation (2018M640981). Daixing Wei, Yubo Tan and Tingting Kong carried out the sample synthesis, characterizations and photocatalysis measurements. Yiqing Wang carried out the first-principles density functional theory calculations. Daixing Wei and Shaohua Shen wrote the paper. Shaohua Shen and Samuel S. Mao conceived the idea and supervised the project. All the authors discussed the results and commented on the manuscript.This work was supported by the National Natural Science Foundation of China (51672210 and 21875183), National Key Research and Development Program of China (2017YFE0193900), National Program for Support of Top-notch Young Professionals, Fundamental Research Funds for the Central Universities , Natural Science Basic Research Plan in Shaanxi Province of China (2018JQ2028), and China Postdoctoral Science Foundation (2018M640981).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

7. Suppressing intrinsic self-doping of CsPbIBr2films for high-performance all-inorganic, carbon-based perovskite solar cells

Accession number: 20203609132625
Authors: Zhang, Zeyang (1); He, Fengqin (1, 3); Zhu, Weidong (1); Chen, Dandan (2); Chai, Wenming (1); Chen, Dazheng (1); Xi, He (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: Sustainable Energy and Fuels
Abbreviated source title: Sustain. Energy Fuels
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Issue: 9
Issue date: September 2020
Publication year: 2020
Pages: 4506-4515
Language: English
E-ISSN: 23984902
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: CsPbIBr2 is promising for all-inorganic, carbon-based perovskite solar cells (PSCs), owing to its quite balanced bandgap and stability characteristics. However, the serious self-doping phenomenon in one-step solution-processed CsPbIBr2 films that causes decreased built-in potentials (Vbis) and intensified carrier recombination hinders further performance optimization of the resulting PSCs. Herein, we demonstrate that such an obstacle can be overcome through rationally tailoring CsPbIBr2 precursor stoichiometry. Experimental results consistently show that a PbBr2-rich precursor tends to reinforce self-doping in the CsPbIBr2 film, while a CsI-rich one helps to weaken it. Thus, CsPbIBr2 films with a much lower self-doping level are achieved based on the CsI-rich precursor with an

optimized CsI/PbBr2 stoichiometric ratio of 1.1 : 1.0. The films possess a pure phase, much fewer compositional defects, and increased work function, resulting in suppressed carrier recombination and extended Vbi of the final PSCs. Consequently, their average efficiency is boosted to (9.92 ± 0.56)%, far exceeding those of films fabricated with a stoichiometric precursor with the value of (8.32 ± 0.61)%. Particularly, the champion CsPbIBr2 PSC delivers a superior efficiency of 10.48% and an outstanding photovoltage of 1.32 V. This work represents a major leap for CsPbIBr2 PSCs and paves the way for their further exploration to achieve better performance. © 2020 The Royal Society of Chemistry.
Number of references: 56
Main heading: Bromine compounds
Controlled terms: Semiconductor doping - Carbon - Lead compounds - Iodine compounds - Efficiency - Perovskite solar cells - Cesium iodide - Perovskite
Uncontrolled terms: Average efficiencies - Built-in potential - Carrier recombination - Compositional defects - Performance optimizations - Photo-voltage - Solution-processed - Stoichiometric ratio
Classification code: 482.2 Minerals - 702.3 Solar Cells - 712.1 Semiconducting Materials - 804 Chemical Products Generally - 913.1 Production Engineering
Numerical data indexing: Percentage 1.05e+01%, Voltage 1.32e+00V
DOI: 10.1039/d0se00774a
Funding Details: Number: 61704128,61804113,61874083,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019M663628, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: JB181107,JBX171103, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: All the authors gratefully acknowledge the nancial support from the National Natural Science Foundation of China (61804113, 61874083, and 61704128), the 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 Fundamental Research Funds for the Central Universities (JB181107 and JBX171103).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

8. Greywater treatment using an oxygen-based membrane biofilm reactor: Formation of dynamic multifunctional biofilm for organics and nitrogen removal

Accession number: 20200207994803
Authors: Zhou, Yun (1, 2); Li, Ran (1, 2); Guo, Bing (2); Zhang, Lei (2); Zou, Xin (2); Xia, Siqing (3); Liu, Yang (1, 2)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an 710065; Shaanxi Province, China; (2) University of Alberta, Department of Civil and Environmental Engineering, Edmonton; Alberta; T6G 1H9, Canada; (3) State Key Laboratory of Pollution Control and Resource Reuse, College of Environmental Science and Engineering, Tongji University, Shanghai; 200092, China
Corresponding author: Liu, Yang(yang.liu@ualberta.ca)
Source title: Chemical Engineering Journal
Abbreviated source title: Chem. Eng. J.
Volume: 386
Issue date: 15 April 2020
Publication year: 2020
Article number: 123989
Language: English
ISSN: 13858947
CODEN: CMEJAJ
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: A bench-scale oxygen-based membrane biofilm reactor (O2-MBfR) was used to treat greywater for organics and nitrogen removal. Highly dynamic multifunctional biofilm formed on fiber surfaces of the O2-MBfR. With an organics loading up to 4.26 g COD/m2-day, the MBfR successfully achieved simultaneous organics and nitrogen reduction, with average removal ratios of 95% for total chemical oxygen demand (TCOD), 98% for linear alkylbenzene sulfonates (LAS), and 99% for inorganic nitrogen (InON). Increasing feed loading rates led to the gradually decrease of dissolved oxygen (DO) concentration from 1.67 to 0.37 mg/L in the reactor, inducing the formation of complex biofilm containing distinct aerobic, aerobic-anoxic, and aerobic-anoxic-anaerobic layers; these all contributed to the

simultaneous removal of both organics and nitrogen in MBfR. Mechanisms of organics and nitrogen removal included nitrification and aerobic denitrification in aerobic biofilm, partial nitrification in the aerobic-anoxic biofilm, and partial nitrification and anaerobic denitrification in the aerobic-anoxic-anaerobic biofilm due to the co-existence of multifarious functional microorganisms in the O2-MBfR. This study lays the foundation of process optimization and cost-cutting for the practical application of O2-MBfR for greywater treatment. © 2020 Elsevier B.V.
Number of references: 47
Main heading: Biofilms
Controlled terms: Nitrogen removal - Optimization - Bioreactors - Dissolved oxygen - Denitrification - Chemical oxygen demand - Nitrification
Uncontrolled terms: Aerobic denitrification - Dissolved oxygen concentrations - Greywater - Linear alkylbenzene sulfonates - Membrane biofilm reactor - Organics and nitrogen removals - Partial nitrification - Simultaneous removal
Classification code: 461.8 Biotechnology - 462.5 Biomaterials (including synthetics) - 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 921.5 Optimization Techniques
Numerical data indexing: Mass_Density 1.67e-03kg/m3 to 3.70e-04kg/m3, Percentage 9.50e+01%, Percentage 9.80e+01%, Percentage 9.90e+01%
DOI: 10.1016/j.cej.2019.123989
Funding Details: Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: IRC, Acronym: -, Sponsor: -; Number: CRD, Acronym: -, Sponsor: Research and Development; Number: CRC, Acronym: -, Sponsor: Canada Research Chairs;
Funding text: The authors acknowledge the financial support for this project provided by research grants from a Natural Sciences and Engineering Research Council of Canada , Canada (NSERC) collaborative research and development (CRD) project, Strategic Partnership Grants, an NSERC Industrial Research Chair (IRC) Program in Sustainable Urban Water Development (Liu, Y.) through the support by EPCOR Water Services, Canada, EPCOR Drainage Operation, Canada, Alberta Innovates, Canada, and WaterWerx, Canada, and the Canada Research Chair (CRC) in Future Community Water Services (Liu, Y.). Appendix A
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

9. Competitive adsorption characteristics of CH4/C2H6 gas mixtures on model substances, coal and shale

Accession number: 20203008970303
Authors: Liu, Peng (1); Wang, Xiaofeng (1); Li, Xiaofu (1); Zhang, Ting (2); Du, Guichao (3); Liu, Wenhui (1)
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Corresponding author: Wang, Xiaofeng(wangxf@nwu.edu.cn)
Source title: Fuel
Abbreviated source title: Fuel
Volume: 279
Issue date: 1 November 2020
Publication year: 2020
Article number: 118038
Language: English
ISSN: 00162361
CODEN: FUELAC
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Dynamic adsorption experiments were conducted on different samples to investigate the process and mechanism of competitive adsorption between CH4 and C2H6 molecules. Based on adsorption breakthrough curves obtained from adsorption experiments, mathematical models of the adsorption process were established and related adsorption parameters were calculated. The results show that competitive adsorption between CH4 and C2H6 molecules on adsorption materials can occur when adsorption materials have a significantly greater adsorption capacity of C2H6 than that of CH4. Meanwhile, fitted Yoon and Nelson model indicates different adsorption rate constants in CH4 and C2H6. Generally, samples with competitive adsorption characteristics, including 5 Å molecular

sieve, 13X molecular sieve, activated carbon and shale, are characterized by obvious higher adsorption rate constant of CH4 than that of C2H6. Whereas, samples with no competitive adsorption characteristics, including 3 Å molecular sieve and coal, are characterized by almost same adsorption rate constants. The significantly greater adsorption capacity of C2H6 than that of CH4 and obvious higher adsorption rate constant of CH4 than that of C2H6 for samples in this study may result from a stronger induced force and dispersion force of C2H6 with adsorbent compared with CH4 in existing of metal ion. During the increasing maturity stage of kerogen, competitive adsorption of methane and ethane can obviously influence the gas composition in free gas at relatively low maturity stage and such influence becomes weaker at higher maturity stage. © 2020 Elsevier Ltd
Number of references: 42
Main heading: Molecular sieves
Controlled terms: Adsorption - Molecules - Sieves - Metals - Rate constants - Shale - Activated carbon - Dispersions - Gas mixtures - Metal ions
Uncontrolled terms: 13X molecular sieve - Adsorption breakthroughs - Adsorption capacities - Adsorption experiment - Adsorption materials - Adsorption parameters - Adsorption process - Competitive adsorption
Classification code: 531.1 Metallurgy - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 931.3 Atomic and Molecular Physics - 951 Materials Science
Numerical data indexing: Size 3.00e-10m, Size 5.00e-10m
DOI: 10.1016/j.fuel.2020.118038
Funding Details: Number: 41930426,41972134, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This study was supported by the National Natural Science Foundation of China (Grant Nos. 41972134 and 41930426).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

10. Recycling of FTO/TiO2 Substrates: Route toward Simultaneously High-Performance and Cost-Efficient Carbon-Based, All-Inorganic CsPbIBr2 Solar Cells

Accession number: 20200508110374
Authors: Zhu, Weidong (1); Chai, Wenming (1); Chen, Dandan (2); Xi, He (1, 3); Chen, Dazheng (1); Chang, Jingjing (1); Zhang, Jincheng (1); Zhang, Chunfu (1); Hao, Yue (1)
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Corresponding author: Zhu, Weidong(wdzhu@xidian.edu)
Source title: ACS Applied Materials and Interfaces
Abbreviated source title: ACS Appl. Mater. Interfaces
Volume: 12
Issue: 4
Issue date: January 29, 2020
Publication year: 2020
Pages: 4549-4557
Language: English
ISSN: 19448244
E-ISSN: 19448252
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Carbon-based, all-inorganic perovskite solar cells (PSCs) have drawn enormous attention recently on account of their ungraded stability and reduced costs. However, their power conversion efficiencies (PCEs) still lag behind the ones with conventional architecture. Moreover, the high cost of FTO substrates and energy-consuming sintering process of TiO2 electron-transporting layers should be further addressed. Herein, it is demonstrated that the FTO/TiO2 substrates could be separated simply from degraded CsPbIBr2 PSCs for fabricating the new ones again, which thus reduces the production costs of resulting PSCs and makes them renewable and sustainable. Meanwhile, the characterization results reveal that there are some residual CsPbIBr2-derived species on recycled FTO/TiO2 substrates, which enable the upper CsPbIBr2 films with suppressed halide phase separation and reduced defects, the diminished work function of TiO2 layers from 4.13 to 3.89 eV, along with decreased conduction band minimum

(CBM) difference of CsPbIBr2/TiO2 interface from 0.51 to 0.36 eV. Consequently, the average PCE of CsPbIBr2 PSCs is improved by 20%, from 6.51 ± 0.62% to 8.14 ± 0.63%, wherein the champion one yields the exceptional value of 9.12%. These findings provide an avenue for simultaneous performance enhancement and cost-saving of carbon-based, all-inorganic PSCs to promote their commercialization. Copyright © 2020 American Chemical Society.
Number of references: 60
Main heading: Perovskite solar cells
Controlled terms: Cost reduction - Bromine compounds - Perovskite - Titanium dioxide - Cell engineering - Lead compounds - Phase separation - Recycling - Carbon - Sintering
Uncontrolled terms: Conduction-band minimum - CsPbIBr2 - Electron transporting layer - Performance enhancements - Power conversion efficiencies - Recycled substrates - Sintering process - Sustainable energy
Classification code: 452.3 Industrial Wastes - 461.1 Biomedical Engineering - 482.2 Minerals - 641.1 Thermodynamics - 702.3 Solar Cells - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Electron_Volt 4.13e+00eV to 3.89e+00eV, Electron_Volt 5.10e-01eV to 3.60e-01eV, Percentage 2.00e+01%, Percentage 9.12e+00%
DOI: 10.1021/acsami.9b21331
Funding Details: Number: 61704128,61804113,61874083,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: All of the authors gratefully acknowledge the financial support from the National Natural Science Foundation of China (61804113, 61704128, and 61874083), the Initiative Postdocs Supporting Program of China (BX20190261), and the National Natural Science Foundation of Shaanxi Province (2018ZDCXL-GY-08-02-02 and 2017JM6049).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

11. A new method for identifying fractures in tight sandstone of a gentle structural area using well logs (*Open Access*)

Accession number: 20203008981844
Authors: Guo, Qing (1); Wang, Xuanyi (2, 3); Qu, Le (4)
Author affiliation: (1) Changqing Branch of Geophysical Research Institute, BGP, CNPC, Xi'an, China; (2) Oil and Gas Technology Institute of Changqing Oilfield Branch Company, PetroChina, Xi'an, China; (3) China and National Engineering Laboratory of Low Permeability Oil & Gas Fields Exploration and Development, Xi'an, China; (4) Post-Doctoral Contribution Center, College of Petroleum Engineering, Xi'an Shiyou University, Xi'an, China
Corresponding authors: Wang, Xuanyi(guoqing2011@cnpc.com.cn); Wang, Xuanyi(guoqing2011@cnpc.com.cn)
Source title: Energy Science and Engineering
Abbreviated source title: Energy Sci. Eng.
Volume: 8
Issue: 11
Issue date: November 2020
Publication year: 2020
Pages: 3909-3924
Language: English
E-ISSN: 20500505
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: In this paper, we conducted a systematic study on the development characteristics and logging prediction of fractures of the Upper Paleozoic tight gas sandstone reservoirs in the eastern Ordos Basin. A new fracture prediction method was proposed based on the variable scale fracture probabilistic model. The calculation steps of this method were as follows: First, the sensitivity of each conventional log series to the tight sandstone fractures was analyzed. It was found that acoustic time difference (AC), density (DEN), natural gamma ray (GR), and deep investigate double lateral resistivity (RD) have good log responses to fractures. Then, the ratio of the range (R) to the standard deviation (S) of the log data was obtained. Finally, the second derivatives of the log series AC, DEN, GR, and RD were calculated, and a new fracture index was constructed (integrated second derivative, FC) using the multiple regression method. The fracture recognition rates of this method are distributed in 64.3%-85.7%. Therefore, the constructed integrated second derivative (FC) based on conventional logs is effective to quantitatively characterize the fracture

development of tight sandstone. © 2020 The Authors. Energy Science & Engineering published by Society of Chemical Industry and John Wiley & Sons Ltd
Number of references: 59
Main heading: Fracture
Controlled terms: Well logging - Sandstone - Tight gas - Metamorphic rocks - Gamma rays - Regression analysis
Uncontrolled terms: Development characteristics - Fracture prediction - Logging prediction - Multiple regression methods - Probabilistic modeling - Second derivatives - Standard deviation - Tight gas sandstone reservoirs
Classification code: 482.2 Minerals - 512.2 Natural Gas Deposits - 522 Gas Fuels - 922.2 Mathematical Statistics - 931.3 Atomic and Molecular Physics - 932.1 High Energy Physics - 951 Materials Science
Numerical data indexing: Percentage 6.43e+01% to 8.57e+01%
DOI: 10.1002/ese3.786
Funding Details: Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2019JQ#407, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was financially supported by the Open Fund (PLC20190702) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology) and the Natural Science Basic Research Plan in Shaanxi Province of China (2019JQ-407).This work was financially supported by the Open Fund (PLC20190702) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology) and the Natural Science Basic Research Plan in Shaanxi Province of China (2019JQ407).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

12. Treatment of grey water (GW) with high linear alkylbenzene sulfonates (LAS) content and carbon/nitrogen (C/N) ratio in an oxygen-based membrane biofilm reactor (O2-MBfR)

Accession number: 20202508843419
Authors: Zhou, Yun (1); Guo, Bing (1); Li, Ran (2); Zhang, Lei (1); Xia, Siqing (3); Liu, Yang (1)
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Corresponding author: Liu, Yang(yang.liu@ualberta.ca)
Source title: Chemosphere
Abbreviated source title: Chemosphere
Volume: 258
Issue date: November 2020
Publication year: 2020
Article number: 127363
Language: English
ISSN: 00456535
E-ISSN: 18791298
CODEN: CMSHAF
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Grey water (GW) containing high levels of linear alkylbenzene sulfonates (LAS) can be a threat to the human health and organisms in the environment if not treated properly. Although aerobic treatment may achieve high GW treatment efficacy, conventional aeration can lead to serious foaming. Here, we firstly and systematically evaluated an oxygen-based membrane biofilm reactor (O2-MBfR) for its capacity to simultaneous remove organics and nitrogen from greywater with high LAS levels and carbon/nitrogen (C/N) ratios. After a five-day startup period, multifarious microorganisms formed multifunctional biofilms and the MBfR achieved high removal rates of chemical oxygen demand (COD), LAS, and total nitrogen (TN) of 88.4%, 95.6%, and 80%, respectively, with a hydraulic retention time of 7.86 h. Higher organics loading (5.53 g TCOD/m2-day) caused cell lysis and damaged the O2-MBfR system, leading to a discernible and continuous decline of the reactor performance. The O2-MBfR design completely eliminated foaming formation. LAS -biodegrading-rich genus containing Clostridium, Parvibaculum, Dechloromonas, Desulfovibrio, Mycobacterium, Pseudomonas, and Zoogloea enable the nearly complete removal of LAS even under high C/N

conditions. Results demonstrated that the O2-MBfR technology is feasible for treating GW containing high LAS and C/N ratio, while remaining free of foaming formation, and at a low cost due to high O2 utilization rates. © 2020 Elsevier Ltd
Number of references: 46
Main heading: Biofilms
Controlled terms: Oxygen - Nitrogen - Bioreactors - Carbon - Nitrogen removal - Water treatment - Chemical oxygen demand - Health risks
Uncontrolled terms: Aerobic treatment - High removal rates - Hydraulic retention time - Linear alkylbenzene sulfonates - Membrane biofilm reactor - Reactor performance - Total nitrogen - Utilization rates
Classification code: 445.1 Water Treatment Techniques - 461.7 Health Care - 461.8 Biotechnology - 462.5 Biomaterials (including synthetics) - 802.1 Chemical Plants and Equipment - 804 Chemical Products Generally
Numerical data indexing: Percentage 8.00e+01%, Percentage 8.84e+01%, Percentage 9.56e+01%, Time 2.83e+04s
DOI: 10.1016/j.chemosphere.2020.127363
Funding Details: Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: -, Acronym: -, Sponsor: Alberta Innovates; Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada;
Funding text: The authors acknowledge the financial support for this project provided by 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 Alberta Innovates , and the Canada Research Chair (CRC) in Future Community Water Services (Liu, Y.).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

13. Electrical responses and classification of complex water-flooded layers in carbonate reservoirs: A case study of Zananor Oilfield, Kazakhstan

Accession number: 20205309705613
Title of translation: -
Authors: Wang, Fei (1); Bian, Huiyuan (2); Zhao, Lun (3); Yu, Jun (3); Tan, Chengqian (4)
Author affiliation: (1) College of Geology Engineering and Geomatics, Chang'an University, Xi'an; 710064, China; (2) College of Geology & Environment, Xi'an University of Science and Technology, Xi'an; 710054, China; (3) Research Institute of Petroleum Exploration & Development, PetroChina, Beijing; 100083, China; (4) College of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development
Abbreviated source title: Shiyou Kantan Yu Kaifa
Volume: 47
Issue: 6
Issue date: December 23, 2020
Publication year: 2020
Pages: 1205-1211
Language: Chinese
ISSN: 10000747
CODEN: SKYKEG
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Experiments of electrical responses of waterflooded layers were carried out on porous, fractured, porous-fractured and composite cores taken from carbonate reservoirs in the Zananor Oilfield, Kazakhstan to find out the effects of injected water salinity on electrical responses of carbonate reservoirs. On the basis of the experimental results and the mathematical model of calculating oil-water relative permeability of porous reservoirs by resistivity and the relative permeability model of two-phase flow in fractured reservoirs, the classification standards of water-flooded layers suitable for carbonate reservoirs with complex pore structure were established. The results show that the salinity of injected water is the main factor affecting the resistivity of carbonate reservoir. When low salinity water (fresh water) is injected, the relationship curve between resistivity and water saturation is U-shaped. When high salinity water (salt water) is injected, the curve is L-shaped. The classification criteria of water-flooded layers for carbonate reservoirs are as follows: (1) In porous reservoirs, the water cut (fw) is less than or equal to 5% in oil layers, 5%-20% in weak water-flooded layers, 20%-50% in moderately water-flooded layers, and greater than 50% in strong water-flooded layers. (2) For fractured, porous-fractured and composite reservoirs, the oil layers, weakly water-flooded layers, moderately water-

flooded layers, and severely water-flooded layers have a water content of less than or equal to 5%, 5% and 10%, 10% to 50%, and larger than 50% respectively.
Number of references: 20
Main heading: Floods
Controlled terms: Petroleum reservoirs - Reservoirs (water) - Oil well flooding - Two phase flow - Fracture - Pore structure - Carbonation - Petroleum reservoir engineering
Uncontrolled terms: Carbonate reservoir - Classification criterion - Classification standard - Composite reservoirs - Electrical response - Fractured reservoir - Relative permeability - Relative permeability model
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 802.2 Chemical Reactions - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 1.00e+01% to 5.00e+01%, Percentage 2.00e+01% to 5.00e+01%, Percentage 5.00e+00% to 2.00e+01%, Percentage 5.00e+00%, Percentage 5.00e+01%
DOI: 10.11698/PED.2020.06.13
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

14. Solving the problem of data transmission while drilling based on underwater acoustic communication principle

Accession number: 20201108299330
Title of translation:
Authors: Geng, Yanfeng (1); Jia, Mengzhi (1); Zheng, Zhong (1); Yan, Hongliang (1, 2); Yue, Yaobin (1, 3); Li, Fang (1)
Author affiliation: (1) College of Control Science and Engineering in China University of Petroleum (East China), Qingdao; 266580, China; (2) Key Laboratory of Drilling Rigs Controlling Technique of Shaanxi Province, Xi'an Shiyou University, Xi'an; 710065, China; (3) College of Automation and Electronic Engineering, Qingdao University of Science and Technology, Qingdao; 266042, China
Source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)
Abbreviated source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)
Volume: 44
Issue: 1
Issue date: February 20, 2020
Publication year: 2020
Pages: 53-60
Language: Chinese
ISSN: 16735005
Document type: Journal article (JA)
Publisher: University of Petroleum, China
Abstract: After a brief introduction of measurement-while-drilling (MWD) and available wireless MWD technology, a new proposal was put forward to solve the problems of high-speed data transmission while drilling based on underwater acoustic communication principles. Firstly, drilling fluid in the pipe was selected as the communication channel, which was simplified to a one-dimensional, finite length, uniform, equal section waveguide. Based on the basic equation for small amplitude waves of ideal fluid, several properties of the channel were discussed, including the cut-off frequency of mud channel, the effect of viscous force and nonlinear factors.This lays a foundation for the parameters determination of MWD system, such as acoustic carrier frequency, required power and attainable distance. A proposal of creating a piecewise, time-varying, distributed model for real-time channel was then presented to simulate the channel properties of data transmission, which adapts to variations of drilling fluid channel, such as the increase of drilling depth, the variation and displacement of fluid density and viscosity with increasing borehole temperature and pressure.. Thirdly the attenuation results of acoustic signal in mud channel with water-based and oil-based drilling fluid were calculated, and the methods of enhancing acoustic source power and improving sink detection sensitivity based on phased array were explained. All of the results show that this proposal is feasible, and a breakthrough of MWD technology is expected to be made which solves the problem of MWD thoroughly. The optional low frequency limit is greater than 2 kHz based on the existing drilling engineering parameters, far beyond the range of process noise and therefore favorable for useful signal extraction. This makes the minimum communication

requirement and makes it possible for drilling longer than 3000 meters based on existing acoustic transducers and sensors.
Number of references: 20
Main heading: Infill drilling
Controlled terms: Underwater acoustic communication - Underwater acoustics - Acoustic transducers - Nonlinear equations - Data transfer - Drilling fluids
Uncontrolled terms: Detection sensitivity - High-speed data transmission - Measurement while drillings - Mud channel - Oil-based drilling fluid - Parameters determination - Underwater acoustic communications - Underwater acoustic data
Classification code: 511.1 Oil Field Production Operations - 675 Marine Engineering - 751.1 Acoustic Waves - 752.1 Acoustic Devices
Numerical data indexing: Frequency 2.00e+03Hz, Size 3.00e+03m
DOI: 10.3969/j.issn.1673-5005.2020.01.006
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

15. Supercritical water gasification of oily sludge to produce hydrogen based on uniform design method

Accession number: 20203909230925
Title of translation:
Authors: Jiang, Huayi (1, 2); Duan, Yuanwang (1); Wang, Yulong (1, 2, 3); Zou, Shaojie (1); Zhang, Lanxin (1); Li, Jin (1); Wang, Bing (4)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs, Xi'an; Shaanxi; 710065, China; (3) School of Energy and Power Engineering, Xi'an Jiaotong University, Xi'an; Shaanxi; 710049, China; (4) Heiyoushan Limited Liability Company of Xinjiang Oilfield Company, Karamay; Xinjiang; 834000, China
Corresponding author: Wang, Yulong(wangyl@xsyu.edu.cn)
Source title: Huagong Jinzhan/Chemical Industry and Engineering Progress
Abbreviated source title: Huagong Jinzhan/Chem. Ind. Eng. Prog.
Volume: 39
Issue: 9
Issue date: September 5, 2020
Publication year: 2020
Pages: 3819-3825
Language: Chinese
ISSN: 10006613
Document type: Journal article (JA)
Publisher: Materials China
Abstract: A large amount of oily sludge will be produced during crude oil production and transportation. Traditional methods for treatment of oily sludge have the disadvantages of low recovery efficiency and risk of secondary pollution. The supercritical water gasification of oily sludge for hydrogen energy recovery is of great significance for the efficient treatment and utilization of oily sludge. In this study, a uniform design method was used to investigate the relationship between the reaction temperature, reaction pressure, reaction time, material ratio and the hydrogen production, and the empirical formula was fitted by applying the reaction results. The influence of reaction parameters of supercritical water on hydrogen production from oily sludge was analyzed. The results showed that the multivariate linear fitting through uniform design had good feasibility in oily sludge gasification experiments. The fitted empirical formula gained good predictability. The hydrogen production per unit sludge was positively related with the reaction temperature and the reaction time, but had a negative correlation with the material ratio. With the increase of pressure, the hydrogen production per unit sludge increased first and then decreased. In the conditions of reaction parameters of 544, 2.2MPa, 150min, and 10%, respectively, the maximum hydrogen production per unit sludge achieved was 5.92mmol/g.
Number of references: 19
Main heading: Hydrogen production
Controlled terms: Design - Gasification - Petroleum transportation
Uncontrolled terms: Design method - Empirical formulas - Oily sludges - Optimal reaction parameter - Per unit - Reaction parameters - Reaction temperature - Supercritical water - Supercritical water gasification - Uniform design

Classification code: 522 Gas Fuels - 802.3 Chemical Operations
Numerical data indexing: Molar concentration 5.92E+00mol/m3, Percentage 1.00E+01%, Pressure 2.20E+06Pa, Time 9.00E+03s
DOI: 10.16085/j.issn.1000-6613.2019-1950
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

16. Failure analysis of crankshaft of fracturing pump

Accession number: 20200308043489
Authors: Wang, Hang (1, 2); Yang, Shangyu (1, 2); Han, Lihong (1, 2); Fan, Heng (3); Jiang, Qingfeng (4)
Author affiliation: (1) Tubular Goods Research Institute of CNPC, Xi'an 710077; Shaanxi, China; (2) State Key Laboratory of Performance and Structural Safety for Petroleum Tubular- Goods and Equipment Materials, Xi'an 710077; Shaanxi, China; (3) School of Electronic Engineering, Xi'an Shiyou University, Xi'an 710048; Shaanxi, China; (4) Sichuan Baoshi Machinery Special Vehicle Co., Ltd, Guanghan 618000; Sichuan, China
Corresponding author: Wang, Hang(wanghang008@cnpc.com.cn)
Source title: Engineering Failure Analysis
Abbreviated source title: Eng. Fail. Anal.
Volume: 109
Issue date: January 2020
Publication year: 2020
Article number: 104378
Language: English
ISSN: 13506307
CODEN: EFANEM
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Factory fracturing is characterized by high pressure, large discharge capacity and long-time service for shale gas well, then unite of fracturing pump operates under more severe condition with complex load and corrosion. Failure analysis was performed for crankshaft via theoretical calculation, finite element modelling and fractographic observation in fracturing pump with model QWS-2800. The results indicated that fatigue fracture was the dominant failure mechanism, with evidence of beach and striation marks and multiple fatigue cracks. The fracture plane had nearly 45° inclination with respect to the shaft axis. The main cause of insufficient fatigue strength was due to absence of surface hardening treatment. Fillet radius was a main factor for fatigue crack initiation, the fatigue crack mostly located in the thread root of radial oil-hole. Finite element analysis results indicated that the stress increased remarkably as fillet radius decreased. Then stress concentration became much higher with the transition of thread root from smooth to sharp fillet. It provides some suggestions to prevent the crankshaft rupture in terms of fatigue strength and thread structure. © 2020
Number of references: 16
Main heading: Corrosion
Controlled terms: Crack initiation - Hydrogen embrittlement - Pumps - Fatigue crack propagation - Fracture - Failure analysis - Corrosion fatigue - Finite element method - Surface treatment - Crankshafts
Uncontrolled terms: Discharge capacities - Failure mechanism - Fatigue crack initiation - Fillet radius - Finite element modelling - Fractographic observations - Hardening treatment - Theoretical calculations
Classification code: 531.1 Metallurgy - 539.1 Metals Corrosion - 601.2 Machine Components - 618.2 Pumps - 921.6 Numerical Methods - 951 Materials Science
DOI: 10.1016/j.engfailanal.2020.104378
Funding Details: Number: 2019B-4013, Acronym: -, Sponsor: -;
Funding text: The authors gratefully acknowledge the financial support of CNPC science and technology development project (No. 2019B-4013).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

17. Ordered mesoporous carbon with atomically dispersed Fe-Nx as oxygen reduction reaction electrocatalyst in air-cathode microbial fuel cells

Accession number: 20202408812481

Authors: Luo, Xiao (1); Han, Wuli (1); Du, Weichao (2, 3); Huang, Zhiming (4); Jiang, Yu (1); Zhang, Yan (1)
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Corresponding author: Luo, Xiao(cdlx19850711@163.com)
Source title: Journal of Power Sources
Abbreviated source title: J Power Sources
Volume: 469
Issue date: 1 September 2020
Publication year: 2020
Article number: 228184
Language: English
ISSN: 03787753
CODEN: JPSODZ
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: As a renewable energy source, microbial fuel cell (MFC) exhibits a great potential in solution of energy crisis and environmental pollution. The cathode catalyst for oxygen reduction reaction (ORR) is one of the most important factors that can affect the performance of fuel cell. Herein, MOF-derived ordered mesoporous carbon (Fe–N/C) with atomically dispersed Fe-Nx active sites was successfully prepared. It can significantly improve the ORR activity in alkaline, acidic or neutral electrolyte, inspiring us to establish a MFC using it as cathode catalyst. The Fe–N/C-MFC performs great maximum power density (1232.9 mW m-2), high Open Circuit Voltage (0.644 V) and large constant output voltage (0.46 V) which are all superior to that of 20% Pt–C. The ohmic resistance (Rohm) and charge transfer resistance (Rct) of Fe–N/C decrease by 36.2% and 88.7% from 25.4 Ω to 110.6 Ω (N/C) to 16.2 Ω and 12.5 Ω (Fe–N/C), respectively. Note that the Fe–N/C holds an ordered mesoporous structure with the characteristic of Fe-Nx active sites doping, and content of pyridine-like N and graphite-like N are both significantly increased compared with N/C sample. These results make the atomically dispersed Fe-Nx ordered mesoporous Fe–N/C promising for commercial application of MFC. © 2020 Elsevier B.V.
Number of references: 57
Main heading: Charge transfer
Controlled terms: Electrocatalysts - Mesoporous materials - Microbial fuel cells - Organic carbon - Energy policy - Renewable energy resources - Electrolytic reduction - Open circuit voltage - Electrolytes - Cathodes - Catalyst activity - Iron compounds - Carbon - Oxygen
Uncontrolled terms: Charge transfer resistance - Commercial applications - Constant output voltage - Environmental pollutions - Maximum power density - Ordered mesoporous carbon - Ordered mesoporous structures - Renewable energy source
Classification code: 461.8 Biotechnology - 525.1 Energy Resources and Renewable Energy Issues - 525.6 Energy Policy - 533.1 Ore Treatment - 702 Electric Batteries and Fuel Cells - 702.2 Fuel Cells - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Electrical_Resistance 1.62e+01Ohms, Percentage 3.62e+01%, Percentage 8.87e+01%, Voltage 4.60e-01V, Voltage 6.44e-01V
DOI: 10.1016/j.jpowsour.2020.228184
Funding Details: Number: PLC20190703, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 51472034, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This Study was funded by The Open Fund of State Key Laboratory of Oiland Gas Reservoir Geology and Exploitation (Chengdu University of Technology) (Grant No. PLC20190703), National Natural Science Foundation of China (Grant No. 51472034).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

18. An Optical Fiber Sensor for Oriented Bending Based on Eccentric UV Exposure (*Open Access*)

Accession number: 20205309699111
Title of translation:
Authors: Yu, Dakuan (1); Qiao, Xueguang (2); Wang, Xiangyu (1); Zhang, Lisong (3)

Author affiliation: (1) Shaanxi Key Laboratory of Optical Information Technology, School of Physical Science and Technology, Northwestern Polytechnical University, Xi'an; 710072, China; (2) School of Physics, Northwest University, Xi'an; 710069, China; (3) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, School of Science, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Xibei Gongye Daxue Xuebao/Journal of Northwestern Polytechnical University
Abbreviated source title: Xibei Gongye Daxue Xuebao
Volume: 38
Issue: 6
Issue date: December 2020
Publication year: 2020
Pages: 1235-1239
Language: Chinese
ISSN: 10002758
CODEN: XGDUE2
Document type: Journal article (JA)
Publisher: Northwestern Polytechnical University
Abstract: The optical fiber sensor for oriented bending based on eccentric UV exposure is fabricated. With the eccentric UV exposure on the ready-made Michelson interference fiber structure, the optical sensor gives the oriented bending characteristics by changing the radial circular symmetry of fiber cladding refractive indexes. The principle of the asymmetric process of the eccentric exposure to cladding mode are analyzed. The bending loss of the excited cladding mode in different radial directions is detected. The experimental results show that the Michelson interference has some oriented bending characteristics in the eccentric UV exposure process. There are different bending sensitivity in different radial directions. Furthermore, the bending sensitivity is higher on the exposed side and the curvature sensitivity is 5.5 dB•m. On the opposite side, the bending sensitivity is lower and the curvature sensitivity is -1.31 dB•m. With these oriented bending characteristics, the optical sensor can be applied to oil and gas exploration and development and to oriented seismic wave vector detection. © 2020 Journal of Northwestern Polytechnical University.
Number of references: 16
Main heading: Refractive index
Controlled terms: Optical fiber fabrication - Petroleum prospecting - Cladding (coating) - Fiber optic sensors - Fibers
Uncontrolled terms: Bending characteristics - Circular symmetry - Curvature sensitivities - Fiber structures - Michelson interferences - Oil and gas exploration - Radial direction - UV exposure process
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 741.1 Light/Optics - 741.1.2 Fiber Optics
DOI: 10.1051/jnwpu/20203861235
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

19. Synthesis of two chiral surfactants by a simple method and the surface activity evaluation

Accession number: 20203209011179
Authors: Chen, Gang (1, 2); Yan, Jiao (1); Bai, Yun (1); Dong, Sanbao (1, 2); Liu, Dengwei (3); Zhang, Jie (1); Zhu, Shidong (1, 2); Qu, Chengtun (1, 2)
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Corresponding author: Chen, Gang(gangchen@xsyu.edu.cn)
Source title: Journal of Molecular Liquids
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Volume: 316
Issue date: 10 October 2020
Publication year: 2020
Article number: 113892
Language: English

ISSN: 01677322
CODEN: JMLIDT
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: In order to expand the application range of surfactants, two chiral surfactants named CTACYT and CTATYS were synthesized by reacting cetyltrimethylammonium chloride (CTAC) with L-cysteine and L-tyrosine, respectively by a simple method. Studies show that the foaming ability, foam stability and emulsifying properties of both CTACYT and CTATYS are superior to CTAC. The corrosion inhibition efficiencies of CTACYT and CTATYS are 96.72% and 90.22%, respectively, which are higher than that of CTAC. The new chiral surfactants remain the chiral character, and the specific optical rotations of CTACYT and CTATYS were 8.1° and 11.6°, respectively. This work provides a new and easy way to the synthesis of chiral surfactants, which will benefit the related research in this field. © 2020
Number of references: 28
Main heading: Emulsification
Controlled terms: Amino acids - Corrosion inhibitors - Surface active agents - Chlorine compounds - Corrosion
Uncontrolled terms: Application range - Cetyltrimethylammonium chloride - Corrosion inhibition efficiency - Emulsifying property - Foam stability - Foaming ability - Specific optical rotations - Surface activities
Classification code: 539.2.1 Protection Methods - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds
Numerical data indexing: Percentage 9.02e+01%, Percentage 9.67e+01%
DOI: 10.1016/j.molliq.2020.113892
Funding Details: Number: 2019KW-061, Acronym: -, Sponsor: -; Number: 21376189, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was financially supported by the grants from National Natural Science Foundation of China (21376189 , 51974245) and Shaanxi Key Research and Development Program (2019KW-061). 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

20. Efficient no-glycerol biodiesel production using a novel biotemplated hierarchical porous-structure CaO(O)

Accession number: 20200508112235
Authors: Tang, Ying (1, 2); Yang, Ying (1); Liu, Huan (1); Li, Zhaoyi (1); Zhang, Jie (1); 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 Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, China National Petroleum Corporation, Beijing, China; (3) School of Chemistry and Chemical Engineering, Yulin University, Yulin, China
Corresponding author: Tang, Ying(tangying78@xsyu.edu.cn)
Source title: Journal of Chemical Technology and Biotechnology
Abbreviated source title: J. Chem. Technol. Biotechnol.
Volume: 95
Issue: 5
Issue date: May 1, 2020
Publication year: 2020
Pages: 1467-1475
Language: English
ISSN: 02682575
E-ISSN: 10974660
CODEN: JCTBDC
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: BACKGROUND: In order to obtain an effective solid base with high surface area and hierarchical distribution of pore size, CaO(O) was synthesized via an exotemplating method, using radish as template and calcium acetate as precursor. RESULTS: The CaO(O) obtained by calcination of the impregnated biomorphic template demonstrated effective catalytic activity for the coupling transesterification of vegetable oil to produce biodiesel under mild reaction conditions using tri-components (methanol, oil and methyl acetate) as resources. High yield of biodiesel, 98.6%, was obtained with a molar rapeseed oil/methyl acetate/methanol ratio of 1:1:8 under 65 °C at 2 h, which is greatly shorter than 6 h over commercial calcium oxide (CaO). CONCLUSION: Various techniques including nitrogen physical

adsorption, X-ray diffraction (XRD), Fourier-transform infrared (FTIR), thermogravimetric (TG), carbon dioxide-chemical adsorption and morphology have been employed to characterize the samples. These results demonstrated that the synthesized CaO derived from plant template has a large surface area and various pore diameter distribution which cause hierarchical basic sites over the solid base. © 2020 Society of Chemical Industry. © 2020 Society of Chemical Industry
Number of references: 40
Main heading: Biodiesel
Controlled terms: Catalyst activity - Molar ratio - Vegetable oils - Chemical industry - Lime - Transesterification - Morphology - Gas adsorption - Pore size - Fourier transform infrared spectroscopy - Carbon dioxide
Uncontrolled terms: Biodiesel production - Chemical adsorption - Fourier transform infrared - Hierarchical distribution - Hierarchical porous structures - Mild reaction conditions - Physical adsorption - Pore diameter distribution
Classification code: 523 Liquid Fuels - 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 - 804.2 Inorganic Compounds - 805 Chemical Engineering, General - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 9.86e+01%, Temperature 3.38e+02K, Time 2.16e+04s, Time 7.20e+03s
DOI: 10.1002/jctb.6337
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 21763030, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 201805038YD16CG22, Acronym: -, Sponsor: -; Number: 2019GY-136, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department;
Funding text: The work was supported financially by the National Science Foundation of China (No. 21763030), Scientific Research Plan Projects of Shaanxi Science and Technology Department (2019GY-136) and Xi'an Science and Technology Project (201805038YD16CG22 (3)). The authors would like to thank the work of Modern Analysis and Testing Center of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

21. One-step synthesis of methylal via methanol oxidation by Mo:Fe(x)/HZSM-5 bifunctional catalyst

Accession number: 20194307565830
Authors: Yuan, Meng (1); Che, Yuanjun (1); Tang, Ruiyuan (2); Li, Shen (3); Zhang, Yanpeng (3); Tian, Yuanyu (1, 3); Qiao, Yingyun (1); Liu, Qing (3); Li, Dawei (1)
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Volume: 261
Issue date: 1 February 2020
Publication year: 2020
Article number: 116416
Language: English
ISSN: 00162361
CODEN: FUELAC
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The traditional one-step process for preparing methylal bifunctional catalyst has multiple limitations, including high cost, high acidity and low yield. In order to overcome these limitations, the author designed and studied a series of Mo:Fe(x)/HZSM-5 function catalyst with different ferromolybdenum ratios. The one-step process for preparing methyl acetal is realized in a fluidized bed reactor. The effect of different ferromolybdenum ratios on its catalytic performance was investigated and the optimum ferromolybdenum ratio catalyst was found. The results show that this new process and catalyst can overcome the disadvantages of traditional bifunctional catalysts and achieve a relatively high DMM yield. For instance, the methanol conversion ratio and DMM selectivity of the Mo:Fe(2)/HZSM-5 bifunctional catalyst reached 87.44% and 93%, respectively. Moreover, the recorded DMM yield was 81.32%, which

was much higher than that of other research results. At the same time, the XPS catalyst activity and activation energy results show that increased molybdenum loading catalytic effect. However, when Mo/Fe > 2, the mutual promotion effect would be larger and part of the formaldehyde obtained by oxidative dehydrogenation of methanol would be further oxidized to obtain the by-product formic acid, further producing more methyl formate. In addition, the self-made Mo:Fe(2)/HZSM-5 dual-functional catalyst exhibits high stability and carbon deposition resistance under severe operating conditions, compared to other bifunctional catalysts of this process. © 2019
Number of references: 42
Main heading: Methanol
Controlled terms: Catalyst activity - Chemical reactors - Catalyst selectivity - Fluidized beds - Activation energy - Dehydrogenation
Uncontrolled terms: Bi-functional catalysts - Catalytic performance - Dimethoxymethane - Fluidized bed reactors - Methanol conversion ratios - Methanol Oxidation - Operating condition - Oxidative dehydrogenations
Classification code: 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Percentage 8.13e+01%, Percentage 8.74e+01%, Percentage 9.30e+01%
DOI: 10.1016/j.fuel.2019.116416
Funding Details: Number: 2018CXGC0301, Acronym: -, Sponsor: -; Number: 21576293,21576294,21878335, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: ZR2017QEE006, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Heavy Oil Processing; Number: 18CX02121A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: -, Acronym: -, Sponsor: Tai'shan Scholar Engineering Construction Fund of Shandong Province of China;
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 Fundamental Research Funds for the Central Universities (18CX02121A), the Supported by State Key Laboratory of Heavy Oil Processing and the Shandong Natural Science Foundation (ZR2017QEE006).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 Fundamental Research Funds for the Central Universities (18CX02121A), the Supported by State Key Laboratory of Heavy Oil Processing and the Shandong Natural Science Foundation (ZR2017QEE006).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

22. Robust regularized extreme learning machine for regression with non-convex loss function via DC program

Accession number: 20202508849516
Authors: Wang, Kuaini (1, 2); Pei, Huimin (3); Cao, Jinde (2); Zhong, Ping (4)
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Corresponding author: Cao, Jinde(jdcao@seu.edu.cn)
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Issue date: July 2020
Publication year: 2020
Pages: 7069-7091
Language: English
ISSN: 00160032
CODEN: JFINAB
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Extreme learning machine (ELM) is considered as a powerful data-driven modeling method and has been widely used to various practical fields. It relies on the assumption that samples are completely clean without noise or worst yet. However, this is often not the case in the real-world applications, and results in poor robustness. In

this paper, we focus on addressing a key issue of inefficiency in ELM when confronting with outliers. Introducing the non-convex loss function, we propose a robust regularized extreme learning machine for regression by difference of convex functions (DC) program, denoted as RRELM. The proposed non-convex loss function sets a constant penalty on any large outliers to suppress their negative effects, and can be decomposed into the difference of two convex functions. The RRELM can be successfully solved by DC optimization. Numerical experiments were conducted on various datasets to examine the validity of RRELM. Each experiment was randomly contaminated with 0%, 10%, 20%, 30% and 40% outliers levels in the training samples. We also applied RRELM to the financial time series datasets prediction. The experimental results verify that the proposed RRELM can yield superior generalization performance. Moreover, it is less affected with the increasing proportions of outliers than the competing method. © 2020 The Franklin Institute
Number of references: 40
Main heading: Machine learning
Controlled terms: Functions - Knowledge acquisition - Statistics - Financial data processing
Uncontrolled terms: Convex functions - Data driven modeling methods - Difference of convex functions - Extreme learning machine - Financial time series - Generalization performance - Non-convex loss function - Numerical experiments
Classification code: 723.4 Artificial Intelligence - 921 Mathematics - 922.2 Mathematical Statistics
Numerical data indexing: Percentage 0.00e+00%, Percentage 1.00e+01%, Percentage 2.00e+01%, Percentage 3.00e+01%, Percentage 4.00e+01%
DOI: 10.1016/j.jfranklin.2020.05.027
Funding Details: Number: 2018M642129, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: BM2017002, Acronym: -, Sponsor: -; Number: 61833005, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The work was supported by the National Natural Science Foundation of China under Grant No. 61833005 and 61907033 , the Jiangsu Provincial Key Laboratory of Networked Collective Intelligence under Grant No. BM2017002 and the China Postdoctoral Science Foundation under Grant No. 2018M642129 .
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

23. Deblending of seismic data based on S-transform adaptive filtering iteration

Accession number: 20210109725809
Title of translation: S
Authors: Huang, Dezhi (1); Han, Liguo (1); Li, Huifeng (2); Yang, Feilong (2); Zhao, Xiaoyu (3); Sun, Nan (4)
Author affiliation: (1) College of Geo-exploration Science and Technology, Jilin University, Changchun; 130026, China; (2) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) North China Branch, Sinopec Geophysical Corporation, Zhengzhou; 450000, China; (4) Research Institute of Exploration and Development, Northeast Oil & Gas Branch of Sinopec, Changchun; 130062, China
Corresponding author: Huang, Dezhi(410821265@qq.com)
Source title: Shiyou Diqiu Wuli Kantan/Oil Geophysical Prospecting
Abbreviated source title: Shiyou Diqiu Wuli Kantan
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Issue: 6
Issue date: December 15, 2020
Publication year: 2020
Pages: 1253-1262
Language: Chinese
ISSN: 10007210
CODEN: SDWKEP
Document type: Journal article (JA)
Publisher: Science Press
Abstract: S-transform is a time-frequency analysis method developed from wavelet transform and short-time Fourier transform.After NMO correction,the amplitude and phase of the signal in every seismic trace of a CMP gather are consistent at the same time,and the blended noises in blended seismic data are distributed randomly.Therefore,the distribution of noises and signals in the S-transform spectra of each trace can be effectively determined by stacking CMP traces after NMO correction,and using the S-transform spectra of the stacked trace as references,the designed filter of S-transform spectra can separate the blended noises.In this study,we first designed a filter based on the deviation between the S-transform spectra of seismic data in CMP gathers and the S-transform spectra of stacked traces after NMO correction,and then extracted signals and deblended noises after multi-level adaptive filtering and

multiple iterations.Applications to theoretical data and simulated actual seismic data have proved the method can effectively extract signals and separate deblended noises and random noises.
Number of references: 20
Main heading: Blending
Controlled terms: Seismic response - Seismic waves - Adaptive filtering - Adaptive filters - Wavelet transforms - Geophysical prospecting
Uncontrolled terms: Filter-based - Fourier - Multilevels - Random noise - S transforms - Seismic datas - Seismic traces - Time-frequency analysis methods
Classification code: 481.4 Geophysical Prospecting - 484 Seismology - 484.2 Secondary Earthquake Effects - 802.3 Chemical Operations - 921.3 Mathematical Transformations
DOI: 10.13810/j.cnki.issn.1000-7210.2020.06.011
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

24. A Nonparametric Method for Detecting Differential DNA Methylation Regions

Accession number: 20210609885355
Authors: Sun, Xifang (1); Zhu, Jiaqiang (2); Sun, Shiquan (3)
Author affiliation: (1) Xi'an Shiyou University, School of Science, Department of Mathematics, Xi'an, Shaanxi; 710065, China; (2) University of Michigan, School of Public Health, Department of Biostatistics, Ann Arbor; 48019, United States; (3) Xi'an Jiaotong University, Xi'an, Key Laboratory of Trace Elements and Endemic Diseases of National Health Commission, School of Public Health, Shaanxi; 710061, China
Source title: Proceedings - 2020 IEEE International Conference on Bioinformatics and Biomedicine, BIBM 2020
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Part number: 1 of 1
Issue title: Proceedings - 2020 IEEE International Conference on Bioinformatics and Biomedicine, BIBM 2020
Issue date: December 16, 2020
Publication year: 2020
Pages: 1668-1671
Article number: 9312983
Language: English
ISBN-13: 9781728162157
Document type: Conference article (CA)
Conference name: 2020 IEEE International Conference on Bioinformatics and Biomedicine, BIBM 2020
Conference date: December 16, 2020 - December 19, 2020
Conference location: Virtual, Seoul, Korea, Republic of
Conference code: 166496
Sponsor: Bio-Synergy Research Center (BSRC); Korea Genome Open HRD (K-GENOME); Korea Genome Organization (KOGO); Korean Federation of Science and Technology Societies (KOFST); Seoul National University; Seoul National University (SNU) Bioinformatics Institute
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: DNA methylation has long been known as an epigenetic gene silencing mechanism. For a motivating example, the methylomes of cancer and non-cancer cells show a number of methylation differences, indicating that some of cancer cells ' aggressive properties could be a result of certain methylation features. Robust methods for detecting differentially methylated regions (DMRs) could help scientists narrow down biologically important regions in the genome. Despite the number of statistical methods developed for detecting DMR, there is no default or strongest method. Fisher's exact test is direct, but is inadequate for data with multiple replications, while regressionbased methods often come with a large number of assumptions. More complicated methods have been proposed, but those are often difficult to interpret. In this paper, we propose a three-step nonparametric kernel smoothing method that is both flexible and straightforward to implement and interpret. The proposed method relies on local quadratic fitting method to find the set of equilibrium points (points at which the first derivative is 0) and the corresponding set of confidence windows. The potential regions are further refined using biological criteria, and selected based on a Bonferroni adjusted t-test cutoff. Using a comparison of three senescent and three proliferating cell lines to illustrate our method, we were able to identify a total of 1,077 DMRs on chromosome 21. © 2020 IEEE.
Number of references: 13
Main heading: Methylation
Controlled terms: Alkylation - Cell culture - Chromosomes - DNA - Cancer cells - Cell proliferation - Diseases

Uncontrolled terms: DNA Methylation - Epigenetic gene silencing - Equilibrium point - First derivative - Kernel-smoothing method - Nonparametric methods - Potential region - Proliferating cells
Classification code: 461.2 Biological Materials and Tissue Engineering - 461.6 Medicine and Pharmacology - 461.9 Biology - 802.2 Chemical Reactions - 802.3 Chemical Operations
DOI: 10.1109/BIBM49941.2020.9312983
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

25. Zeolite-Enhanced Sustainable Pd-Catalyzed C-C Cross-Coupling Reaction: Controlled Release and Capture of Palladium

Accession number: 20201008255438
Authors: Wang, Yanyan (1); Liao, Jiaping (1); Xie, Zunyuan (1); Zhang, Kan (1); Wu, Ya (1, 3); Zuo, Ping (1); Zhang, Weiqiang (1); Li, Jiyang (2); Gao, Ziwei (1)
Author affiliation: (1) Key Laboratory of Applied Surface and Colloid Chemistry MOE, School of Chemistry and Chemical Engineering, Shaanxi Normal University, Xi'an; 710119, China; (2) State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, College of Chemistry, Jilin University, Changchun; 130012, China; (3) College of Chemistry and Chemical Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Zhang, Weiqiang(zwq@snnu.edu.cn)
Source title: ACS Applied Materials and Interfaces
Abbreviated source title: ACS Appl. Mater. Interfaces
Volume: 12
Issue: 10
Issue date: March 11, 2020
Publication year: 2020
Pages: 11419-11427
Language: English
ISSN: 19448244
E-ISSN: 19448252
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Supported palladium catalysts have attracted significant attention for use in cross-coupling reactions due to their recyclability. However, the inevitable progressive loss of Pd that occurs in the catalytic process deactivates the catalysts, which hinders their sustainable application. Herein, we report a zeolite-enhanced sustainable Pd catalyst for C-C cross-coupling reactions. Zeolite does a good job of acting as a sink for Pd2+ ions. This catalyst exhibits an excellent homogeneous catalytic performance by releasing Pd species from zeolite. In addition, the Pd2+ ions were successfully recaptured in a controlled catalytic system by combining the uniform microporous structure and good adsorption features of zeolite. The release/capture mechanism of the Pd species guaranteed the high loading and high dispersion of Pd on the recycled catalyst. The 0.84%Pd@USY catalysts were reused at least 10 times in water without an appreciable reduction in activity. This study presents a new perspective toward the design of a highly efficient and sustainable supported metal catalyst. Copyright © 2020 American Chemical Society.
Number of references: 60
Main heading: Zeolites
Controlled terms: Catalysis - Catalyst supports - Palladium - Palladium compounds
Uncontrolled terms: C-C cross-couplings - Catalytic performance - Cross coupling reactions - Micro-porous structure - release/capture - Supported palladium catalysts - Supported-metal catalysts - sustainable
Classification code: 547.1 Precious Metals - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds
DOI: 10.1021/acsami.9b18110
Funding Details: Number: 21571121,21701108,21771122, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017M623110, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2018JQ2012, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2016YFB0701100, Acronym: -, Sponsor: National Basic Research Program of China (973 Program);
Funding text: We acknowledge financial support from the National Natural Science Foundation of China (Project Nos. 21771122, 21571121, and 21701108), the National Key Research and Development Program of China (Grant No. 2016YFB0701100), China Postdoctoral Science Foundation (No. 2017M623110), and the Natural Science Foundation of Shaanxi Province (Program No. 2018JQ2012).
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village

26. Subgroup perfect codes in Cayley graphs (*Open Access*)

Accession number: 20204409419343
Authors: Ma, Xuanlong (1); Walls, Gary L. (2); Wang, Kaishun (3); Zhou, Sanming (4)
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Source title: SIAM Journal on Discrete Mathematics
Abbreviated source title: SIAM J Discrete Math
Volume: 34
Issue: 3
Issue date: September 1, 2020
Publication year: 2020
Pages: 1909-1921
Language: English
ISSN: 08954801
CODEN: SJDMEC
Document type: Journal article (JA)
Publisher: Society for Industrial and Applied Mathematics Publications
Abstract: Let Γ be a graph with vertex set $V(\Gamma)$. A subset C of $V(\Gamma)$ is called a perfect code in Γ if C is an independent set of Γ and every vertex in $V(\Gamma) \setminus C$ is adjacent to exactly one vertex in C. A subset C of a group G is called a perfect code of G if there exists a Cayley graph of G which admits C as a perfect code. A group G is said to be code-perfect if every proper subgroup of G is a perfect code of G. In this paper we prove that a group is code-perfect if and only if it has no elements of order 4. We also prove that a proper subgroup H of an abelian group G is a perfect code of G if and only if the Sylow 2-subgroup of H is a perfect code of the Sylow 2-subgroup of G. This reduces the problem of determining when a given subgroup of an abelian group is a perfect code to the case of abelian 2-groups. Finally, we determine all subgroup perfect codes in any generalized quaternion group. © 2020 Society for Industrial and Applied Mathematics
Number of references: 32
Main heading: C (programming language)
Controlled terms: Group theory - Codes (symbols) - Graph Databases
Uncontrolled terms: Abelian group - Cayley graphs - Independent set - Perfect codes - Quaternion group - Vertex set
Classification code: 723.1.1 Computer Programming Languages - 723.2 Data Processing and Image Processing - 723.3 Database Systems - 921.1 Algebra - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.1137/19M1258013
Funding Details: Number: -, Acronym: UNIMELB, Sponsor: University of Melbourne; Number: 11801441, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 11671043,2020JQ-761,61771019, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: \ast Received by the editors April 24, 2019; accepted for publication (in revised form) July 13, 2020; published electronically September 1, 2020. https://doi.org/10.1137/19M1258013 Funding: The first author was supported by the National Natural Science Foundation of China (grant 11801441) and by the Natural Science Basic Research Program of Shaanxi (program 2020JQ-761). The third author was supported by the National Natural Science Foundation of China (grant 11671043). The fourth author was supported by the National Natural Science Foundation of China (grant 61771019) and by the Research Grant Support Scheme of The University of Melbourne. \dagger School of Science, Xi'an Shiyou University, Xi'an 710065, China (xuanlma@mail.bnu.edu.cn). \ddagger Department of Mathematics, Southeastern Louisiana University, Hammond, LA 70402 (gary.walls@selu.edu). \S Laboratory of Mathematics and Complex Systems (Ministry of Education), School of Mathematical Sciences, Beijing Normal University, Beijing 100875, China (wangks@bnu.edu.cn). \P School of Mathematics and Statistics, The University of Melbourne, Parkville, VIC 3010, Australia (sanming@unimelb.edu.au).
Compendex references: YES
Open Access type(s): All Open Access, Green
Database: Compendex
Data Provider: Engineering Village

27. Toward High-Performance Electron/Hole-Transporting-Layer-Free, Self-Powered CsPbIBr2 Photodetectors via Interfacial Engineering

Accession number: 20200608131558
Authors: Zhang, Zeyulin (1, 2); Zhang, Wentao (1); Jiang, Qubo (1); Wei, Ziming (1); Deng, Mingyu (2); Chen, Dandan (3); Zhu, Weidong (2); Zhang, Jincheng (2); You, Hailong (2)
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Volume: 12
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Pages: 6607-6614
Language: English
ISSN: 19448244
E-ISSN: 19448252
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Self-powered photodetectors (PDs) with inorganic lead halide perovskites hold multiple traits of high sensitivity, fast response, independence from external power supply, and excellent sustainability and stability, thus holding a great promise for practical applications. However, they generally contain high-temperature-processed electron-transporting layers (ETLs) and high-cost, unstable hole-transporting layers (HTLs) coupled with noble metal electrodes, which bring significant obstacles of production cost and stability for their potential commercialization. Herein, we demonstrate the building of high-performance HTL/ETL-free, self-powered CsPbIBr2 PD with simplified architecture of fluorine-doped tin oxide (FTO)/CsPbIBr2/carbon upon interfacial modification by polyethyleneimine (PEI). The optimized PD yields a dark current of 2.03 × 10-9 A, peak responsivity (R) of 0.32 A/W, maximum specific detectivity (D*) of 3.74 × 1012 Jones, and response time of 1.21 μs. These figures of merit are far beyond those of the one prepared without PEI modification and even the PD containing TiO2 ETL. Hence, our work suggests a highly feasible route to develop self-powered PDs with significantly simplified fabrication and a reduced production cost.

Number of references: 60
Main heading: Photodetectors
Controlled terms: Titanium dioxide - Bromine compounds - Photons - Tin oxides - Nanocomposites - Perovskite - Precious metals - Lead compounds - Costs
Uncontrolled terms: CsPbIBr2 - Electron transporting layer - External power supplies - Fluorine doped tin oxide - Hole transporting layers - Interfacial modification - Self-powered - simplified configuration
Classification code: 482.2 Minerals - 547.1 Precious Metals - 761 Nanotechnology - 804.2 Inorganic Compounds - 911 Cost and Value Engineering; Industrial Economics - 931.3 Atomic and Molecular Physics - 933 Solid State Physics
Numerical data indexing: Time 1.21e-06s
DOI: 10.1021/acsami.9b19075
Funding Details: Number: 61565004,61804113,61874083,61965005,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2017ZX02101007-003, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: -, Acronym: -, Sponsor: Science and Technology Major Project of Guangxi;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

28. Sectional void fraction measurement of gas-water two-phase flow by using a capacitive array sensor

Accession number: 20203008961581
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Source title: Flow Measurement and Instrumentation
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Article number: 101788
Language: English
ISSN: 09555986
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The sectional void fraction measurement for multiphase flow is usually influenced by flow patterns. Inspired by electrical capacitance tomography (ECT) devices applied to flow imaging (whose measured capacitance data contain both the flow pattern and sectional void fraction information), a capacitive array sensor is developed to realize two functions, flow pattern recognition and void fraction measurement, simultaneously; so that the void fraction measurement can be conducted for a certain flow pattern and the measurement accuracy can be expected to be improved. The main idea of the proposed method can be described as: firstly, the proper feature vectors are extracted from the electrical signal to identify the flow pattern (the BPNN model with GDX learning algorithm is used for flow pattern identification); and then the average of electrical signal is applied to estimates the void fraction by the corresponding calibration curve. An experimental platform of air/water two-phase flow is built (on which 3 flow patterns can be generated stably) to test the performance of the proposed method. The results support the correctness and effectiveness of the proposed method. © 2020
Number of references: 32
Main heading: Two phase flow
Controlled terms: Capacitance - Pattern recognition - Capacitive sensors - Flow patterns - Void fraction - Electric impedance tomography
Uncontrolled terms: Calibration curves - Capacitive arrays - Electrical Capacitance Tomography - Electrical signal - Experimental platform - Flow pattern identification - Measurement accuracy - Void fraction measurement
Classification code: 631.1 Fluid Flow, General - 701.1 Electricity: Basic Concepts and Phenomena - 732 Control Devices - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.flowmeasinst.2020.101788
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

29. Supramolecular assembly of protein-based nanoparticles based on tumor necrosis factor-related apoptosis-inducing ligand (TRAIL) for cancer therapy

Accession number: 20200408081388
Authors: Li, Hong (1); Zhao, Jie (2); Wang, Anhe (3); Li, Qi (3); Cui, Wei (2)
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Corresponding author: Cui, Wei(cuiwei@iccas.ac.cn)
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Abbreviated source title: Colloids Surf. A Physicochem. Eng. Asp.
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Article number: 124486
Language: English
ISSN: 09277757
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Molecular self-assembly of functional proteins has garnered intense interest for the development of nanomaterials. Tumor necrosis factor-related apoptosis-inducing ligand (TRAIL), as one of the most promising agents for cancer therapy, could selectively induce the apoptotic cell death in tumor cells while not on normal cells. In this study, protein-based nanoparticles were constructed with TRAIL and a dipeptide, diphenylalanine (FF), through molecular self-assembly. TRAIL-FF nanoparticles with sizes ranging from 60 nm to 500 nm could be prepared by controlling the concentration and the ratio of the two components. These nanoparticles could locate around the cytomembrane of MCF-7 cells due to the specific interaction between TRAIL and death receptors, thus transduce apoptotic signal. Therefore, the TRAIL-FF nanoparticles showed distinct killing effect on the cancer cells, such as MCF-7 and H460 cells, and the IC50 of the nanoparticles on H460 cells was about 260 ng/mL. The approach presented herein may be applicable to the fabrication of an extended range of protein-based functional biomaterials. © 2020 Elsevier B.V.
Number of references: 36
Main heading: Nanoparticles
Controlled terms: Cancer cells - Cell death - Glycoproteins - Proteins - Self assembly - Diseases - Ligands - Macrophages - Tumors
Uncontrolled terms: Apoptotic cell death - Cancer therapy - Diphenylalanine - Molecular self assembly - Specific interaction - Supramolecular assemblies - TRAIL - Tumor necrosis factor-related apoptosis-inducing ligands
Classification code: 461.2 Biological Materials and Tissue Engineering - 461.6 Medicine and Pharmacology - 461.9 Biology - 461.9.1 Immunology - 761 Nanotechnology - 801.4 Physical Chemistry - 804.1 Organic Compounds - 933 Solid State Physics - 951 Materials Science
Numerical data indexing: Mass_Density 2.60e-04kg/m3, Size 6.00e-08m to 5.00e-07m
DOI: 10.1016/j.colsurfa.2020.124486
Funding Details: Number: 2018JQ2047, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 20190605, Acronym: -, Sponsor: -; Number: 21433010, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

30. Driver Response to Variable Message Signs on Urban Arterial Roads in Xi'an

Accession number: 20212310461553
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Source title: CICTP 2020: Advanced Transportation Technologies and Development-Enhancing Connections - Proceedings of the 20th COTA International Conference of Transportation Professionals
Abbreviated source title: CICTP: Adv. Transp. Technol. Dev.-Enhancing Connect. - Proc. COTA Int. Conf. Transp. Prof.
Part number: 1 of 1

Issue title: CICTP 2020: Advanced Transportation Technologies and Development-Enhancing Connections - Proceedings of the 20th COTA International Conference of Transportation Professionals
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ISBN-13: 9780784482933
Document type: Conference article (CA)
Conference name: 20th COTA International Conference of Transportation Professionals: Advanced Transportation Technologies and Development-Enhancing Connections, CICTP 2020
Conference date: August 14, 2020 - August 16, 2020
Conference location: Xi'an, China
Conference code: 168677
Sponsor: Transportation and Development Institute (T and DI) of the American Society of Civil Engineers (ASCE)
Publisher: American Society of Civil Engineers (ASCE)
Abstract: Variable message signs (VMSs) are one of the intelligent transportation systems (ITSs) technologies and widely used to disseminate traffic information under various circumstances to assist drivers en-route in making route choice decisions. Here, we investigate drivers' responses to VMS. The driver's response to VMS is divided into three groups: staying on the original route, hesitation to select the alternative route, and changing to the alternative route. Using the collected data, three models which are an ordered logit model (OLM), an ordered probit model (OPM), and a multinomial logit model (MNL), were respectively developed to predict drivers' route choice decision making with VMS messages. We found that drivers who are well-educated, travel during non-peak hours, and travel frequently will likely change their routes corresponding to VMS information. From the perspective of the overall prediction accuracy, the proposed MNL is superior to OLM and OPM. © ASCE.
Number of references: 26
Main heading: Variable message signs
Controlled terms: Transportation routes - Intelligent systems - Advanced traveler information systems - Decision making
Uncontrolled terms: Alternative routes - Intelligent transportation systems - Multinomial logit model - Ordered logit model - Ordered probit model - Prediction accuracy - Traffic information - Urban arterial road
Classification code: 406.1 Highway Systems - 432.4 Highway Traffic Control - 723.4 Artificial Intelligence - 912.2 Management
DOI: 10.1061/9780784482933.324
Funding Details: Number: 2018YFC0807500, Acronym: -, Sponsor: -; Number: 51878066, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 18YJCZH130, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: 300102228202,300102229666, Acronym: CHD, Sponsor: Chang'an University; Number: -, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

31. Enhanced Anti-CO poisoning of platinum on mesoporous carbon spheres by abundant hydroxyl groups in methanol electro-oxidation

Accession number: 20200408080938
Authors: Chen, Guanjun (1); Dai, Zhengfei (1, 2); Bao, Hongwei (1); Zhang, Long (3); Sun, Lan (1); Shan, Huaqiang (1); Liu, Shuai (4); Ma, Fei (1)
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Language: English
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CODEN: ELCAAV
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: To date, substantial efforts have been made to improve the electrocatalytic performance and durability of Pt-based catalysts for the methanol oxidation reaction (MOR). However, these catalysts are still limited by their high susceptibility to poisoning due to strong COads adsorption on Pt surfaces. Herein, a new MOR catalyst is reported as a possible solution to this challenge. This catalyst features cobalt carbonate hydroxide (CoCH) nanorods that are intimately enclosed by Pt/Vulcan XC-72 carbon (Pt/C), wherein Pt nanoparticles with a diameter of $_{\sim 2}$ nm are uniformly decorated on Vulcan XC-72 carbon. Compared to Pt/C, CoCH–Pt/C exhibits impressive MOR activity and durability. More importantly, the CoCH–Pt/C catalyst can maintain 40% of its initial activity after 10,000 s of chronopotentiometry and can be fully reactivated by running several CV cycles in 1 M KOH. The incorporation of CoCH is believed to play a major role in facilitating the oxidative removal of COads at adjacent Pt sites, since it can readily promote water dissociation to form OHads in alkaline electrolytes. This finding was confirmed by CO-stripping, impedance spectra and CO poisoning experiments. The bifunctional interaction between Pt and CoCH provides a valuable reference for designing new high-performance MOR electrocatalysts. © 2020
Number of references: 45
Main heading: Cobalt compounds
Controlled terms: Carbon - Catalyst poisoning - Nanorods - Electrooxidation - Platinum - Electrocatalysts - Potassium hydroxide - Cobalt - Durability - Platinum compounds - Methanol
Uncontrolled terms: Alkaline electrolytes - Chronopotentiometry - CO poisoning - Electrocatalytic performance - Methanol electrooxidation - Methanol Oxidation - Methanol oxidation reactions - OHads
Classification code: 547.1 Precious Metals - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 761 Nanotechnology - 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 Solid State Physics
Numerical data indexing: Percentage 4.00e+01%, Time 1.00e+04s
DOI: 10.1016/j.electacta.2020.135751
Funding Details: Number: 2019M653596, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2018 PT-28,2019 PT-05, Acronym: -, Sponsor: -; Number: tywl2019-01, Acronym: -, Sponsor: -; Number: 2019TD-020, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 51901177, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was jointly supported by National Natural Science Foundation of China (Grant No. 51771144 , 51802252 , 51901177), Natural Science Foundation of Shaanxi Province (No. 2019TD-020 , 2019JLM-30), China Postdoctoral Science Foundation (2019M653596), the fund of the Shaanxi Key Laboratory of Surface Engineering and Remanufacturing (tywl2019-01) and innovation Capability Support Program of Shaanxi (No. 2018 PT-28,2019 PT-05). Shengwu Guo contributed to the materials characterization in this work.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

32. Study on failure models and fractal characteristics of shale under seepage-stress coupling (*Open Access*)

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Authors: Lou, Yili (1); Wu, Zhonghu (1); Sun, Wenjibin (2); Yin, Shuai (3, 4); Wang, Anli (5); Liu, Hao (2); Zuo, Yujun (2)
Author affiliation: (1) College of Civil Engineering, Guizhou University, Guiyang, China; (2) Mining College, Guizhou University, Guiyang, China; (3) Shandong Provincial Key Laboratory of Depositional Mineralization & Sedimentary Minerals, Shandong University of Science and Technology, Qingdao, China; (4) School of Earth Science and Engineering, Xi'an Shiyou University, Xi'an, China; (5) Guizhou Province Quality and Safety Traffic Engineering Monitoring and Inspection Center CO., LTD, Guiyang, China
Corresponding author: Wu, Zhonghu(wuzhonghugzu@163.com)
Source title: Energy Science and Engineering
Abbreviated source title: Energy Sci. Eng.

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Issue date: May 1, 2020
Publication year: 2020
Pages: 1634-1649
Language: English
E-ISSN: 20500505
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: The existence of bedding in shale plays an important role in the physical properties and destruction processes of shale. In order to study the failure mechanism of shale with different dip angles under the coupling of seepage and stress, the study uses RFPA2D-Flow software to advance the seepage-stress coupling numerical simulation for seven groups of different bedding direction shale. Research shows that (1) the compressive strength and elastic modulus of shale are significantly affected by the bedding directions. The compressive strength can be observed with the apparent anisotropy of the shale compressive strength with the change of the bedding angle α; the elastic modulus increase with the increase in α as a whole. (2) The ultimate failure mode of shale under different bedding angles can be divided into V type (0°), inverted V type (15°), multi-line type (30°), oblique type I (45°, 90°), and oblique N type (60°, 75°); the failure of shale in each group direction is mainly tensile failure with a small amount of shear failure. It can be found that the spatial distribution of acoustic emission (AE) reflected the macroscopic failure mode of shale. (3) The fractal dimension can well reflect the failure mode of the sample. From the trend of the dip-fractal dimension curve, the fractal dimension of the multi-line type reach to maximum, which is 1.41 699, and the D value of the oblique type I is the smallest, between 1.28 191 and 1.286 181. And the values of the inverted V type, V type and oblique N type, between 1.286 181 and 1.41 699. Therefore, the larger the value is, the more complex the shale failure mode is. © 2020 The Authors. Energy Science & Engineering published by Society of Chemical Industry and John Wiley & Sons Ltd.
Number of references: 51
Main heading: Fractal dimension
Controlled terms: Compressive strength - Numerical models - Acoustic emission testing - Computer software - Failure (mechanical) - Failure modes - Elastic moduli - Seepage - Shale
Uncontrolled terms: Coupling of seepage and stress - Failure mechanism - Fractal characteristics - RFPA2D-Flow softwares - Seepage-stress couplings - Shear failure - Tensile failures - Ultimate failure
Classification code: 723 Computer Software, Data Handling and Applications - 751.2 Acoustic Properties of Materials - 921 Mathematics - 951 Materials Science
DOI: 10.1002/ese3.621
Funding Details: Number: YJSCXJH [2019]033, Acronym: -, Sponsor: -; Number: [2018]1107,[2019]1075, Acronym: -, Sponsor: -; Number: KT201804, Acronym: -, Sponsor: -; Number: 51574093,51774101,51964007, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: [2017]5788#49,[2017]63, Acronym: GZU, Sponsor: Guizhou University; Number: 2016#4011, Acronym: -, Sponsor: Startup Project for High-level Talents of Guizhou Institute of Technology; Number: QYNYL[2017]0013, Acronym: -, Sponsor: Program for First-class Discipline Construction in Guizhou Province;
Funding text: This study was supported by the Talent Introduction Project of Guizhou University (Project No. [2017]63), the Cultivation Project of Guizhou University (Project No. [2017]578849), the Guizhou Science and Technology Fund (Project No. [2019]1075 and [2018]1107), the Guizhou Postgraduate Research Fund (YJSCXJH [2019]033), the Project of Special Fund for Science and Technology of Water Resources Department of Guizhou Province (Project No. KT201804), the Firstclass Discipline Construction Project in Guizhou Province (Project No. QYNYL[2017]0013), the National Natural Science Foundation of China (Project Nos. 51964007, 51574093, and 51774101), and the HighLevel Innovative Talents Training Project in Guizhou Province (Project No. 20164011).This study was supported by the Talent Introduction Project of Guizhou University (Project No. [2017]63), the Cultivation Project of Guizhou University (Project No. [2017]5788-49), the Guizhou Science and Technology Fund (Project No. [2019]1075 and [2018]1107), the Guizhou Postgraduate Research Fund (YJSCXJH [2019]033), the Project of Special Fund for Science and Technology of Water Resources Department of Guizhou Province (Project No. KT201804), the First-class Discipline Construction Project in Guizhou Province (Project No. QYNYL[2017]0013), the National Natural Science Foundation of China (Project Nos. 51964007, 51574093, and 51774101), and the High-Level Innovative Talents Training Project in Guizhou Province (Project No. 2016-4011).
Compendex references: YES
Open Access type(s): All Open Access, Gold
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33. A visual experimental study: Resin-coated ceramic proppants transport within rough vertical models

Accession number: 20201008271880
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Corresponding author: Li, Huazhou(huazhou@ualberta.ca)
Source title: Journal of Petroleum Science and Engineering
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Volume: 191
Issue date: August 2020
Publication year: 2020
Article number: 107142
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Resin-coated ceramic proppants have a thin layer of resin coating on a ceramic body. In this study, we performed experiments to investigate the transport and settling behavior of resin-coated ceramic proppant in three rough vertical fracture models that are replications of different rocks. We studied the effects of the influential factors on the transport behavior of the proppant, including the location of the injection point; proppant, fracturing fluid, and fracture model types; injection rate; particle size; and fracture aperture. Resin-coated ceramic proppant occupied a large area of the fracture when the slurry was injected through the top injection point compared to when it was injected through the bottom injection point. Moreover, the resin-coated ceramic proppant covered a larger area of the fracture than silica sand owing to its higher density. The relative coverage of proppant carried by slickwater was also lower than that of proppant carried by tap water. The larger particle size and additional collisions between the particles and the rough surface of the fracture enabled 20–40 mesh resin-coated ceramic particles to cover more area, compared to 30–50 mesh resin-coated ceramic particles, in the fracture models. When slurry mixed with proppant was injected into fractures with smaller apertures, more collisions occurred between the proppant particles and the fracture surface, slowing the movement of the resin-coated ceramic particles and producing a higher chance of proppant settling and accumulating. Of the three fracture models, the highest relative coverage of resin-coated ceramic proppant was obtained in a replication of coarse-grained white marble, while the lowest relative coverage of resin-coated ceramic proppant was obtained in a replication of beige limestone with abundant coarse fossil shells. © 2020
Number of references: 37
Main heading: Surface roughness
Controlled terms: Lime - Resins - Silica - Particle size - Fracturing fluids - Fracture - Silica sand - Transport properties - Proppants - Mesh generation
Uncontrolled terms: Coated ceramic proppant - Fracture apertures - Influential factors - Larger particle sizes - Proppant transports - Settling behavior - Transport behavior - Vertical-fracture models
Classification code: 511.1 Oil Field Production Operations - 723.5 Computer Applications - 804.2 Inorganic Compounds - 815.1.1 Organic Polymers - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.petrol.2020.107142
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34. Heterogeneous Single-Atom Photocatalysts: Fundamentals and Applications

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Publisher: American Chemical Society
Abstract: Single-atom photocatalysts have shown their compelling potential and arguably become the most active research direction in photocatalysis due to their fascinating strengths in enhancing light-harvesting, charge transfer dynamics, and surface reactions of a photocatalytic system. While numerous comprehensions about the single-atom photocatalysts have recently been amassed, advanced characterization techniques and vital theoretical studies are strengthening our understanding on these fascinating materials, allowing us to forecast their working mechanisms and applications in photocatalysis. In this review, we begin by describing the general background and definition of the single-atom photocatalysts. A brief discussion of the metal-support interactions on the single-atom photocatalysts is then provided. Thereafter, the current available characterization techniques for single-atom photocatalysts are summarized. After having some fundamental understanding on the single-atom photocatalysts, their advantages and applications in photocatalysis are discussed. Finally, we end this review with a look into the remaining challenges and future perspectives of single-atom photocatalysts. We anticipate that this review will provide some inspiration for the future discovery of the single-atom photocatalysts, manifestly stimulating the development in this emerging research area.
Number of references: 159
Main heading: Atoms
Controlled terms: Surface reactions - Charge transfer
Uncontrolled terms: Characterization techniques - Charge-transfer dynamics - Future perspectives - Light-harvesting - Metal-support interactions - Photocatalytic systems - Theoretical study - Working mechanisms
Classification code: 802.2 Chemical Reactions - 931.3 Atomic and Molecular Physics
DOI: 10.1021/acs.chemrev.9b00840
Funding Details: Number: DNL201922, Acronym: -, Sponsor: -; Number: 2017YFA0207301, Acronym: -, Sponsor: -; Number: -, Acronym: CAS, Sponsor: Chinese Academy of Sciences; Number: 51902253,21725102,91961106,91963108,21703220,21601173, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019M652190, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: WK2310000067,WK2060190096, Acronym: -, Sponsor: Chinese Universities Scientific Fund; Number: 2019PC0114, Acronym: CAS, Sponsor: Chinese Academy of Sciences; Number: QYZDB-SSW-SLH018, Acronym: -, Sponsor: -;
Funding text: This work was supported by the National Key R&D Program of China (2017YFA0207301), NSFC (21725102, 91961106, 91963108, 21703220, 21601173, 51902253), CAS Key Research Program of Frontier Sciences (QYZDB-SSW-SLH018), CAS Interdisciplinary Innovation Team, DNL Cooperation Fund, CAS (DNL201922), Chinese Academy of Sciences President's International Fellowship Initiative (2019PC0114), China Postdoctoral Science Foundation (2019M652190) and Chinese Universities Scientific Fund (WK2310000067, WK2060190096).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

35. Status and prospect of oil recovery from oily sludge:A review (*Open Access*)

Accession number: 20202708903681
Authors: Hui, Kunlong (1, 2); Tang, Jun (2); Lu, Haojie (2); Xi, Beidou (1, 2); Qu, Chengtun (3); Li, Juan (2, 4)
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Pages: 6523-6543
Language: English
ISSN: 18785352
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Oily sludge is a kind of solid emulsified waste produced by the petroleum industry. It is generally composed of water, crude oil, and solid particulate matter. Because it contains large amounts of cycloalkanes, benzene series, polycyclic aromatic hydrocarbons, and other toxic and harmful substances, it poses a substantial threat to human health and the surrounding environment; therefore, it must be treated to reduce its toxicity. However, a large component of oily sludge is crude oil, which has great recycling value. Therefore, various crude oil recovery technologies, such as solvent extraction, pyrolysis, centrifugation, ultrasonic treatment, electronal treatment, flotation, supercritical treatment, and combined processes, have been developed for the treatment of oily sludge. The main purpose of this review is to discuss the development of these recycling technologies and to summarize and compare their advantages, disadvantages, and mechanisms of action. On this basis, the future development direction of recycling technology is prospected. © 2020 The Authors
Number of references: 113
Main heading: Crude oil
Controlled terms: Emulsification - Flotation - Solvent extraction - Petroleum industry - Recycling - Gasoline - Mineral oils - Polycyclic aromatic hydrocarbons - Metal recovery - Health risks
Uncontrolled terms: Development directions - Harmful substances - Oil-recovery technology - Recycling technology - Solid particulates - Status and prospect - Surrounding environment - Ultrasonic treatments
Classification code: 452.3 Industrial Wastes - 461.7 Health Care - 512.1 Petroleum Deposits - 513.3 Petroleum Products - 523 Liquid Fuels - 802.3 Chemical Operations - 804.1 Organic Compounds
DOI: 10.1016/j.arabjc.2020.06.009
Funding Details: Number: 2018ZX07109-001, Acronym: -, Sponsor: -; Number: -, Acronym: -, Sponsor: State Key Joint Laboratory of Environmental Simulation and Pollution Control; Number: -, Acronym: CRAES, Sponsor: Chinese Research Academy of Environmental Sciences; Number: -, Acronym: -, Sponsor: China National Critical Project for Science and Technology on Water Pollution Prevention and Control;
Funding text: The financial support by National Water Pollution Control and Management TechnologyMajor Project of China (2018ZX07109-001), and State Environmental Protection Key Laboratory of Simulation and Control of Groundwater Pollution, Chinese Research Academy of Environmental Sciences. The authors thank the reviewers for their constructive suggestion.The financial support by National Water Pollution Control and Management TechnologyMajor Project of China (2018ZX07109-001), and State Environmental Protection Key Laboratory of Simulation and Control of Groundwater Pollution, Chinese Research Academy of Environmental Sciences . The authors thank the reviewers for their constructive suggestion.
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Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

36. Direct numerical simulation of particle pore-scale transport through three-dimensional porous media with arbitrarily polyhedral mesh

Accession number: 20201708504918
Authors: Su, Junwei (1); Chai, Guoliang (1); Wang, Le (2); Yu, Jinbiao (3); Cao, Weidong (3); Gu, Zhaolin (1); Chen, Chungang (4); Meng, Wei (1, 3)
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CODEN: POTEBX
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: A new direct numerical simulation algorithm is developed for particle pore-scale transport through the porous media with arbitrarily polyhedral mesh. In the algorithm, the Navier-Stokes Equation is used to describe the continuous phase motion in the Eulerian framework; Newton's Second Law is used to describe the particle dynamics in the Lagrangian framework; Discrete element method is used to describe the particle-particle interactions and particle-wall interactions; RIGID is used to detect the contact state between particles with arbitrarily shaped pore walls. To suppress the spurious force oscillations (SFO) and improve the numerical accuracy of the evaluation of fluid-particle interaction, a novel consistent fictitious domain method (CFDM) in the arbitrarily collocated polyhedral mesh is developed. Numerical results of six test cases show that CFDM is accurate and second order in space, and no obvious SFO is found. Finally, the new direct numerical simulation algorithm is used to simulate the particle transport through three-dimensional porous media reconstructed from micro-CT scans from a real rock. The numerical results of a serial of tests with different particle sizes reveal several distinct microscopic flow mechanisms and the corresponding macroscopic characteristics. The change of channel resistance leads to the formation of particle motion paths in succession; Along a certain motion path, the particle moving velocity can be different at different sites; With the increase of particle size, the particle average retention time and particle average transit time increase; Particle velocity presents lognormal distribution, which becomes wider with the increase of particle size. The newly developed algorithm can be adopted as a direct numerical simulation tool to simulate particle motion in arbitrarily complex pore space. © 2020 Elsevier B.V.
Number of references: 47
Main heading: Direct numerical simulation
Controlled terms: Velocity control - Numerical models - Particle size - Computerized tomography - Mesh generation - Navier Stokes equations - Numerical methods - Porous materials
Uncontrolled terms: Different particle sizes - Fictitious domain method - Fluid-particle interaction - Lagrangian frameworks - Log-normal distribution - Particle velocities - Particle-particle interactions - Particle-wall interactions
Classification code: 631.1 Fluid Flow, General - 723.5 Computer Applications - 731.3 Specific Variables Control - 921 Mathematics - 921.2 Calculus - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods - 951 Materials Science
DOI: 10.1016/j.powtec.2020.04.007
Funding Details: Number: 21306145, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-335, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2016ZX05011003, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: -, Acronym: -, Sponsor: Science and Technology Major Project of Guangxi;
Funding text: This work is supported by National Science and Technology Major Project (No. 2016ZX05011003), National Natural Science Foundation of China (No. 21306145) and Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-335).This work is supported by National Science and Technology Major Project (No. 2016ZX05011003), National Natural Science Foundation of China (No. 21306145) and Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-335).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

37. A comparable study of Fe//MCs (M = Ti, V) interfaces by first-principles method: The chemical bonding, work of adhesion and electronic structures

Accession number: 20194907789381
Authors: Chen, Lu (1); Li, Yefei (1); Peng, Jianhong (2); Sun, Liang (3); Li, Bo (1); Wang, Zhicheng (4); Zhao, Siyong (5)

Author affiliation: (1) State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, Xi'an; 710049, China; (2) College of Physics and Electronic Information Engineering, Qinghai Nationalities University, Xi'ning; 810007, China; (3) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (4) Yancheng Jiuheng Industry & Trade Co., Ltd, Yanchen; 224021, China; (5) Guangxi Great Wall Machineries, Hezhou; 542699, China
Corresponding author: Li, Yefei(liyefei@xjtu.edu.cn)
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Publication year: 2020
Article number: 109292
Language: English
ISSN: 00223697
CODEN: JPCSAW
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The work of adhesion (Wad), interfacial fracture toughness (KIcint), and electronic structure of the Fe(100)//MCs(100) (M = Ti and V) interfaces have been investigated by means of first-principles calculations. Considering two types of interfaces (type 1 and 2), two MCs (TiC and VC) and three different atomic stacking sequences (Fe-on-M, Fe-on-C and Bridge), totally twelve candidate interfacial configurations were analyzed. It is found that the Wad decreases with the order of Fe-on-C > Bridge > Fe-on-M. With the larger Wad, the type 2 Fe//MCs interfaces are more stable than type 1 Fe//MCs interfaces, in which the Fe-on-C site for type 2 Fe//VC interfaces belongs to the most stable interfacial configuration. Based on the Griffith's theory, the mechanical failure of both type 1 and type 2 Fe//TiC interfaces are more inclined to initiate at the interface. While for the Fe-on-C and Bridge site of both type 1 and type 2 Fe//VC interfaces, the mechanical failure will occur at the VC bulk phases rather than at the interface. Besides, the interfacial fracture toughness of Fe-on-C site for the type 2 Fe//VC structure is the best. The interfacial bonding character of Fe-on-C site for both Fe//TiC and Fe//VC interfaces have been investigated based on the electronic density of states and charge density difference. A mixed covalent/ionic/metallic bonding is revealed between iron and transition metal carbides. Further analysis of mulliken population and magnetic moment of interfacial atoms indicates that the Fe//VC interfaces show higher bonding strength than Fe//TiC interfaces. © 2019 Elsevier Ltd
Number of references: 46
Main heading: Fracture toughness
Controlled terms: Density functional theory - Interface states - Magnetic moments - Titanium carbide - Interfaces (materials) - Transition metals - Calculations - Adhesion - Chemical stability - Iron compounds - Chemical bonds - Electronic structure
Uncontrolled terms: Charge density difference - First principles method - First-principles calculation - Interfacial configurations - Interfacial fracture toughness - Interfacial stabilities - Transition metal carbide - Work of adhesion
Classification code: 531 Metallurgy and Metallography - 701.2 Magnetism: Basic Concepts and Phenomena - 801 Chemistry - 801.4 Physical Chemistry - 804.2 Inorganic Compounds - 921 Mathematics - 922.1 Probability Theory - 931 Classical Physics; Quantum Theory; Relativity - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 932 High Energy Physics; Nuclear Physics; Plasma Physics - 951 Materials Science
DOI: 10.1016/j.jpcs.2019.109292
Funding Details: Number: GUIKEAA18242001, Acronym: -, Sponsor: -; Number: 2019B010942001, Acronym: -, Sponsor: -; Number: 2018M631152,2018T111051, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2018JM5002, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: -, Sponsor: Shaanxi Province Postdoctoral Science Foundation; Number: xtr0118008,xzy012019001, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: 2015DFR50990, Acronym: ISTCP, Sponsor: International Science and Technology Cooperation Programme; Number: 2019GY-182, Acronym: -, Sponsor: Key Research and Development Program of Jiangxi Province;
Funding text: This work was funded by the International Science and Technology Cooperation Program of China (2015DFR50990), the Key-Area Research and Development Program of GuangDong Province (2019B010942001), the Natural Science Foundation of Shaanxi Province of China (2018JM5002), the Key Research and Development Program of Shaanxi Province (2019GY-182), the China Postdoctoral Science Foundation (2018M631152 , 2018T111051), the Shaanxi Province Postdoctoral Science Foundation , the Fundamental Research Funds for the Central Universities of China (xzy012019001 , xtr0118008), the Guangxi Innovation Driven Development Project (GUIKEAA18242001). Appendix AThis work was funded by the International Science and Technology Cooperation Program of China (2015DFR50990), the Key-Area Research and Development Program of GuangDong Province (2019B010942001), the Natural Science Foundation of Shaanxi Province of China (2018JM5002), the Key Research and Development Program of Shaanxi Province (2019GY-182), the China Postdoctoral Science Foundation

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

38. A comprehensive experimental of degradation of pollutants in oil fields by sodium persulfate (*Open Access*)

Accession number: 20201608458796
Authors: Zhang, Zhifang (1); Xue, Yuying (2); Dong, Sanbao (2); Tang, Ying (2, 3); Xiang, Yulin (1)
Author affiliation: (1) Yulin Key Laboratory of Green Chemistry and Green Chemical Engineering, Yulin University, Yulin Shaanxi; 719000, China; (2) Shaanxi Prov. Key Lab. of Environ. Poll. Control and Reservoir Protection Technology of Oilfields, Xi'an Shiyou University, Xi'an Shaanxi; 710065, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing; 102206, China
Corresponding author: Zhang, Zhifang(zhifang889@sohu.com)
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Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 450
Part number: 1 of 1
Issue: 1
Issue title: 2nd International Conference on Air Pollution and Environmental Engineering
Issue date: March 23, 2020
Publication year: 2020
Article number: 012054
Language: English
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Conference name: 2nd International Conference on Air Pollution and Environmental Engineering, APEE 2019
Conference date: December 15, 2019 - December 16, 2019
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Conference code: 158840
Publisher: IOP Publishing Ltd
Abstract: A comprehensive experiment of Fenton-like method was designed to degrade oilfield pollutants. The effects of sodium persulfate on viscosity reduction of oilfield pollutants under different reaction conditions were investigated. The emphasis was put on the determination of viscosity, and the method of data processing should be learned to optimize the best viscosity reduction scheme. The experimental content can be closely combined with the basic theoretical knowledge of Applied Chemistry in oilfields, and can be applied to field practice. It helps students to understand the role of viscosity reducers and improve their functional ability of applying chemical knowledge. At the same time, the degradation and treatment methods of oilfield pollutants meet the requirements of green chemistry and enable students to establish environmental protection concept. © Published under licence by IOP Publishing Ltd.
Number of references: 15
Main heading: Sodium compounds
Controlled terms: Oil fields - Data handling - Viscosity - Degradation - Pollution - Sustainable chemistry
Uncontrolled terms: Applied chemistry - Degradation of pollutants - Functional abilities - Reaction conditions - Sodium persulfate - Treatment methods - Viscosity reducer - Viscosity reduction
Classification code: 512.1.1 Oil Fields - 631.1 Fluid Flow, General - 723.2 Data Processing and Image Processing - 802.2 Chemical Reactions - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1088/1755-1315/450/1/012054
Funding Details: Number: YCS18221010, Acronym: -, Sponsor: -; Number: 2017ZDXM-SF-101,2019SF-273, Acronym: -, Sponsor: -; Number: 2019-23, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: Someresearchresultsareformthemaster'sthesisofXi'anShiyouUniversity.Thisworkwasfinancially supportedbythegrantsfromNationalScienceFoundationofChina(21763030),ShannxiScienceand Technology Planning Project (2017ZDXM-SF-101 and 2019SF-273) and the grants from Education Innovation Project of Xi'an Shiyou University (2019-23) and the grants from Education Innovation ProjectofXi'anShiyouUniversity(YCS18221010).
Compendex references: YES
Open Access type(s): All Open Access, Bronze

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Data Provider: Engineering Village

39. Performance evaluation and mechanism with different CO2 flooding modes in tight oil reservoir with fractures

Accession number: 20200408063892
Authors: Zhang, Juan (1, 2); Zhang, Hui Xiao (3); Ma, Li Yan (3); Liu, Yi (4); Zhang, Liang (5)
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Corresponding author: Zhang, Juan(562142774@qq.com)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 188
Issue date: May 2020
Publication year: 2020
Article number: 106950
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Due to the abundant reserves in tight reservoirs and the large amounts of residual oil after implementing common enhanced oil recovery methods, profitable methods with a high oil recovery such as CO2 flooding are urgently needed. Although CO2 flooding has attracted much attention and obtained good results in China and abroad, it has the critical problem of a low sweep efficiency, especially in tight reservoirs that develop with hydraulic fractures. In this study, the minimum miscible pressure of oil and CO2 was measured as 17.8 MPa, higher than the original formation pressure. Subsequently, the minimum miscible pressure was matched by means of numerical simulation, and the method of adding intermediate components to the injection CO2 was studied to reduce the miscible pressure in the study area. Afterwards, fractures were added to the geological model to study the mechanism of gas channeling under different CO2 injection modes. The continuous CO2 injection (CGI) mode requires the largest gas injection volume, which is easily affected by fractures and production pressure differences to form irregular gas channeling. Soaking alternating gas injection (SAG) can effectively supplement the formation pressure through periodic well switching, gas channeling delay, and radial gas flooding pattern formation. Water alternating CO2 (WAG) flooding can delay gas channeling, and the rhombus or square gas flooding pattern is formed due to the influence of the well pattern and well spacing. Foam flooding can better mitigate gas channeling but has a poor displacement effect. Through comparison of the various gas injection modes, it is concluded that WAG is the best CO2 flooding mode in the research area, and the cumulative increase in oil over 20 years can reach 390,466 t. The outcome of this work is important to CO2 flooding in tight reservoirs with fractures. The CO2 flooding mechanism in tight reservoir with fractures was examined. © 2020 Elsevier B.V.
Number of references: 62
Main heading: Carbon dioxide
Controlled terms: Petroleum reservoir engineering - Reservoirs (water) - Fracture - Enhanced recovery - Proven reserves - Well spacing - Gases - Numerical methods - Oil well flooding - Petroleum reservoirs - Floods
Uncontrolled terms: Critical problems - Enhanced oil recovery - Flooding mechanism - Formation pressure - Geological modeling - Intermediate components - Production pressure differences - Tigh treservoirs
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 804.2 Inorganic Compounds - 921.6 Numerical Methods - 951 Materials Science
Numerical data indexing: Age 2.00e+01yr, Pressure 1.78e+07Pa
DOI: 10.1016/j.petrol.2020.106950
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Funding text: The authors would like to acknowledge National science and technology support program (2014KTZB03-02), and the editor.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

40. Deformation behaviors of four-layered U-shaped metallic bellows in hydroforming (*Open Access*)

Accession number: 20201508396756
Authors: LIU, Jing (1, 2); LV, Zhiyong (1); LIU, Yang (3); LI, Lanyun (1)
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Issue date: December 2020
Publication year: 2020
Pages: 3479-3494
Language: English
ISSN: 10009361
CODEN: CJAEEZ
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Because of the complex constraint effects among layers in multi-layered metallic bellows hydroforming, the stress concentration and defects such as wrinkling and fracture may easily occur. It is a key to reveal the deformation behaviors in order to obtain a sound product. Based on the ABAQUS platform, a 3D-FE model of the four-layered U-shaped metallic bellow hydroforming process is established and validated by experiment. The stress and strain distributions, wall thickness variations and bellow profiles of each layer in the whole process, including bulging, folding and springback stages, are studied. Then deformation behaviors of bellows under different forming conditions are discussed. It is found that the wall thinning degrees of different layer vary after hydroforming, and is the largest for the inner layer and smallest for the outer layer. At folding stage, the wall thinning degree of the crown point increases lineally, and the difference among layers increases as the process going. The displacements of the crown point decrease from the inner layer to the outer layer. After springback, the U-shaped cross section changes to a tongue shape, the change of convolution pitch is much larger than the change of convolution height, and the springback values of the inner layer are smaller than the outer layer. An increase in the internal pressure and die spacing cause the maximum wall thinning degree and springback increase. With changing of process parameters, bellows with deep convolution are easily encountered wall thinning during hydroforming and convolution distortion after springback. This research is helpful for precision forming of multi-layered bellows. © 2020 Chinese Society of Aeronautics and Astronautics
Number of references: 26
Main heading: Bellows
Controlled terms: Convolution - 3D modeling - Metal forming - Deformation - Strain
Uncontrolled terms: Complex constraints - Deformation behavior - Hydroforming - Hydroforming process - Process parameters - Spring-back - Stress and strain distribution - U shaped bellows
Classification code: 535.2 Metal Forming - 601.2 Machine Components - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 951 Materials Science
DOI: 10.1016/j.cja.2020.02.007
Funding Details: Number: 2015QNKYCXTD02, Acronym: -, Sponsor: -; Number: 51875456, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018KLMT03, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: -, Acronym: CQUT, Sponsor: Chongqing University of Technology; Number: 2019JM-450, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 20170518, Acronym: SUST, Sponsor: Shaanxi University of Science and Technology; Number: -, Acronym: -, Sponsor: Shanxi Key Laboratory of Advanced Manufacturing Technology;
Funding text: The authors would like to thank the funds of the National Natural Science Foundation of China (No. 51875456), the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2019JM-450), the Young Talent fund of University Association for Science and Technology in Shaanxi, China (No. 20170518), the Key Laboratory of Advanced Manufacture Technology for Automobile Parts (Chongqing University of Technology) , Ministry of Education (No. 2018KLMT03), Materials Science and Engineering provincial-level superior discipline funding project of Xi’an Shiyou University, and the Program for Young Innovative Research Team in Xi’an Shiyou University (No.

2015QNKYCXTD02).The authors would like to thank the funds of the National Natural Science Foundation of China (No. 51875456), the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2019JM-450), the Young Talent fund of University Association for Science and Technology in Shaanxi, China (No. 20170518), the Key Laboratory of Advanced Manufacture Technology for Automobile Parts (Chongqing University of Technology), Ministry of Education (No. 2018KLMT03), Materials Science and Engineering provincial-level superior discipline funding project of Xi'an Shiyou University, and the Program for Young Innovative Research Team in Xi'an Shiyou University (No. 2015QNKYCXTD02).
Compendex references: YES
Open Access type(s): All Open Access, Hybrid Gold
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41. Design of a comprehensive experiment of the synthesis of biodiesel catalyzed by CaO (*Open Access*)

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Authors: Zhang, Zhifang (1); Liu, Huan (2); Tang, Ying (2, 3); Xiang, Yulin (1); Gao, Wenwen (1)
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Corresponding author: Zhang, Zhifang(zhifang889@sohu.com)
Source title: IOP Conference Series: Earth and Environmental Science
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Volume: 450
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Issue title: 2nd International Conference on Air Pollution and Environmental Engineering
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Publication year: 2020
Article number: 012055
Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 2nd International Conference on Air Pollution and Environmental Engineering, APEE 2019
Conference date: December 15, 2019 - December 16, 2019
Conference location: Xi'an, China
Conference code: 158840
Publisher: IOP Publishing Ltd
Abstract: An applied chemistry comprehensive experiment has been designed using CaO for synthesis of biodiesel. Effects of calcination temperature, methanol concentration, reaction temperature, reaction time and amount of catalyst on transesterification reaction are investigated. Based on experiment, the relationship between the catalyst structure and its properties was analyzed. Furthermore, this experiment can cultivate student's abilities of analyzing and solving problem. And it can build up the innovation consciousness, competition and team spirit of students. At the same time, the biodiesel and its preparation are line with the development requirements of green chemistry, so that students can establish environmental protection concept. © Published under licence by IOP Publishing Ltd.
Number of references: 16
Main heading: Biodiesel
Controlled terms: Students - Transesterification - Catalysts
Uncontrolled terms: Applied chemistry - Calcination temperature - Catalyst structures - Green chemistry - Methanol concentration - Reaction temperature - Team spirit - Transesterification reaction
Classification code: 523 Liquid Fuels - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds
DOI: 10.1088/1755-1315/450/1/012055
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

42. Effect of inorganic salt on foam properties of nanoparticle and surfactant systems

Accession number: 20204109303053
Authors: Wang, Yang (1); Wang, Jian (1); Fan, Hongwei (1); Du, Fenfen (2); Zhou, Wenchao (3); Yang, Jiang (1)
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Corresponding authors: Wang, Yang(ywang@xsyu.edu.com); Yang, Jiang(jyang98@126.com)
Source title: Tenside, Surfactants, Detergents
Abbreviated source title: Tenside Surfactants Deterg
Volume: 57
Issue: 5
Issue date: September 2020
Publication year: 2020
Pages: 382-388
Language: English
ISSN: 09323414
CODEN: TSDEES
Document type: Journal article (JA)
Publisher: Carl Hanser Verlag
Abstract: We have studied the effect of NaCl and CaCl2on phase behavior of foaming aqueous dispersions containing mixtures of silica nanoparticles (Ludox CL) and sulfobetaine (LHSB). At the evaluated ratio, the phase behavior results show that at a low CaCl2 concentration, sedimentation occurs, whereas a stable aqueous dispersion could be achieved when the CaCl2concentration reaches to 20%. The adsorption experiments show that high concentrations of both NaCl and CaCl2reduce the adsorption of LHSB to CL. In the CaCl2dispersion the adsorption decreases significantly and only a few LHSB molecules can be adsorbed on the CL surface. Therefore, without the lower hydrophobicity of LHSB adsorption less CL could adsorbed at the air/water interface. The results on gas permeability show that aqueous dispersions containing mixtures of CL and LHSB show no obvious difference to aqueous systems containing only LHSB. The surface dilatation module of the LHSB and CL system in CaCl2solution also shows a similar variation to the system with LHSB alone, which is significantly different from the system with 20% NaCl. Finally, foam flow tests in a porous medium show that compared to a 20% CaCl2dispersion with the LHSB and CL system in 20% NaCl, a finer foam and a higher pressure difference could be achieved.
Number of references: 33
Main heading: Mixtures
Controlled terms: Gas permeability - Adsorption - Porous materials - Phase interfaces - Silica nanoparticles - Sodium chloride
Uncontrolled terms: Adsorption experiment - Air/Water Interfaces - Aqueous dispersions - Foam properties - Inorganic salts - Lower hydrophobicity - Pressure differences - Surfactant system
Classification code: 761 Nanotechnology - 801.4 Physical Chemistry - 802.3 Chemical Operations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 2.00e+01%
DOI: 10.3139/113.110698
Funding Details: Number: 51574266,51474234, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: Financial support by the National Natural Science Foundation of China (51574266 and 51474234) are gratefully acknowledged.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

43. Mg0.8Zn0.2O microspheres: Preparation, characterization and application for degrading organic dyes

Accession number: 20200908210956
Authors: Zheng, Yajun (1, 2); Cao, Liyun (2); Xing, Gaoxuan (1); Huang, Jianfeng (2); Zhang, Zhiping (1, 3)
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Material Science and Engineering, Shaanxi University of Science and Technology, Xi'an; 710021, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing; 102206, China
Source title: CrystEngComm
Abbreviated source title: Crystengcomm
Volume: 22
Issue: 7
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Publication year: 2020
Pages: 1273-1285
Language: English
E-ISSN: 14668033
CODEN: CRECF4
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Photocatalytic degradation of organic pollutants in wastewater is one of the most promising strategies for environmental remediation, and photocatalysts as the prerequisite have received considerable attention. Herein we reported highly efficient, nontoxic, and inexpensive Mg0.8Zn0.2O microspheres with a diameter of around 36 μm prepared through reaction between CO32-, Mg2+ and Zn2+ for degrading organic dyes. The molar ratio between Mg2+ and Zn2+ was found to play a crucial role in determining the morphology and photocatalytic performance of the resulting product. According to time-dependent experiments, the plausible formation mechanism for the spherical-like Mg0.8Zn0.2O composite was proposed, in which irregular agglomerates composed of fine powders were first formed followed by their transformation into rod-like structures. Due to their thermal instability, the rod-like particles underwent further self-assembly and became a more stable spherical-like product with ZnCO3 embedded in the space between Mg5(CO3)4(OH)2·4H2O sheets. After investigating the photocatalytic performance, the results demonstrated that the developed Mg0.8Zn0.2O composite was not only superior to other state-of-the-art catalysts such as P25 TiO2 and g-C3N4 in degrading organic dyes upon irradiation under either UV light or visible light, but also was an amphoteric photocatalyst more favorable for degrading organic dyes in both strongly acidic (pH 2-4) and strongly alkaline (pH 12) solutions. Moreover, its catalytic efficiency remained as high as 98.3% after six cycles. These features made the developed Mg0.8Zn0.2O composite promising in practical utilization for treatment of organic dyes. Further experiments including photoluminescence, adsorption and photoelectrochemical measurements accounted for the underlying photocatalytic mechanism of the Mg0.8Zn0.2O composite for degradation of organic dyes. This journal is © The Royal Society of Chemistry.
Number of references: 78
Main heading: Microspheres
Controlled terms: Magnesium compounds - Molar ratio - Organic pollutants - Photocatalytic activity - Titanium dioxide - Thermodynamic stability - Zinc compounds - Alkalinity - Light
Uncontrolled terms: Catalytic efficiencies - Degradation of organic dyes - Environmental remediation - Formation mechanism - Photo catalytic degradation - Photocatalytic performance - Photoelectrochemical measurements - Thermal instabilities
Classification code: 641.1 Thermodynamics - 741.1 Light/Optics - 801.1 Chemistry, General - 801.4 Physical Chemistry - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 9.83e+01%, Size 3.60e-05m
DOI: 10.1039/c9ce01717h
Funding Details: Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JC-33, Acronym: -, Sponsor: -;
Funding text: The authors would like to acknowledge funding support from the National Natural Science Foundation of China (Grant No.21575112, 21777128, and 21705125) and the Natural Science Basic Research Program of Shaanxi Province of China (Grant No. 2019JC-33).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

44. VSP-CDP stack imaging based on the weight function of normal distribution

Accession number: 20201208317789
Title of translation: VSP-CDP
Authors: Yang, Feilong (1, 2); Li, Huifeng (1); Sun, Hui (3, 4); Zhang, Xue (1); Luo, Hao (1); Zhao, Chi (1)
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Source title: Shiyou Diqiu Wuli Kantan/Oil Geophysical Prospecting
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Publication year: 2020
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Language: Chinese
ISSN: 10007210
CODEN: SDWKEP
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Limited by the geometry, the imaging sections based on migration imaging technique have serious "arc phenomenon" at the edge.VSP-CDP stack imaging method based on ray tracing can realize amplitude-preserved VSP imaging.However, it is difficult to obtain accurate structural imaging and velocity model in complex structure situation.Therefore, a non-zero-offset VSP stack imaging method was proposed in this paper, based on dynamic ray tracing effective neighborhood wave field approximation theory.By studying the nature and characteristics of normal distribution, the weight function based on normal distribution stack was derived and used in VSP stack imaging.All the sampling points in depth-time domain were converted into multiple sampling points of reflection points in offset-depth domain, in order to uniform the fold times of reflection points.Model test and the application in real data demonstrated that the VSP-CDP stack imaging method based on normal distribution weight function improved the VSP imaging precision.
Number of references: 23
Main heading: Normal distribution
Controlled terms: Distribution functions - Ray tracing - Time domain analysis
Uncontrolled terms: Complex structure - Dynamic ray tracing - Imaging sections - Migration imaging - Multiple sampling - Reflection points - Structural imaging - Weight functions
Classification code: 741.1 Light/Optics - 921 Mathematics - 922.1 Probability Theory
DOI: 10.13810/j.cnki.issn.1000-7210.2020.01.012
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

45. Evaluation of methods for determining rock brittleness under compression

Accession number: 20201708572817
Authors: Tao, Wen (1, 2); Tang, Huiming (3, 4); Wang, Yankun (3); Ma, Junwei (4)
Author affiliation: (1) School of Geosciences, Yangtze University, Wuhan; Hubei; 430100, China; (2) The Key Laboratory of Well Stability and Fluid & Rock Mechanics in Oil and Gas Reservoir of Shaanxi Province, Xi'an Shiyou University, Xi'an; 710065, China; (3) Faculty of Engineering, China University of Geosciences, Wuhan; Hubei; 430074, China; (4) Three Gorges Research Center for Geohazards, Ministry of Education, China University of Geosciences, Wuhan; Hubei; 430074, China
Corresponding author: Tang, Huiming(tanghm@cug.edu.cn)
Source title: Journal of Natural Gas Science and Engineering
Abbreviated source title: J. Nat. Gas Sci. Eng.
Volume: 78
Issue date: June 2020
Publication year: 2020
Article number: 103321
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Accurate assessment of brittleness of rock material is of great significance in the fields of underground mining engineering and unconventional oil and gas reservoirs. In this study, the existing methods for determining rock brittleness were reviewed in detail. Nevertheless, they encounter their own limitations in dealing with some

special situations. Therefore, two brittleness indexes under compression are proposed based on energy evolution analysis in the complete process of deformation and failure of the rock. The proposed brittleness indexes consider the elastic strain energy and the dissipation energy before peak strength (PS) and the influence of post-peak stress drop. Then, the applicability of the proposed brittleness indexes is validated by the collected datasets of uniaxial and triaxial compression tests results under different confinements for ten rock types. The results indicate that the values of two proposed indexes have positive correlations with confining pressure while have negative correlations with the rock brittleness. Finally, seven brittleness indexes are selected to further compare the rationality of the proposed brittleness indexes. The comparisons show that the results determined by the two brittleness indexes are different from other brittleness indexes while they can also describe the brittle characteristics of each rock types. The comparisons also prove either insufficient physical basis or inappropriate expression strategy in the existing brittleness indexes. Accordingly, the proposed methods for determining the rock brittleness seem to offer reliable evaluations of the rock brittleness in various rock types. This study provides a novel approach for quantitative evaluation of the rock brittleness, the results of which improve the existing methods and also enrich our understanding of the rock brittleness.
Number of references: 84
Main heading: Stress-strain curves
Controlled terms: Rocks - Brittleness - Petroleum reservoir engineering - Energy dissipation - Failure (mechanical) - Plasticity - Compression testing - Fracture mechanics - Mining engineering - Strain energy
Uncontrolled terms: Deformation and failures - Elastic strain energy - Evaluation of methods - Negative correlation - Positive correlations - Quantitative evaluation - Tri-axial compression tests - Unconventional oil and gas
Classification code: 506 Mining Engineering, General - 512.1.2 Petroleum Deposits : Development Operations - 525.4 Energy Losses (industrial and residential) - 931.1 Mechanics - 951 Materials Science
DOI: 10.1016/j.jngse.2020.103321
Funding Details: Number: HKLBEF202012, Acronym: -, Sponsor: -; Number: WSFRM20190101001, Acronym: -, Sponsor: -; Number: D2019038, Acronym: -, Sponsor: Hubei Provincial Department of Education; Number: 2018M642799, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2017YFC1501305, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: The work was funded by the National Key R&D Program of China (2017YFC1501305), China Postdoctoral Science Foundation (grant number 2018M642799), Science and Technology Research Project of Hubei Education Department (D2019038), Open Foundation of Top Disciplines in Yangtze University and the Key Laboratory of Well Stability and Fluid & Rock Mechanics in Oil and Gas Reservoir of Shaanxi Province, Xi'an Shiyou University (No. WSFRM20190101001). Open Foundation of Hubei Key Laboratory of Blasting Engineering (HKLBEF202012).The work was funded by the National Key R&D Program of China (2017YFC1501305), China Postdoctoral Science Foundation (grant number 2018M642799), Science and Technology Research Project of Hubei Education Department (D2019038), Open Foundation of Top Disciplines in Yangtze University and the Key Laboratory of Well Stability and Fluid & Rock Mechanics in Oil and Gas Reservoir of Shaanxi Province , Xi'an Shiyou University (No. WSFRM20190101001). Open Foundation of Hubei Key Laboratory of Blasting Engineering (HKLBEF202012).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

46. Hollow PtCu nanoparticles encapsulated into a carbon shell: Via mild annealing of Cu metal-organic frameworks

Accession number: 20202408807967
Authors: Chen, Guanjun (1); Shan, Huaqiang (1); Li, Yan (1); Bao, Hongwei (1); Hu, Tingwei (2); Zhang, Long (3); Liu, Shuai (4); Ma, Fei (1)
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Corresponding author: Ma, Fei(mafei@mail.xjtu.edu.cn)
Source title: Journal of Materials Chemistry A
Abbreviated source title: J. Mater. Chem. A
Volume: 8
Issue: 20

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Publication year: 2020
Pages: 10337-10345
Language: English
ISSN: 20507488
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CODEN: JMCAET
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Alloying Pt with less expensive 3d transition metals to form bimetallic nanoparticles (NPs) has been proven to be an ideal strategy for the synthesis of catalysts, especially in the field of electrocatalysis. Unfortunately, these low-price 3d transition metals are easily leached from the alloy, thereby resulting in insufficient catalyst durability. To overcome this challenge as well as enhance the activity and durability of the alloy catalyst, spherical hollow PtCu nanoparticles (NPs) are encapsulated into a carbon shell via mild annealing of Cu metal-organic frameworks (S-H-PtxCuy@C). The carbon shell can effectively prevent the degradation and thus stabilize the PtCu alloy, and the hollow structure of PtCu NPs might enhance the activity. Consequently, the as-prepared S-H-PtxCuy@C catalysts exhibit excellent electrocatalytic performance toward the methanol oxidation reaction (MOR). Impressively, the S-H-PtCu@C catalyst can retain over 84% (444.3 mA mg-1) of its initial activity after 20 000 s durability measurement. Theoretical calculations reveal that the electron transfer between Cu and Pt results in electron redistribution, thereby weakening the binding strength of the adsorbate (e.g. COads) on Pt atoms and thus enhancing the MOR activity. The significance of this work is that it not only provides valuable information for the future design of highly robust alloy catalysts, but also sheds light on the development of MOF-derived functional nanomaterials. © 2020 The Royal Society of Chemistry.
Number of references: 45
Main heading: Binary alloys
Controlled terms: Electrocatalysis - Platinum alloys - Carbon - Copper - Metal nanoparticles - Durability - Metal-Organic Frameworks - Platinum - Copper alloys - Synthesis (chemical)
Uncontrolled terms: 3d transition metals - Bimetallic nanoparticles - Electrocatalytic performance - Electron transfer - Functional Nano materials - Methanol oxidation reactions - Nanoparticle (NPs) - Theoretical calculations
Classification code: 531.1 Metallurgy - 544.1 Copper - 544.2 Copper Alloys - 547.1 Precious Metals - 761 Nanotechnology - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.1 Organic Compounds
DOI: 10.1039/d0ta01549k
Funding Details: Number: 2018PT-28,2019PT-05, Acronym: -, Sponsor: -; Number: 51771144,51901177, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019M653596, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2019JLM-30,2019TD-020,2020JQ-386, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This work was supported nancially by the National Natural Science Foundation of China (Grant No. 51771144 and 51901177), Natural Science Foundation of Shaanxi Province (No. 2019TD-020, 2019JLM-30 and 2020JQ-386), China Postdoctoral Science Foundation (2019M653596), and Innovation Capability Support Program of Shaanxi (No. 2018PT-28 and 2019PT-05). The DFT calculation was performed using the HPCC Platform of the Xian Jiaotong University. Shengwu Guo contributed to the materials characterization in this work.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

47. Optimal granule level selection: A granule description accuracy viewpoint

Accession number: 20194607676694
Authors: Wan, Qing (1, 2); Li, Jinhai (3, 4); Wei, Ling (2, 5); Qian, Ting (2, 6)
Author affiliation: (1) School of Science, Xi'an Polytechnic University, Shaanxi; 710048, China; (2) Institute of Concepts, Cognition and Intelligence, Northwest University, Shaanxi; 710069, China; (3) Data Science Research Center, Kunming University of Science and Technology, Yunnan; 650500, China; (4) Faculty of Science, Kunming University of Science and Technology, Yunnan; 650500, China; (5) School of Mathematics, Northwest University, Shaanxi; 710069, China; (6) School of Science, Xi'an Shiyou University, Shaanxi; 710065, China
Corresponding author: Li, Jinhai(jhlixjtu@163.com)
Source title: International Journal of Approximate Reasoning
Abbreviated source title: Int J Approximate Reasoning
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Pages: 85-105
Language: English
ISSN: 0888613X
CODEN: IJARE4
Document type: Journal article (JA)
Publisher: Elsevier Inc.
Abstract: Granule description has become one of the hot research topics in granular computing (GrC). Rough set theory (RST), as an important research technique for granular computing, can describe any target granule (any subset of a universe of discourse) by the lower and upper approximations. But, there is no measure to evaluate the quality of granule description in RST. Moreover, one can acquire different granule descriptions by decomposing a multi-scale information table into different single-scale information tables. Then, it is important to find the most appropriate single-scale information table for meeting specific granule description accuracy requirement. Inspired by the above problem, this paper is to discuss optimal granule level selection based on the granule description accuracy. First of all, a new granule description accuracy is defined by combining GrC and RST. After that, optimal granule level selection is investigated in a multi-scale information table subject to preserving granule description accuracies for a target granule and a group of target granules, respectively. Specially, for the case of a group of target granules, we put forward optimal granule level selection methods based on three different criteria, commonly used by people in daily life. In addition, considering that the data in real-life will be updated as time goes by, we discuss the impact on the optimal granule level when new objects are added gradually. Finally, the time complexity of the proposed algorithms is analyzed, the reasonability of setting the parameters is explained, some numerical experiments are conducted to show the effectiveness of our methods, and a comparison of our algorithms and the existing ones is made. © 2019 Elsevier Inc.
Number of references: 52
Main heading: Rough set theory
Controlled terms: Information granules - Numerical methods - Approximation algorithms - Granular computing - Granulation
Uncontrolled terms: Granule description - Hot research topics - Lower and upper approximations - Multi-scale informations - Numerical experiments - Optimal granule level - Rough set theory (RST) - Universe of discourse
Classification code: 723.2 Data Processing and Image Processing - 802.3 Chemical Operations - 921 Mathematics - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods
DOI: 10.1016/j.ijar.2019.11.001
Funding Details: Number: 11801440,11971211,61562050,61573173,61772021,61976130, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 19JK0380, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: The authors gratefully acknowledge the support of the National Natural Science Foundation of China (Nos. 11971211 , 61562050 , 61573173 , 61772021 , 61976130 and 11801440) and the Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 19JK0380).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

48. Hyperspectral-Based Estimation on the Chlorophyll Content of Turfgrass

Accession number: 20203509097370
Title of translation:
Authors: Ji, Tong (1, 2); Wang, Bo (1, 2); Yang, Jun-Yin (1, 2); Liu, Xiao-Ni (1, 2); Wang, Hong-Wei (3); Wang, Cai-Ling (4); Pan, Dong-Rong (5); Xu, Jun (6)
Author affiliation: (1) College of Pratacultural Science, Gansu Agricultural University, Lanzhou; 730070, China; (2) Key Laboratory of Grassland Ecosystem, Ministry of Education/Pratacultural Engineering Laboratory of Gansu Province, Lanzhou; 730070, China; (3) Engineering University of CAPF, Xi'an; 710086, China; (4) School of Computer Science, Xi'an Shiyou University, Xi'an; 710065, China; (5) Grassland Technique Extension Station of Gansu Province, Lanzhou; 730000, China; (6) Xi'an Institute of Aeronautics, Xi'an; 710077, China
Corresponding author: Liu, Xiao-Ni(liuxn@gsau.edu.cn)
Source title: Guang Pu Xue Yu Guang Pu Fen Xi/Spectroscopy and Spectral Analysis
Abbreviated source title: Guang Pu Xue Yu Guang Pu Fen Xi
Volume: 40
Issue: 8
Issue date: August 1, 2020
Publication year: 2020
Pages: 2571-2577

Language: Chinese
ISSN: 10000593
CODEN: GYGFED
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Lawn color is the most obvious indicator of ornamental lawn value. It is of great significance to explore the relationship between chlorophyll content of turfgrass and the hyperspectral reflectance. This relationship can be used to develop models to calculate the chlorophyll content for lawn quality evaluation purpose. In this study, three common lawn grass species-Festuca arundinacea CV. Hongxiang, Lolium perenne CV. Bailingniao and Poa pratensis CV. Kentucky was cultivated in pots. Measurements of chlorophyll content and hyperspectral reflectance were made during active growth period by tys-a3500 chlorophyll meter and SOC710VP imaging spectrometer to determine the relative chlorophyll content (SPAD) and spectral data of turf grass canopy, respectively. Person correlation analysis for each of the SPAD, 1/SPAD and log(1/SPAD) was conducted with a group of variables including vegetation index-10 G (green vegetation index), ARVI (atmospheric impedance difference vegetation index), VARI (visual pressure impedance index), NDVI705 normalized difference vegetation index (705), MSR705 red edge ratio vegetation index (improved), NDVI670 normalized difference vegetation index (670), CI (chlorophyll index), PSRI attenuation (vegetation index), RGI (relatively green index) and EVI (Enhance the correlation of vegetation index). After screening the hyperspectral bands of vegetation index with the highest correlation with chlorophyll content, models were developed using the vegetation index based on these bands. After the best model was selecting through an accuracy test, the model was used to estimate the chlorophyll SPAD values change for turf grasses under different concentrations of heavy metals Pb2+ stress. The results are summarized as follows: (1) the overall trends of spectral curves of different turfgrass were not significantly different, but the reflectance (REF) of different species were different. At the band of 730~1 000 nm, there was no significant difference between "lark" perennial ryegrass and "red elephant" tallfestia REF, but the spectral characteristics of "Kentucky bluegrass" were unique with a higher REF. (2) among the 10 vegetation indexes, VARI, RGI and PSRI were extremely significantly correlated with 3 chlorophyll indexes of turfgrass, and the absolute value of correlation coefficient R2 was all greater than 0.65, indicating that it is feasible to estimate the chlorophyll content of turfgrass with these 3 vegetation indexes. (3) Stepwise regression analysis of vegetation index and chlorophyll index shows that in the single-factor regression model, the model determination coefficient (R2) of estimating 1/SPAD using vegetation index VARI, RGI and PSRI was above 0.626, which was generally higher than the estimation of SPAD and log(1/SPAD). In multiple linear regression, the model determination coefficient (R2) constructed by 10 vegetation indexes and chlorophyll index 1/SPAD was also the highest (0.817), showing that SPAD reciprocal form is applicable to be used the in model estimation of chlorophyll in turfgrass. (4) The best model selected from the models with a high determination coefficient (>0.7) through accuracy test was y1/SPAD=0.161xRGI+0.007xGI-0.054 (R2=0.817, RMSE=0.023). © 2020, Peking University Press. All right reserved.
Number of references: 15
Main heading: Chlorophyll
Controlled terms: Hyperspectral imaging - Quality control - Spectroscopy - Vegetation - Heavy metals - Multiple linear regression - Reflection
Uncontrolled terms: Correlation coefficient - Determination coefficients - Hyperspectral reflectance - Multiple linear regressions - Normalized difference vegetation index - Ratio vegetation indices - Spectral characteristics - Stepwise regression analysis
Classification code: 531 Metallurgy and Metallography - 746 Imaging Techniques - 804.1 Organic Compounds - 913.3 Quality Assurance and Control - 922.2 Mathematical Statistics
Numerical data indexing: Size 7.30e-07m to 1.00e-06m
DOI: 10.3964/j.issn.1000-0593(2020)08-2571-07
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

49. Interface characterization and mechanical properties of Mo-added chromium carbide-nickel composite

Accession number: 20203509109379
Authors: Sun, Liang (1); Hui, Weihua (1); Xu, Liujie (2); Zhai, Wenyan (1); Dong, Hui (1); Wang, Yiran (3); He, Lin (3); Peng, Jianhong (4)
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Corresponding author: Zhai, Wenyan(180606@xsyu.edu.cn)
Source title: Ceramics International
Abbreviated source title: Ceram Int
Volume: 46
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Issue date: December 1, 2020
Publication year: 2020
Pages: 27071-27079
Language: English
ISSN: 02728842
CODEN: CINNDH
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: A novel chromium carbidenickel composite was in situ fabricated through pressureless sintering in a vacuum furnace using Cr, C, Ni and Mo mixed powders. In this study, the Mo content distribution on interface characterization including the effect of phase transformation mechanism and mechanical properties of the composite were researched thoroughly. The results indicated that a newly found and excellent semi-coherent boundary existed between Cr3C2 and Ni, which was (002)Cr3C2//(111(_))Ni, [12(_)0]Cr3C2//[011]Ni. Their disregistry along the particular orientation relationship was approximately 10.6%, indicating that Cr3C2 could serve as an efficient heterogeneous nucleation area of Ni. An interdiffusion and phase transformation occurred in the microstructure, Mo element tended to solid solute into the carbide matrix which changed from (Cr, Ni)3C2 to (Cr, Mo)3C2, and (Cr, Mo, Ni)7C3. Moreover, according to DFT calculation for contain phases as well as the Rockwell hardness, bending strength, and fracture roughness were enhanced simultaneously, it was attributed to grain refinement, solution strengthening, and better mechanical properties of the (Cr, Mo, Ni)7C3 phase. © 2020 Elsevier Ltd and Techna Group S.r.l.
Number of references: 21
Main heading: Nucleation
Controlled terms: Nickel compounds - Chromium alloys - Grain refinement - Sintering - Bending strength - Linear transformations - Nickel - Phase interfaces - Vacuum furnaces - Carbides - Chromium compounds
Uncontrolled terms: Coherent boundaries - Fracture roughness - Heterogeneous nucleation - Interface characterization - Orientation relationship - Phase transformation mechanisms - Pressure-less sintering - Solution strengthening
Classification code: 543.1 Chromium and Alloys - 548.1 Nickel - 801.4 Physical Chemistry - 804.2 Inorganic Compounds - 812.1 Ceramics - 921.3 Mathematical Transformations - 933.1.2 Crystal Growth
Numerical data indexing: Percentage 1.06e+01%
DOI: 10.1016/j.ceramint.2020.07.184
Funding Details: Number: 2020JQ-777,2019JQ-821, Acronym: -, Sponsor: -; Number: HKDNM2019018,HKDNM201811,20192110, Acronym: -, Sponsor: State Key Laboratory for Mechanical Behavior of Materials;
Funding text: This work was supported by the Open Fund of State Key Laboratory for Mechanical Behavior of Materials (20192110), the Open Fund of National Joint Engineering Research Center for abrasion control and molding of metal materials (HKDNM201811 and HKDNM2019018) and the Natural Science Basic Research Plan in Shaanxi Province of China (2019JQ-821 and 2020JQ-777).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

50. The inhibition property and mechanism of a novel low molecularweight zwitterionic copolymer for improving wellbore stability (*Open Access*)

Accession number: 20201508386514
Authors: Du, Weichao (1, 2); Slaný, Michal (3); Wang, Xiangyun (1); Chen, Gang (1); Zhang, Jie (1)
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Article number: 708
Language: English
E-ISSN: 20734360
Document type: Journal article (JA)
Publisher: MDPI AG
Abstract: In this work, a novel low molecular weight zwitterionic copolymer for improving wellbore stability, which is expected to be an alternative to the current shale inhibitors, was obtained by copolymerization of tris hydroxyethyl allyl ammonium bromide (THAAB), 2-acrylamido-2-methyl propane sulfonic acid (AMPS) and acrylamide (AM), initiated by a redox initiation system in an aqueous solution. The copolymer, denoted as SX-1, was characterized by FT-IR, TGA-DSC, and GPC. Results demonstrated that the molecular weight of SX-1 was approximately 13,683 g/mol and it displayed temperature resistance up to 225 °C. Regarding the inhibition performance, evaluation experiments showed the hot rolling recovery of a Longmaxi shale sample in 2.0 wt % SX-1 solutions was up to 90.31% after hot rolling for 16 h at 120 °C. The Linear swelling height of Na-MMT artificial core in 2.0 wt % SX-1 solution was just 4.74 mm after 16 h. Methods including particle size analysis, FTIR, XRD, and SEM were utilized to study the inhibition mechanism of SX-1; results demonstrated that SX-1 had entered into the inner layer of sodium montmorillonite (Na-MMT) and adsorbed on the inner surface, and the micro-structure of Na-MMT was successfully changed by SX-1. The particle size of Na-MMT in distilled water was 8.05 μm, and it was observed that its size had increased to 603 μm after the addition of 2.0 wt % of SX-1. Its superior properties make this novel low molecular weight copolymer promising for ensuring wellbore stability, particularly for high temperature wells. © 2020 by the authors. Licensee MDPI, Basel, Switzerland.
Number of references: 36
Main heading: Clay minerals
Controlled terms: Boreholes - Hot rolling - Particle size - Particle size analysis - Amides - Acrylic monomers - Drilling fluids - Nanocomposites - Oil field equipment
Uncontrolled terms: 2-acrylamido-2-methylpropanesulfonic acid - Low molecular weight - Polymer nanocomposite - Redox initiation systems - Shale hydration - Temperature resistances - Water based drilling fluids - Zwitterionic copolymers
Classification code: 482.2 Minerals - 511.2 Oil Field Equipment - 535.1.2 Rolling Mill Practice - 761 Nanotechnology - 804.1 Organic Compounds - 933 Solid State Physics - 951 Materials Science
Numerical data indexing: Molar_Mass 1.37e+04g/mol, Percentage 9.03e+01%, Size 4.74e-03m, Size 6.03e-04m, Size 8.05e-06m, Temperature 3.93e+02K, Temperature 4.98e+02K, Time 5.76e+04s
DOI: 10.3390/polym12030708
Funding Details: Number: 2/0141/17, Acronym: -, Sponsor: -; Number: -, Acronym: SWPU, Sponsor: Southwest Petroleum University; Number: APVV-15-0741,APVV-18-0075, Acronym: APVV, Sponsor: Agentúra na Podporu Výskumu a Vývoja; Number: PLN201814, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation;
Funding text: Funding: The authors would like to thank the Open Fund (PLC20190703) of the State Key Laboratory of Oiland Gas Reservoir Geology and Exploitation (Chengdu University of Technology) and the Open Fund (PLN201814) of the State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Southwest Petroleum University) for financial support. One of the authors (M. S.) acknowledgements financial support of this research by the Slovak Grant Agency VEGA (grant 2/0141/17) and the Slovak Research and Development Agency (grants APVV-15-0741 and APVV-18-0075).
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51. Development mechanism of local corrosion pit in X80 pipeline steel under flow conditions

Accession number: 20200508101317
Authors: Tan, Zhuowei (1); Zhang, Dalei (2); Yang, Liuyang (2); Wang, Zhenbo (1); Cheng, Frank (3); Zhang, Mingyang (4); Jin, Youhai (1); Zhu, Shidong (5)

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Language: English
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Publisher: Elsevier Ltd
Abstract: In this paper, local corrosion pits were stimulated by arc defect pits (ADP) of different sizes. The corrosion of specimens was tested in high-speed flow CO2-saturated NACE solution. Electrochemical corrosion characteristics were monitored online. The characteristics of corrosion scale were then investigated by SEM and Raman spectroscopy. The results showed deepening and expansion of corrosion pits will occur at the same time under flow conditions for shallow pits. The development of corrosion pits at certain depth led to formation of complete corrosion scale, which inhibited further corrosion. As corrosion pits deepened, expansion process decreased and deepening rates accelerated. In-depth analysis suggested that corrosion rates were mainly affected by mass transfer rate and integrity of formed corrosion scale. © 2020 Elsevier Ltd
Number of references: 54
Main heading: Electrochemical corrosion
Controlled terms: Corrosion inhibitors - Carbon dioxide - Shear flow - Expansion - Mass transfer - Pitting - Shear stress - Steel corrosion - Corrosion rate - Pipeline corrosion
Uncontrolled terms: CO2 corrosion - Development mechanisms - Expansion process - Flow condition - Local corrosion - Mass transfer rate - Wall shear stress - X80 pipeline steels
Classification code: 539.1 Metals Corrosion - 539.2.1 Protection Methods - 545.3 Steel - 631.1 Fluid Flow, General - 641.3 Mass Transfer - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 951 Materials Science
DOI: 10.1016/j.triboint.2019.106145
Funding Details: Number: ZR2018MEM002, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province; Number: 51774314, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 19CX05001A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

52. Characteristics and influencing factors of CO2 flooding in different microscopic pore structures in tight reservoirs

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Title of translation: CO2
Authors: Huang, Xing (1); Ni, Jun (2); Li, Xiang (3); Xue, Junjie (1); Bai, Mingxing (1, 4); Zhou, Tong (5)
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ISSN: 02532697
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Publisher: Science Press
Abstract: The microscopic pore structures of tight sandstone reservoirs have a significant impact on the CO2 flooding characteristics. Based on the experimental results from thin section analysis, SEM, high-pressure mercury injection and NMR testing, this paper establishes a classification standard for the microscopic pore structures of the Chang 8 oil-bearing formation in Jiyuan oilfield, carries out CO2 flooding experiment under different displacement pressures using the representative core samples of each type of reservoir, and in combination with NMR T2 spectroscopy, studies the displacement characteristics of crude oil in macro and small pores under various displacement pressures in reservoirs of 3 types of pore structures, and detailedly analyzes the effect of reservoir physical property, pore structure and clay minerals on CO2 flooding efficiency. The results show that the pore structure of Chang 8 reservoir in the study area can be divided into type I, and . The reservoir space and percolation ability corresponding to the three types of pore structures decrease successively. Type reservoir has the largest miscible CO2 flooding efficiency, and type reservoir has the largest immiscible CO2 flooding efficiency; the displacement characteristics of crude oil in pore throats with different pore sizes vary greatly with different displacement pressure and various types of reservoir pore structures. Immiscible CO2 flooding efficiency has a good correlation with rock permeability, pore throat radius, sorting coefficient and clay mineral content, while the level of miscible CO2 flooding efficiency is related to pore structure parameters and clay mineral content. As the main production potential tapping horizon in the future, type reservoir is more suitable for CO2 flooding. These achievements provide a method and basis for the reasonable and efficient CO2 flooding of Chang 8 reservoir in Jiyuan oilfield.
Number of references: 25
Main heading: Carbon dioxide
Controlled terms: Reservoirs (water) - Crude oil - Oil well flooding - Pore structure - Solvents - Oil bearing formations - Nuclear magnetic resonance - Pore size - Clay minerals - Efficiency - Sandstone - Floods - Petroleum reservoir engineering - Petroleum reservoirs
Uncontrolled terms: Classification standard - Different pore sizes - Displacement characteristic - Displacement pressure - High pressure mercury - Microscopic pore structures - Reservoir physical property - Tight sandstone reservoirs
Classification code: 441.2 Reservoirs - 482.2 Minerals - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.7623/syxb202007007
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

53. Cost-Effective Monolithic Hierarchical Carbon Cryogels with Nitrogen Doping and High-Performance Mechanical Properties for CO2 Capture

Accession number: 20202308781877
Authors: Li, Ze-Liang (1); Zhou, Ya-Lan (1); Yan, Wen (1); Luo, Lu (1); Su, Zhi-Zhong (1, 2); Fan, Mi-Zi (3); Wang, Shi-Rui (4); Zhao, Wei-Gang (1)
Author affiliation: (1) College of Material Engineering, Fujian Agriculture and Forestry University, No. 63 Xiyuangong Road, Fuzhou; 350002, China; (2) School of Resources and Chemical Technology, Sanming University, Sanming, Fujian; 365004, China; (3) College of Engineering, Design and Physical Sciences, Brunel University, Uxbridge; UB8 3PH, United Kingdom; (4) College of Material Science and Engineering, Xi'An Shiyou University, 18 Dianzier Road, Xi'an; 710065, China
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Publication year: 2020
Pages: 21748-21760
Language: English
ISSN: 19448244
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Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Cost-effective nitrogen-doped monolithic hierarchical carbon cryogels with excellent mechanical properties and carbon dioxide (CO2) adsorption performance were prepared from phenol, melamine, and formaldehyde (PMF) by the sol-gel, freeze-drying, and then, pyrolysis processes under an inert atmosphere. The morphology, mechanical properties, pore structure, and chemical characteristics of these cryogels were investigated. The results showed that the dilution ratio played a crucial role in the preparation of nitrogen-doped PMF carbon cryogels with controlled structures. The prepared carbon cryogels were a kind of monolithic materials composed of a hierarchical pore structure and had high compression properties (0.67 and 9.4 MPa for strength and modulus), porosity (97.6%), surface area (1406 m2/g), and heteroatom nitrogen content (0.98-2.09%). CO2 adsorption capacities up to 5.75 mmol/g at 0 °C and 4.50 mmol/g at 25 °C under 1 bar were obtained, which is at a high level among N-doped carbon materials and far better than resorcinol-based carbon gels reported. These superior CO2 adsorption capacities, high isosteric adsorption heat (Qst), and good CO2/N2 adsorption selectivity were ascribed to the synergistic effect of high surface area, appropriate pore size, and also heteroatom doping. Copyright © 2020 American Chemical Society.
Number of references: 67
Main heading: Carbon dioxide
Controlled terms: Doping (additives) - Physisorption - Morphology - Phenols - Pore structure - Formaldehyde - Pore size - Sol-gels - Cost effectiveness - Gas adsorption - Nitrogen
Uncontrolled terms: Adsorption performance - Adsorption selectivity - Chemical characteristic - Controlled structures - Hierarchical pore structures - Inert atmospheres - Monolithic material - Synergistic effect
Classification code: 802.3 Chemical Operations - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 911.2 Industrial Economics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Molality 4.50e+00mol/kg, Molality 5.75e+00mol/kg, Percentage 9.76e+01%, Percentage 9.80e-01% to 2.09e+00%, Pressure 1.00e+05Pa, Pressure 6.70e+05Pa, Pressure 9.40e+06Pa, Specific_Surface_Area 1.41e+06m2/kg, Temperature 2.73e+02K, Temperature 2.98e+02K
DOI: 10.1021/acsami.0c04015
Funding Details: Number: 31971593, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province; Number: -, Acronym: -, Sponsor: Department of Science and Technology, Government of Kerala; Number: 2019J01386, Acronym: -, Sponsor: Science and Technology Department of Tibet;
Funding text: The authors are grateful for the financial support from the National Natural Science Foundation of China (31971593) and the Natural Science Foundation of Fujian Province, Department of Science and Technology (2019J01386).
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Database: Compendex
Data Provider: Engineering Village

54. Radii-dependent self-assembly of chiral lanthanide complexes: synthesis, chirality, and single-molecule magnet behavior

Accession number: 20203309052692
Authors: Li, Ge (1); Zhao, Xiaoxi (1); Han, Qingxin (2); Wang, Li (3); Liu, Weisheng (1)
Author affiliation: (1) Key Laboratory of Nonferrous Metals Chemistry and Resources Utilization of Gansu Province, State Key Laboratory of Applied Organic Chemistry, College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou; 730000, China; (2) College of Bioresources Chemistry and Materials Engineering, Shaanxi University of Science and Technology, Xi'an; 710021, China; (3) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
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Pages: 10120-10126
Language: English
ISSN: 14779226
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CODEN: DTARAF
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A pair of 3-methoxysalicylhydrazone-based homochiral ligands constructed chiral trinuclear and pentanuclear complexes with LaIII and DyIII ions, respectively, which indicates that the radii controlled the self-assembled structures. Chiral transfer during the self-assembly processes was confirmed by crystal structure analysis and CD spectroscopy. Then, magnetic investigations demonstrated that the chiral Dy5 complexes exhibited typical single-molecule magnet behavior. © 2020 The Royal Society of Chemistry.
Number of references: 71
Main heading: Molecules
Controlled terms: Stereochemistry - Self assembly - Magnets - Synthesis (chemical) - Dysprosium compounds - Crystal structure
Uncontrolled terms: CD spectroscopy - Crystal structure analysis - Lanthanide complex - Pentanuclear complexes - Self assembled structures - Self assembly process - Single-molecule magnet - Trinuclear
Classification code: 801 Chemistry - 802.2 Chemical Reactions - 931.3 Atomic and Molecular Physics - 933.1.1 Crystal Lattice - 951 Materials Science
DOI: 10.1039/d0dt01711f
Funding Details: Number: 2020JQ-763, Acronym: -, Sponsor: -; Number: 21431002, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: lzujbky-2018-kb12, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work was supported by the National Natural Science Foundation of China (Grant: 21871122; 21431002), the Fundamental Research Funds for the Central Universities (Grant: lzujbky-2018-kb12) and the Natural Science Basic Research Program of Shanxi (Program No. 2020JQ-763).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

55. A visual experimental study on proppants transport in rough vertical fractures

Accession number: 20203409083131
Authors: Huang, Hai (1, 4); Babadagli, Tayfun (1, 2); Li, Huazhou (1, 2); Develi, Kayhan (3); Zhou, Desheng (1)
Author affiliation: (1) Xi'an Shiyou University and Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs, Xian; 710065, China; (2) School of Mining and Petroleum Engineering, Faculty of Engineering, University of Alberta, Edmonton; T6G 1H9, Canada; (3) Department of Geological Engineering, Istanbul Technical University, Maslak, Istanbul, Turkey; (4) Henan Tianxiang New Materials Co., LTD, Zhulin Town, Gongyi City; Henan Province; 451255, China
Corresponding author: Li, Huazhou(huazhou@ualberta.ca)
Source title: International Journal of Rock Mechanics and Mining Sciences
Abbreviated source title: Int. J. Rock Mech. Min. Sci.
Volume: 134
Issue date: October 2020
Publication year: 2020
Article number: 104446
Language: English
ISSN: 13651609
CODEN: IRMGBG
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The roughness of fractures may play an important role in affecting the migration and placement of proppants during hydraulic fracturing operations. A series of proppant flow experiments were conducted in attempt to compare the proppant transport mechanisms in rough fractures against those in smooth fractures. We examine the migration of proppants in rough and vertical fractures and then quantitatively reveal the effect of roughness on the instantaneous proppants transport and final proppants placement. The proppants-transport behavior in the rough and vertical fractures was observed to be totally different from that in the smooth and vertical fractures. The proppants in a rough

vertical fracture do not progress like the regular sand bank that commonly occurs in the smooth fracture, but rather as an irregular-shape sand cluster with fractal characteristics. In the rough and vertical fracture, the phenomenon of proppants bridging is visually observed. The roughness of the fracture model not only affects how much of the fracture area is being occupied by the proppants, but also affects how tightly the proppants fill up the fracture. © 2020 Elsevier Ltd
Number of references: 40
Main heading: Proppants
Controlled terms: Fracture
Uncontrolled terms: Flow experiments - Fracturing operations - Proppant transports - Rough fractures - Roughness effects - Sand banks - Transport behavior - Transport mechanism - Vertical fracture - Visualization study
Classification code: 511.1 Oil Field Production Operations - 951 Materials Science
DOI: 10.1016/j.ijrmms.2020.104446
Funding Details: Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: -, Acronym: UofA, Sponsor: University of Alberta; Number: 51874240,51874242, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 18752034, Acronym: TÜBİTAK, Sponsor: Türkiye Bilimsel ve Teknolojik Araştırma Kurumu; Number: NS PIN 05394,RES0011227, Acronym: -, Sponsor: Saudi Aramco; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2020KW-027, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: This research was conducted under T. Babadagli's NSERC Industrial Research Chair in Unconventional Oil Recovery (industrial partners are APEX Eng., Devon, Husky Energy, Petroleum Development Oman, Saudi Aramco, SIGNa Oilfield Canada, Total E&P Recherché Développement) and NSERC Discovery Grants (No: RES0011227 and NS PIN 05394) to T. Babadagli and H. Li, respectively. H. Huang is also grateful for the financial supports provided by the National Natural Science Foundation of China (No. 51874240 , No. 51874242), the Key Research and Development Plan of Shannxi Province (No. 2020KW-027), as well as the Xi'an Shiyou University for supporting his stay at the University of Alberta. Also, K. Develi is thankful to the Scientific and Technological Research Council of Turkey (TÜBTAK) for his postdoctoral scholarship at University of Alberta through the BIDEP program. We gratefully acknowledge these supports. The authors also thank Mr. Gongjue Wei for the assistance in analyzing the experimental data. This manuscript is a revised version of the conference papers SPE 187520 34 and SPE 189892. 35 More experimental data and analysis have been added into the conference version.This research was conducted under T. Babadagli's NSERC Industrial Research Chair in Unconventional Oil Recovery (industrial partners are APEX Eng. Devon, Husky Energy, Petroleum Development Oman, Saudi Aramco, SIGNa Oilfield Canada, Total E&P Recherch? D?veloppement) and NSERC Discovery Grants (No: RES0011227 and NSPIN 05394) to T. Babadagli and H. Li, respectively. H. Huang is also grateful for the financial supports provided by the National Natural Science Foundation of China (No. 51874240, No. 51874242), the Key Research and Development Plan of Shannxi Province (No. 2020KW-027), as well as the Xi'an Shiyou University for supporting his stay at the University of Alberta. Also, K. Develi is thankful to the Scientific and Technological Research Council of Turkey (T?B?TAK) for his postdoctoral scholarship at University of Alberta through the BIDEP program. We gratefully acknowledge these supports. The authors also thank Mr. Gongjue Wei for the assistance in analyzing the experimental data. This manuscript is a revised version of the conference papers SPE 18752034 and SPE 189892.35 More experimental data and analysis have been added into the conference version.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

56. First-principles calculations of electronic structure and optical and elastic properties of the novel ABX3-type LaWN3perovskite structure (*Open Access*)

Accession number: 20202008663652
Authors: Liu, Xing (1, 2); Fu, Jia (1); Chen, Guangming (3)
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Corresponding author: Fu, Jia(fujia@xsyu.edu.cn)
Source title: RSC Advances
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Publication year: 2020
Pages: 17317-17326
Language: English
E-ISSN: 20462069
CODEN: RSCACL
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: The development of ABX3-type advanced perovskite materials has become a focus for both scientific researchers and the material genome initiative (MGI). In addition to the traditional perovskite ABO3and halide perovskite ABX3, LaWN3is discovered as a new ABX3-type advanced perovskite structure. The elastic and optical properties of this novel LaWN3structure are systematically studiedviaDFT. Based on the calculated elastic constants, the bulk modulus, shear modulus, Young's modulus and Pugh modulus ratio are precisely obtained. Results show that (1) LaWN3is an indirect bandgap semiconductor with a hybrid occuring near the Fermi level and the main contributions are La-d, W-d and N-p. (2) LaWN3has a certain ductility. The optical constants, such as absorption spectrum, energy-loss spectrum, conductivity, dielectric function, reflectivity and refractive index, are analyzed and the static dielectric constant is 10.98 and the refractivity index is 3.31. (3) The optical constants of LaWN3are higher than those of other existing ABX3-type materials, showing very promising application as a functional perovskite in the future. The existence of this stable LaWN3structure might widen the perovskite material's application, such as in photodetectors, light-emitting diodes, perovskite solar cells, fuel cells and so on. © The Royal Society of Chemistry 2020.
Number of references: 71
Main heading: Perovskite
Controlled terms: Refractive index - Calculations - Dielectric materials - Electronic structure - Absorption spectroscopy - Elastic moduli - Energy dissipation - Fuel cells
Uncontrolled terms: Dielectric functions - Elastic properties - Energy-loss spectrum - First-principles calculation - Halide perovskites - Indirect bandgap semiconductors - Perovskite structures - Static dielectric constants
Classification code: 482.2 Minerals - 525.4 Energy Losses (industrial and residential) - 702.2 Fuel Cells - 708.1 Dielectric Materials - 741.1 Light/Optics - 921 Mathematics - 951 Materials Science
DOI: 10.1039/c9ra10735e
Funding Details: Number: 51905427, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020JQ-769, Acronym: -, Sponsor: Natural Science Foundation 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

57. Nitrogen-Doped Carbon-Assisted One-pot Tandem Reaction for Vinyl Chloride Production via Ethylene Oxychlorination (*Open Access*)

Accession number: 20204009264292
Authors: Ma, Hongfei (1); Ma, Guoyan (2, 3); Qi, Yanying (1); Wang, Yalan (1); Chen, Qingjun (1); Rout, Kumar R. (1, 4); Fuglerud, Terje (5); Chen, De (1)
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Source title: Angewandte Chemie - International Edition
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Publisher: Wiley-VCH Verlag
Abstract: A bifunctional catalyst comprising CuCl2/Al2O3 and nitrogen-doped carbon was developed for an efficient one-pot ethylene oxychlorination process to produce vinyl chloride monomer (VCM) up to 76 % yield at 250 °C and under ambient pressure, which is higher than the conventional industrial two-step process ($_{(\approx 50}$ %) in a single pass. In the second bed, active sites containing N-functional groups on the metal-free N-doped carbon catalyzed both ethylene oxychlorination and ethylene dichloride (EDC) dehydrochlorination under the mild conditions. Benefitting from the bifunctionality of the N-doped carbon, VCM formation was intensified by the surface Cl*-looping of EDC dehydrochlorination and ethylene oxychlorination. Both reactions were enhanced by in situ consumption of surface Cl* by oxychlorination, in which Cl* was generated by EDC dehydrochlorination. This work offers a promising alternative pathway to VCM production via ethylene oxychlorination at mild conditions through a single pass reactor. © 2020 The Authors. Published by Wiley-VCH GmbH
Number of references: 48
Main heading: Ethylene
Controlled terms: Doping (additives) - Nitrogen - Chlorine compounds - Copper compounds
Uncontrolled terms: Ambient pressures - Bi-functional catalysts - Dehydrochlorination - Ethylene dichloride - Nitrogen-doped carbons - Single pass reactor - Two-step process - Vinyl chloride monomers
Classification code: 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Percentage 7.60e+01%, Temperature 5.23e+02K
DOI: 10.1002/anie.202006729
Funding Details: Number: YJSYZX20SKF0002, Acronym: -, Sponsor: -; Number: 237922, Acronym: -, Sponsor: Norges Forskningsråd;
Funding text: This work was supported by the iCSI (industrial Catalysis Science and Innovation) center, which receives financial support from the Research Council of Norway under the grant No. 237922. G. Ma acknowledges funding from the Open Foundation of Shaanxi Key Laboratory of Carbon Dioxide Sequestration and Enhanced Oil Recovery (under planning) with contract No. YJSYZX20SKF0002.
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Database: Compendex
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58. Laboratory investigation of the relationship between static rock elastic parameters and low field nuclear magnetic resonance data

Accession number: 20200508103629
Authors: Ge, Xinmin (1, 2, 3); Xiao, Yufeng (4); Fan, Yiren (1, 3); Liu, Jianyu (1); Zhang, Yonghao (5)
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Source title: International Journal of Rock Mechanics and Mining Sciences
Abbreviated source title: Int. J. Rock Mech. Min. Sci.
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Article number: 104207
Language: English
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Publisher: Elsevier Ltd
Abstract: The static rock elastic parameters are important in the petrophysical evaluation of unconventional reservoirs since many of them need the fracturing technology for development. However, it often fails to establish models of the static rock elastic parameters through geophysical well logging data. We developed a preliminary research to

explore the relationship between the static elastic parameters and the low field Nuclear Magnetic Resonance (NMR) parameters based on joint measurements of the NMR responses and rock mechanical properties. The geometric mean, the arithmetic mean of the transversal relaxation time, the cutoff value, as well as the bin porosities are considered to investigate their relationships with the static rock elastic parameters. The result revealed that the static Young's modulus is strongly correlated with the NMR parameters, whereas the static Poisson's ratio is slightly influenced by the pore size properties. This study provides a new perspective in the application of the low field NMR data. © 2020 Elsevier Ltd
Number of references: 27
Main heading: Relaxation time
Controlled terms: Elastic moduli - Elasticity - Nuclear magnetic resonance - Parameter estimation - Pore size - Rocks
Uncontrolled terms: Bin porosity - Elastic parameters - Laboratory investigations - Low field - Low field nuclear magnetic resonance - Nuclear magnetic resonance data - Resonance parameters - Static elastic parameter - Transversal relaxation time - Transversal relaxations
Classification code: 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.ijrmms.2019.104207
Funding Details: Number: 2017ZX05039-002,2017ZX05072-002, Acronym: -, Sponsor: -; Number: KLMMR-2018-B-03, Acronym: MLR, Sponsor: Ministry of Land and Resources of the People's Republic of China; Number: MMRZZ201805, Acronym: QNLM, Sponsor: Qingdao National Laboratory for Marine Science and Technology; Number: SXCU-201904, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 18CX06025A,19CX02006A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work was supported by the Open Fund of Shanxi cooperative innovation center of unconventional oil and gas exploration and development (Xi'an Shiyou University) (SXCU-201904), Fundamental Research Funds for the Central Universities (18CX06025A , 19CX02006A), the Laboratory for Marine Mineral Resources, Qingdao National Laboratory for Marine Science and Technology (MMRZZ201805), Key Laboratory of Marine Mineral Resources, Ministry of Land and Resources (KLMMR-2018-B-03), National Research Council of Science and Technology Major Project (2017ZX05039-002) and (2017ZX05072-002).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

59. Empirical methods of decline-curve analysis for shale gas reservoirs: Review, evaluation, and application

Accession number: 20203509115764
Authors: Liang, Hong-Bin (1); Zhang, Lie-Hui (1); Zhao, Yu-Long (1); Zhang, Bo-Ning (2); Chang, Cheng (3); Chen, Man (4); Bai, Ming-Xing (1, 5)
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Source title: Journal of Natural Gas Science and Engineering
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Article number: 103531
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Shale gas reservoirs are accessed using horizontal wells with fracturing technology. To improve production, the bottom-hole pressure is usually controlled. However, predicting the estimated ultimate recovery of the well becomes difficult with this production mode because the decline curves have a long tail and the production data changes dramatically. Comparing six decline-curve analysis methods shows that the empirical method is easiest.

Therefore, 24 empirical models are summarized, and 18 basic models are further analyzed by using actual production data. The results show that most empirical models are based on exponential or power functions, especially using the exponential function widely in recent years. Forecasting production in these models does not always appear as a monotonic decline with the influence of model structures. Some models can transform into others under certain conditions. The dimensions of some models are not uniform because the units of their time exponents are always neglected. Empirical models are influenced by data, and none of the models can be applied in every case because of varying data. The number of reliable models increases with an increase in the amount of data and a decrease in fluctuation. The relationship between empirical models and data characteristics rather than flow regimes should be noticed. General methods of noise reduction are not effective with the drastic fluctuations of shale gas wells, so improving production data preprocessing is important. Although model recommendations are given in this paper, a detailed selection principle should be further studied based on more data from different shale gas reservoirs. © 2020 Elsevier B.V.
Number of references: 77
Main heading: Exponential functions
Controlled terms: Gases - Shale gas - Horizontal wells - Natural gas well production - Bottom hole pressure - Petroleum reservoirs
Uncontrolled terms: Data characteristics - Decline curve analysis - Empirical method - Estimated ultimate recoveries - Production data - Production modes - Selection principles - Shale gas reservoirs
Classification code: 512 Petroleum and Related Deposits - 512.1.1 Oil Fields - 512.2 Natural Gas Deposits - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 921 Mathematics
DOI: 10.1016/j.jngse.2020.103531
Funding Details: Number: 2016ZX05062, Acronym: -, Sponsor: -; Number: 2019YFH0169, Acronym: -, Sponsor: International S and T Cooperation Program of Sichuan Province; Number: 51534006,51704247,51874251, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: SWPU, Sponsor: Southwest Petroleum University; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: -, Acronym: -, Sponsor: Overseas Expertise Introduction Project for Discipline Innovation; Number: PLN201909, Acronym: -, Sponsor: Overseas Expertise Introduction Center for Discipline Innovation of Food Nutrition and Human Health (111 Center);
Funding text: This work was supported by National Natural Science Foundation of China (Key Program) (Grant No. 51534006), National Natural Science Foundation of China (Grant No. 51874251 and 51704247), International S&T Cooperation Program of Sichuan Province (Grant No. 2019YFH0169), National High Technology Research & Development Program of China (Grant No. 2016ZX05062), the Deep Marine shale gas efficient development Overseas Expertise Introduction Center for Discipline Innovation (111 Center), and Open Fund (PLN201909) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Southwest Petroleum University). The authors would also like to appreciate the editors and reviewers, whose critical comments were very helpful in preparing this article.This work was supported by National Natural Science Foundation of China (Key Program) (Grant No. 51534006), National Natural Science Foundation of China (Grant No.51874251 and 51704247), International S&T Cooperation Program of Sichuan Province (Grant No. 2019YFH0169), National High Technology Research & Development Program of China (Grant No. 2016ZX05062), the Deep Marine shale gas efficient development Overseas Expertise Introduction Center for Discipline Innovation (111 Center), and Open Fund (PLN201909) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Southwest Petroleum University). The authors would also like to appreciate the editors and reviewers, whose critical comments were very helpful in preparing this article.
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Database: Compendex
Data Provider: Engineering Village

60. Preferential growth of directionally solidified Al2O3/SmAlO3 eutectic ceramics

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Authors: Wang, Xu (1, 3); Xiang, Wangshuai (1); Zhong, Yujie (2); Wan, Lei (3); Yan, Fuxue (1); Xian, Quangang (4); Jiang, Bailing (1); Wang, Jingyang (4)
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CODEN: SCMAF7
Document type: Journal article (JA)
Publisher: Acta Materialia Inc
Abstract: Directionally solidified Al2O3/SmAlO3 (SAP) eutectic ceramics were successfully prepared with an optical floating zone furnace. The crystallographic orientation and interfacial structures were investigated by electron backscattered diffraction and transmission electron microscopy. It was found that Al2O3 has one preferred growth direction but the SAP has two. The preferred growth direction of the directionally solidified Al2O3/SAP eutectic ceramics was #101¯0#Al2O3 || #100#SAP ||$_{\langle 011\rangle}$ SAP. The near-coincidence site lattice models were proposed to interpret the intergrowth of the two SAPs. It was found that the two interfaces have nearly the same volume strain, validating the coexistence of both orientation relationships. © 2020
Number of references: 19
Main heading: High resolution transmission electron microscopy
Controlled terms: Alumina - Solidification - Aluminum oxide - Eutectics
Uncontrolled terms: Coincidence site lattice models - Crystallographic orientations - Directionally solidified - Electron back-scattered diffraction - Interfacial structures - Optical floating zones - Orientation relationship - Preferential growth
Classification code: 531.2 Metallography - 741.3 Optical Devices and Systems - 802.3 Chemical Operations - 804.2 Inorganic Compounds
DOI: 10.1016/j.scriptamat.2020.06.069
Funding Details: Number: 6140923040203, Acronym: -, Sponsor: -; Number: 2019–067, Acronym: -, Sponsor: Joint Research Fund for Overseas Chinese Scholars and Scholars in Hong Kong and Macao; Number: 51804252, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Database: Compendex
Data Provider: Engineering Village

61. 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

Accession number: 20200308051817
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)
Author affiliation: (1) School of Energy Resource, China University of Geosciences (Beijing), Beijing; 100083, China; (2) Key Laboratory of Strategy Evaluation for Shale Gas, Ministry of Land and Resources, Beijing; 100083, China; (3) State Key Laboratory of Shale Oil and Gas Enrichment Mechanisms and Effective Development, Beijing; 100083, China; (4) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (5) Key Laboratory of Tectonics and Petroleum Resources (China University of Geosciences), Ministry of Education, Wuhan; 430074, China
Corresponding author: Tang, Xuan(tangxuan@cugb.edu.cn)
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Abbreviated source title: Int. J. Coal Geol.
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Language: English
ISSN: 01665162
CODEN: IJCGDE
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Publisher: Elsevier B.V.

Abstract: To investigate differences in gas origin and diffusion among various lithologies in the continent–marine transitional strata of the Lower Permian Shanxi Formation (P1s) and Upper Carboniferous Benxi Formation (C2b) in the southeastern margin of Ordos Basin, 31 natural gas samples were collected from the existing lithologies (including mudstone, sandstone, and coal) and their gas components and carbon and hydrogen isotope compositions were measured. Remarkable differences in the ethane (#13C2) and carbon dioxide isotope values (#13CCO2) within natural gas were found between the Shanxi and Benxi Formations: the #13C2 value of natural gas in the Shanxi Formation is generally less than -30‰, whereas that of the Benxi Formation is generally greater than -28‰; and CO2 in the Shanxi Formation is mainly of organic origin while that in the Benxi Formation is mainly inorganic. The unusually depleted #13C2 values found in the Shanxi Formation were caused by the addition of oil-type gas generated from the carbonate rock in the Taiyuan Formation, which resulted in partial reversal of the carbon isotope values (#13C1 > #13C2). However, this incorporation of oil-type gas did not occur in the Benxi Formation, which is most likely caused by the tight mudstone at the bottom of Taiyuan Formation. The differences between the Shanxi and Benxi Formations reveal that the gases in the two Formations belong to two separate gas systems, and this could be attributed to the tight mudstone and limestone existing between the reservoirs, which acts as an effective barrier preventing diffusion of gases. © 2019 Elsevier B.V.
Number of references: 99
Main heading: Natural gas
Controlled terms: Gases - Lime - Isotopes - Diffusion - Metamorphic rocks - Carbon dioxide
Uncontrolled terms: Carbon and hydrogens - Carbon isotopes - Isotope values - Lithologic reservoirs - Ordos Basin - Organic origin - Taiyuan formation - Transitional facies
Classification code: 522 Gas Fuels - 804.2 Inorganic Compounds
DOI: 10.1016/j.coal.2019.103380
Funding Details: Number: 41730421,41972132, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: TPR-2019-01, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: 2016ZX05034,2017ZX05009-002, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: 2019JQ-367, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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62. Determination of the effect of resin-coating on ceramic proppant settlement for optimal hydraulic fracturing applications

Accession number: 20202608879453
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Publisher: Elsevier B.V., Netherlands
Abstract: Resin-coated ceramic particles are a new type of proppants being tested in hydraulic fracturing operations, and this study investigates the drag coefficients of resin-coated ceramic particles in water. Eight resin-coated ceramic particles with diameters between 450 and 924 μm are selected in the tests. Using the high-resolution images obtained from a computer tomography (CT) scan, we measure the bulk volume, mean diameter, and volumetric fractions of three constituents making up each particle (resin coating, ceramic body, and air pockets). Compared to other methods, CT scan method leads to the minimum discrepancy between the estimated densities and the ideal particle densities. We measure the settling velocity of resin-coated ceramic particles in water in order to determine the drag coefficients, finding that the Roos and Willmarth's correlation (1971) is more appropriate for calculating the drag coefficients of resin-coated ceramic particles than the other four correlations. © 2020
Number of references: 33
Main heading: Drag coefficient
Controlled terms: Coatings - Resins - Computerized tomography - Proppants - Fracture
Uncontrolled terms: Ceramic bodies - Ceramic particle - Fracturing operations - High resolution image - Mean diameter - Particle densities - Settling velocity - Volumetric fractions
Classification code: 511.1 Oil Field Production Operations - 723.5 Computer Applications - 813.2 Coating Materials - 815.1.1 Organic Polymers - 951 Materials Science
Numerical data indexing: Size 4.50e-04m to 9.24e-04m
DOI: 10.1016/j.powtec.2020.06.039
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

63. Hierarchy structure and fracture mechanisms of the wild wolf tusk's enamel

Accession number: 20194107518124
Authors: Zhang, Nan (1, 2); Wang, Xu (1, 2); Xiang, Wangshuai (1); Zhong, Yujie (3, 4); Yan, Fuxue (1); Jiang, Bailing (1)
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Abstract: The self-growth and self-strengthening of natural biomaterials provided us strategies for new materials design. In this paper, the microstructure and fracture mechanisms of the wild wolf tusk's enamel were studied. The enamel included four-order hierarchies, which were the hydroxyapatite (HAP) fiber (first-order, nano-scale, ploy-crystals), enamel rod (second-order, micro-scale, rope-like), enamel type (third-order, meso-scale, mat-like) and the enamel patterns (forth-order, macro-scale), respectively. It was interesting to find that the numerous nano-grains distributed disorderly in a single HAP fiber. The thousands HAP fibers bundled together to form the rope-like enamel rod. The protein ligaments were discovered between adjacent enamel rods. The out enamel, inner enamel and P&D-zones showed a criss-cross type and ran through whole enamel pattern in three-dimensional space. The enamel of the wild wolf tusk exhibited an excellent fracture toughness based on the nanoindentation tests. The fracture morphology

in transverse direction indicated that the cracks preferred to propagate along the weak interface (protein or interrod) and cut those enamel rods perpendicular to the propagation direction. However, the cracks extended obviously forward along the step-like paths from the outmost surface of the enamel to the enamel-dentin junction in the longitudinal direction. It was considered that the protein ligament was the main reason for the good fracture toughness of the bulk enamel. Our studies reveal that the design strategies of the natural material can be applied to guide the development of high-performance artificial materials. © 2019
Number of references: 29
Main heading: Fracture toughness
Controlled terms: Biomaterials - Enamels - Morphology - Rope - Hydroxyapatite - Proteins - Cracks - Nanotechnology
Uncontrolled terms: Fracture morphology - Hierarchy structure - Hydroxyapatite (HAp) - Longitudinal direction - Nanoindentation tests - Natural biomaterials - Propagation direction - Three dimensional space
Classification code: 462.5 Biomaterials (including synthetics) - 761 Nanotechnology - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 813.2 Coating Materials - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.msec.2019.110277
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

64. Anticorrosive epoxy nanocomposite coatings filled with polyaniline-functionalized silicon nitride particles

Accession number: 20204509449763
Authors: Wang, Hongfen (1); Qi, Qi (1); Zhang, Yongxing (1); Chen, Shougang (1); Dong, Binbin (4); Zhu, Shidong (2); Hu, Qian (3); Guo, Zhanhu (3)
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Publisher: American Chemical Society
Abstract: Epoxy resin (ER) composite coatings on carbon steel were prepared with polyaniline (PANI)-functionalized silicon nitride (Si3N4) powders (PANI/Si3N4) as fillers. First, a 5% mass ratio of Si3N4fillers for ER coatings was selected to achieve a better physical and anticorrosion performance of Si3N4/ER coatings than that of ER coatings. Then, to attain PANI/Si3N4/ER coatings, PANI coated Si3N4fillers were prepared and added into the ER matrix at 5% mass ratio. The adhesion strength was further improved, and the water absorption rate was decreased for PANI/ Si3N4/ER coatings compared to Si3N4/ER coatings. In electrochemical impedance spectroscopy tests, the resistance values of the PANI/Si3N4/ER coatings were all higher than those of Si3N4/ER coatings and ER coatings. All results revealed the excellent barrier effects of PANI-functionalized Si3N4fillers and the significant roles of PANI in the prevention of coating elimination caused by interface defect sites. Finally, an anticorrosion mechanism of PANI/ Si3N4/ ER coatings was proposed.
Number of references: 70
Main heading: Epoxy resins
Controlled terms: Composite coatings - Electrochemical impedance spectroscopy - Corrosion resistant coatings - Polyaniline - Electrochemical corrosion - Silicon nitride - Water absorption - Silicon alloys
Uncontrolled terms: Anticorrosion mechanism - Anticorrosion performance - Epoxy nanocomposites - Interface defects - Nitride particles - Polyanilines (PAni) - Resistance values - Water absorption rates
Classification code: 539.1 Metals Corrosion - 539.2 Corrosion Protection - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 708.2 Conducting Materials - 801 Chemistry - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 813.2 Coating Materials - 815.1.1 Organic Polymers
Numerical data indexing: Percentage 5.00e+00%
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65. MEMS-based dual temperature control measurement method for thermoelectric properties of individual nanowires

Accession number: 20204209344399
Authors: Cui, Yan (1); Yang, Yang (2); Liu, Shuai (3); Dai, Sheng (1); Li, Tie (2); Wang, Yuelin (2)
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Document type: Journal article (JA)
Publisher: Cambridge University Press
Abstract: The development of thermoelectric measurement technology at nanoscale is a challenging task. Here, a novel MEMS-based dual temperature control (DTC) measurement method for thermoelectric properties of individual nanowires was proposed. Different from conventional thermal bridge testing devices, this DTC thermoelectric testing

device can obtain the thermoelectric properties by independently control ambient temperature and temperature difference between two ends of the nanowires through two separate resistance thermometers without auxiliary heating devices. The reliability of the model and the testing accuracy were verified by accurately measuring the thermal conductivity, electrical conductivity, and the absolute value of the Seebeck coefficient of VO2 nanowires.
Number of references: 22
Main heading: Nanowires
Controlled terms: Thermoelectric equipment - Thermoelectricity - Thermometers - Thermal conductivity - MEMS - Temperature control - Vanadium dioxide
Uncontrolled terms: Auxiliary heating - Control measurements - Electrical conductivity - Measurement methods - Resistance thermometers - Temperature differences - Thermoelectric measurements - Thermoelectric properties
Classification code: 615.4 Thermoelectric Energy - 641.1 Thermodynamics - 701.1 Electricity: Basic Concepts and Phenomena - 704.2 Electric Equipment - 731.3 Specific Variables Control - 761 Nanotechnology - 804.2 Inorganic Compounds - 933 Solid State Physics - 944.5 Temperature Measuring Instruments
DOI: 10.1557/mrc.2020.66
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

66. Merocyanine-based turn-on fluorescent probe for the sensitive and selective determination of thiophenols via a pKa shift mechanism

Accession number: 20201508391543
Authors: Zhang, Shengrui (1, 2); Wang, Qin (1, 2); Wu, Fangfang (1); Yang, Jiajun (3); Cheng, Tianyi (1); Yang, Xiao-Feng (1); Li, Zheng (3); Li, Hua (4)
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Corresponding author: Yang, Xiao-Feng(xfyang@nwu.edu.cn)
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Article number: 120965
Language: English
ISSN: 00399140
CODEN: TLNTA2
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The development of fluorescent probes for the sensitive and selective determination of highly toxic thiophenols is considerably important in the fields of biological and environmental sciences. Herein, a turn-on fluorescent probe for thiophenol, named MCSH, was constructed based on a pKa shift mechanism, employing merocyanine dye as the fluorophore and 2,-4-dinitrobenzenesulfonamide (DNBS) group as the recognition unit. The imine nitrogen of MCSH has a pKa value of 4.12, which renders its non-fluorescent Schiff base form exclusively under neutral conditions. However, after reacting with thiophenols, its DNBS group was removed to afford a merocyanine dye as the final product, whose pKa value upshifts to 8.11, and was present mainly as the fluorescent protonated Schiff base form under neutral media. Such drastic change in pKa values leads to a significant fluorescence enhancement and can be utilized for the detection of thiophenols. The fluorescence intensity at 627 nm increases linearly with thiophenol concentration in the range of 0.2–3 μM with a detection limit of 15 nM (S/N = 3). MCSH displays high selectivity for the detection of thiophenols over a wide range of other analytes, including aliphatic thiols. Furthermore,

the preliminary applications of MCSH for monitoring thiophenols in living cells and environmental have been carried out. © 2020 Elsevier B.V.
Number of references: 40
Main heading: Fluorescence spectroscopy
Controlled terms: Probes - Fluorescence
Uncontrolled terms: Fluorescence enhancement - Fluorescence intensities - Fluorescent probes - Merocyanine - pKa shift - Protonated schiff base - Selective determination - Thiophenols
Classification code: 741.1 Light/Optics - 741.3 Optical Devices and Systems - 941.3 Optical Instruments - 941.4 Optical Variables Measurements
Numerical data indexing: Size 6.27e-07m
DOI: 10.1016/j.talanta.2020.120965
Funding Details: Number: 19JK0192, Acronym: -, Sponsor: -; Number: 21475105,21675123,21807068, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 338050067: 2018–007, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: 2018JM2001, Acronym: -, Sponsor: Guizhou Science and Technology Department;
Funding text: This research was supported by the Natural Science Foundation of China (Nos. 21475105 , 21675123 , 21807068), the Science and Technology Department (No. 2018JM2001) of Shaanxi Province of China, the Educational Scientific Research Project of Shaanxi Province of China (19JK0192) and the Open Foundation of Key Laboratory of Synthetic and Natural Functional Molecule Chemistry of Ministry of Education (338050067: 2018–007).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

67. Characterisation, physicochemical and functional properties of protein isolates from Amygdalus pedunculata Pall seeds

Accession number: 20195007829166
Authors: Li, Cong (1); Yang, Juzhuan (1); Yao, Lu (1); Qin, Fangling (1, 2); Hou, Guofeng (1); Chen, Bang (1); Jin, Lihua (1); Deng, Jianjun (3); Shen, Yehua (1)
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CODEN: FOCHDJ
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Amygdalus pedunculata Pall is a kind of desert woody oil plant, and its seeds are high in protein. The protein of Amygdalus pedunculata Pall (API) was identified by SDS-PAGE, 2-DE and MS. More than 300 proteins were identified. The improved solubility, emulsifying properties and foaming properties of API were observed in a pH range of 2.0–12.0 and a sodium chloride concentration of 0–1.0 M. The results showed that API had a good solubility (94.2%), bulk density (0.107 g/mL), oil absorption capacity (3.54 g/g), thermal stability (91.58 °C), emulsifying property (70 m2/g) and foaming property (83.7%). The conformation changes of API were studied by fluorescence and differential scanning calorimetry (DSC). The degree of denaturation of denaturants for API was guanidine hydrochloride > urea > SDS. These results showed that API has good processing performance and can be used as a new type of plant protein resource. © 2019 Elsevier Ltd
Number of references: 38
Main heading: Proteins

Controlled terms: Urea - Solubility - Differential scanning calorimetry - Seed - Physicochemical properties - Emulsification - Sodium chloride
Uncontrolled terms: Amygdalus pedunculata Pall - Chloride concentrations - Conformation change - Emulsifying property - Functional properties - Guanidine hydrochloride - Oil absorption capacity - Processing performance
Classification code: 801.4 Physical Chemistry - 802.3 Chemical Operations - 804.1 Organic Compounds - 821.4 Agricultural Products - 944.6 Temperature Measurements
Numerical data indexing: Mass_Density 1.07e+02kg/m3, Percentage 8.37e+01%, Percentage 9.42e+01%, Specific_Surface_Area 7.00e+04m2/kg, Temperature 3.65e+02K
DOI: 10.1016/j.foodchem.2019.125888
Funding Details: Number: 21606181,21675125, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018ZDXM-NY-087,2019TSLNY03-02, Acronym: -, Sponsor: Key Technologies Research and Development Program;
Funding text: We are very grateful for the financial support from the National Natural Science Foundation of China (No. 21606181 and 21675125), Shaanxi Key Research and Development Program (No. 2018ZDXM-NY-087 and 2019TSLNY03-02), the Amygdalus pedunculata Engineering Technology Research Center of the State Forestry Administration and Key Laboratory of Yulin Desert Plant Resources. Cong Li, Juzhuan Yang and Yehua Shen designed the experiment. Juzhuan Yang and Bang Chen searched for relevant literature. Cong Li, Juzhuan Yang and Guofeng Hou performed the experiments. Fangling Qin and Lihua Jin assisted in the extraction of experimental data. Cong Li, Juzhuan Yang and Lu Yao analysed the experimental data and wrote the manuscript. Cong Li, Yehua Shen and Jianjun Deng guided the manuscript preparation.We are very grateful for the financial support from the National Natural Science Foundation of China (No. 21606181 and 21675125), Shaanxi Key Research and Development Program (No. 2018ZDXM-NY-087 and 2019TSLNY03-02), the Amygdalus pedunculata Engineering Technology Research Center of the State Forestry Administration and Key Laboratory of Yulin Desert Plant Resources.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

68. Propagation simulation and structural characterization of multiple hydraulic fractures in naturally fractured unconventional hydrocarbon reservoirs

Accession number: 20203809185411
Authors: Ren, Long (1, 2); Zhan, Shiyuan (3, 4); Zhou, Desheng (1, 2); Su, Yuliang (3); Wang, Wendong (3); Chen, Mingqiang (1, 2); Jing, Cheng (1, 2); Sun, Jian (1, 5)
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Article number: 103557
Language: English
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Publisher: Elsevier B.V., Netherlands
Abstract: Multiple hydraulic fractures in naturally fractured unconventional hydrocarbon reservoirs often induce complex fracture network growth, as revealed by microseismic monitoring data from Maxwell et al. (2002), Fisher et al. (2005) and Daniels et al. (2007). History matching and production forecasting from an unconventional hydrocarbon reservoir are possible only if a complex fracture network can be clearly described through the engineering parameters. However, the current integrated technology of propagation simulation and structural characterization of a complex fracture network still presents extreme challenges. A new propagation modeling and characterization technique has been developed for complex fracture network expansion that combines the improved displacement discontinuity method (DDM) and pseudo-3D fracture propagation model to simulate the propagation process of complex fracture networks and increase stimulation accuracy. These improvements are very important for modeling and simulation of

multifracture propagation in an unconventional hydrocarbon reservoir with natural fractures. The theoretical model includes the calculation model of the combined stress field, the mechanical model of fracture propagation patterns and corresponding propagation criteria, the injection fluid distribution model, and the mathematical model for structural description and morphological characterization as a postprocessing program. The propagation simulation results for a complex fracture network are implicitly and directly entered into the postprocessing program and further characterized by some engineering parameters. Simulation results show that different fracture network propagation patterns are produced, which are governed by the in situ stress anisotropy, hydraulic fracture density, and distribution modes of pre-existing natural fractures as well as the fracture interaction angle. More importantly, the simulation results can be characterized by different engineering parameters. The presented comprehensive workflow could assist reservoir engineers in clearly understanding and evaluating complex fracture networks, including the geometric morphology, spatial distribution and conductivity of complex fracture networks. This technique can help identify stimulation and forecasting strategies that will significantly improve well performance and ultimate recovery from unconventional hydrocarbon reservoirs. © 2020 Elsevier B.V.
Number of references: 66
Main heading: Fracture
Controlled terms: Morphology - Stresses - Complex networks - Mathematical morphology - Hydraulic fracturing - Hydrocarbons - Microseismic monitoring
Uncontrolled terms: Characterization techniques - Displacement discontinuity method - Integrated technologies - Morphological characterization - Propagation simulation - Structural characterization - Structural descriptions - Unconventional hydrocarbons
Classification code: 484.1 Earthquake Measurements and Analysis - 512.1.2 Petroleum Deposits : Development Operations - 722 Computer Systems and Equipment - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.jngse.2020.103557
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Funding text: This research was supported by the National Natural Science Foundation of China (No. 51704235 , 51874242 , 51934005 , 51974253 , 51804256), Natural Science Basic Research Plan in Shaanxi Province of China (No. 2019JQ-820 , 2019JQ-287 , 2019JQ-403) and Young Talent fund of University Association for Science and Technology in Shaanxi , China (No. 20180417).
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Data Provider: Engineering Village

69. Photocatalytic CO2conversion: What can we learn from conventional CO: Xhydrogenation?

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Source title: Chemical Society Reviews
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Language: English
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CODEN: CSRVBR
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Solar-driven reduction of CO2 into fuels/feedstocks is a promising strategy for addressing energy and CO2 emission issues. Despite great research efforts, it still remains a grand challenge to achieve efficient and highly

selective reduction of CO2 owing to the large bond energy of CO2 and the diversity of reduction products. In addition to the control of light harvesting and charge transfer like photocatalytic water splitting, the design of catalytically active sites is highly important to promote CO2 reduction activity and selectivity (e.g., C-C coupling). In fact, we can learn a lot from conventional CO2 hydrogenation and syngas conversion in terms of active site design. In this article, we demonstrate how to design catalytically active sites for efficient and highly selective photocatalytic reduction of CO2 by sorting out the rules from the existing research on conventional COx hydrogenation, with a focus on enhancing CO activation and C-C coupling to form value-added products. This article aims to highlight the challenges in the field of photocatalytic CO2 conversion and the connection of photocatalysis with conventional catalytic systems, providing the readers the opportunities to join the research. © 2020 The Royal Society of Chemistry.
Number of references: 50
Main heading: Carbon dioxide
Controlled terms: Reduction - Charge transfer - Hydrogenation - Product design
Uncontrolled terms: Catalytic system - CO2 hydrogenation - Photocatalytic reduction - Photocatalytic water splitting - Reduction products - Selective reduction - Syngas conversion - Value added products
Classification code: 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 913.1 Production Engineering
DOI: 10.1039/c9cs00920e
Funding Details: Number: 2017YFA0207301, Acronym: -, Sponsor: -; Number: -, Acronym: CAS, Sponsor: Chinese Academy of Sciences; Number: 2019ZDLSF05-05-01, Acronym: -, Sponsor: -; Number: 51902253,21725102,91961106, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: QYZDB-SSW-SLH018, Acronym: -, Sponsor: -;
Funding text: This work was financially supported in part by the National Key R&D Program of China (2017YFA0207301), NSFC (21725102, 51902253, 91961106), the CAS Key Research Program of Frontier Sciences (QYZDB-SSW-SLH018), Shannxi Key Research and Development Project (2019ZDLSF05-05-01), and the CAS Interdisciplinary Innovation Team.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

70. Pore–throat structure and fractal characteristics of tight sandstones in Yanchang Formation, Ordos Basin

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Authors: Qu, Yiqian (1); Sun, Wei (1); Tao, Rongde (2); Luo, Bin (3); Chen, Lei (4); Ren, Dazhong (1, 5)
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Article number: 104573
Language: English
ISSN: 02648172
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Pore–throat structure is a key factor that influences the storage and fluid flow capacity of tight sandstone reservoirs. By performing petro-physical characteristic tests, scanning electron microscopy, and casting thin sections, the main pore types of tight sandstone reservoir samples collected from the Upper Triassic Yanchang Formation in the Baibao area of the Southwest Ordos Basin in China were identified to be dissolved pores, intergranular pores, intercrystalline pores, and micro-cracks. Meanwhile, the size of the pore–throat was widely distributed, whereas its shape varied. Given the advantages and disadvantages of various technical methods, high-pressure mercury injection (HPMI) and nuclear magnetic resonance (NMR) technology were used to study the distribution characteristics of a full-size pore–throat. All 10 samples showed bimodal and unimodal distribution characteristics, and their distribution characteristics were consistent with the results of the petro-physical characteristics, high-pressure mercury injection,

and movable fluid saturation tests. The throat distribution characteristics of the reservoir were studied by applying constant-rate mercury injection (CRMI), and the throat radius ranged from 0.43 μm to 9.76 μm with an average of 3.34 μm. The fractal features of the pore–throat and throat were quantitatively characterized by CRMI. The fractal curves of the pore–throat showed self-similarities, and the fractal dimension D ranged between 2.6297 and 2.9529 with an average of 2.7865. The fractal curves of the throats were broken down into two segments, and the fractal dimensions corresponded to two ranges, namely, the small (Dt1) and large throats (Dt2) fractal dimensions. The average of fractal dimension Dt1 was 2.9170, and the average of fractal dimension Dt2 was higher than that of Dt1 with an average of 2.9828, thereby indicating the complex structure and strong heterogeneity of the former. The fractal dimensions D, Dt1, and Dt2 were negatively correlated with permeability, movable fluid saturation, average throat radius, clay mineral content, and laumontite content, positively correlated with quartz content, and showed poor correlation with feldspar. Compared with Dt2, the fractal dimension Dt1 had a higher correlation with pore–throat parameters and mineral content. Given the higher self-similarity of small throats, their distribution is considered highly homogeneous. © 2020

Number of references: 48
Main heading: Fractal dimension
Controlled terms: Sandstone - Scanning electron microscopy - Textures - Flow of fluids - Metamorphic rocks - Feldspar - Nuclear magnetic resonance
Uncontrolled terms: Casting thin sections - Distribution characteristics - Fractal characteristics - Intercrystalline pores - Nuclear magnetic resonance(NMR) - Physical characteristics - Strong heterogeneities - Tight sandstone reservoirs
Classification code: 482.2 Minerals - 631.1 Fluid Flow, General - 921 Mathematics
Numerical data indexing: Size 3.34e-06m, Size 4.30e-07m to 9.76e-06m
DOI: 10.1016/j.marpetgeo.2020.104573
Funding Details: Number: 2018M643554, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 18LCD01, Acronym: NWU, Sponsor: Northwest University; Number: PLC20190502, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: KF 2019-1,ZP 2018-2, Acronym: CRECU, MLR, Sponsor: Key Laboratory of Coal Resources Exploration and Comprehensive Utilization, Ministry of Land and Resources;
Funding text: This research was co-funded by the Open Fund of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation(Chengdu University of Technology), grant number: PLC20190502 Opening Foundation of State Key Laboratory of Continental Dynamics, Northwest University , grant number 18LCD01 ; China Postdoctoral Science Foundation , grant number 2018M643554 ; Open Fund of Key Laboratory of Coal Resources Exploration and Comprehensive Utilization, Ministry of Land and Resources , grant number KF 2019-1 , ZP 2018-2 . The authors sincerely thank Department of Geology of Northwest University and the No.7 Oil Production Plant of PetroChina Changqing Oilfield Company for providing the drill cores used in this study.This research was co-funded by the Open Fund of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation(Chengdu University of Technology), grant number: PLC20190502Opening Foundation of State Key Laboratory of Continental Dynamics, Northwest University, grant number 18LCD01; China Postdoctoral Science Foundation, grant number 2018M643554; Open Fund of Key Laboratory of Coal Resources Exploration and Comprehensive Utilization, Ministry of Land and Resources, grant number KF 2019-1, ZP 2018-2. The authors sincerely thank Department of Geology of Northwest University and the No.7 Oil Production Plant of PetroChina Changqing Oilfield Company for providing the drill cores used in this study.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

71. Novel Pd-loaded urchin-like (NH4)xWO3/WO3 as an efficient visible-light-driven photocatalyst for partial conversion of benzyl alcohol

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Authors: Lv, Ying (1); Xu, Zhanglian (2); Kobayashi, Hisayoshi (3); Nakane, Koji (4)
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Corresponding authors: Xu, Zhanglian(xuzhanglian@xjtu.edu.cn); Kobayashi, Hisayoshi(xuzhanglian@xjtu.edu.cn)
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Volume: 845

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Article number: 156225
Language: English
ISSN: 09258388
CODEN: JALCEU
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Photocatalytic oxidation of organic compounds by solar light is a promising strategy for environmentally benign conversion processes. Herein, we first report an urchin-like Pd/(NH4)xWO3/WO3 with three-dimensional hierarchical microstructure prepared through a thiourea-assisted solvothermal method followed by calcination under the reductive atmosphere. The Pd/(NH4)xWO3/WO3 exhibits higher selectivity in comparison to Pd/WO3 nanorods in the partial conversion of aqueous benzyl alcohol into benzaldehyde (e.g., 80% selectivity for benzaldehyde production with ca. 84% conversion of benzyl alcohol) under visible light irradiation. The preferential generation of hydroxyl radicals from water on the (NH4)xWO3/WO3 surface in the initial reaction stage was responsible for the high selectivity for benzaldehyde production because hydroxyl radicals react with benzyl alcohol much more efficiently than benzaldehyde. DFT calculations demonstrate that the energy barrier of the reaction between benzyl alcohol and hydroxyl radicals largely decreased due to the photo-excited triplet states of (NH4)xWO3/WO3, while such a trend in the energy barrier was not observed for other photocatalysts. On the other hand, with extended irradiation time, a large amount of hydrogen peroxide, which was produced by the multi-electron reduction of oxygen molecules, accumulates on the Pd/(NH4)xWO3/WO3 due to the low activity of the Pd cocatalyst. The generated hydrogen peroxide preferentially eliminated the photoexcited holes when the concentrations of benzaldehyde increased, thus inhibiting the peroxidation of benzaldehyde by holes. The Pd/(NH4)xWO3/WO3 may provide a feasible strategy for the photocatalytic oxidation of various other organic compounds due to its unique reactivity shown in this study. © 2020 Elsevier B.V.
Number of references: 56
Main heading: Oxidation
Controlled terms: Hydrogen peroxide - Irradiation - Light - Solar light - Energy barriers - Surface reactions - Nanorods
Uncontrolled terms: Environmentally benign - Hierarchical microstructures - Photocatalytic oxidations - Photoexcited triplet state - Reductive atmospheres - Solvothermal method - Visible light driven photocatalysts - Visible-light irradiation
Classification code: 641.1 Thermodynamics - 657.1 Solar Energy and Phenomena - 741.1 Light/Optics - 761 Nanotechnology - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 933 Solid State Physics
Numerical data indexing: Percentage 8.00e+01%, Percentage 8.40e+01%
DOI: 10.1016/j.jallcom.2020.156225
Funding Details: Number: HN6J002, Acronym: XJTU, Sponsor: Xi’an Jiaotong University; Number: 19JK0654, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: -, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
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Compendex references: YES
Database: Compendex
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72. Influence of Both Soil Properties and Geometric Parameters on Failure Mechanisms and Stability of Two-Layer Undrained Slopes (*Open Access*)

Accession number: 20203209027495
Authors: Guo, Shuangfeng (1, 2); Li, Ning (1); Liu, Wenpeng (3); Ma, Zongyuan (1); Liu, Naifei (4); Lv, Gao (5)
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Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: The stability of the two-layer undrained clay slopes should be given considerable attention since they are commonly observed in nature and in manmade structures, and they traditionally have low stability. Therefore, with the elastoplastic finite element method, this paper thoroughly explores the influence of the soil strength parameter cu, slope angle β, and slope depth ratio DH on the slope stability and failure mechanisms by the wide-ranging parametric changes. The aims of this study are also to find the critical strength ratio (cu2/cu1)crit and the maximum values of the stability number Nc that were observed in the parametric studies. Numerical results are displayed in the form of charts to give Nc and (cu2/cu1)crit as a function of cu, β, and DH. Moreover, influences of DH and β on Nc and failure mechanisms are examined in this study. The results of numerical analysis demonstrate that cu2/cu1 significantly affects both the critical failure mechanism and the stability of the two-layer undrained slope. Improved knowledge of the location of the critical failure mechanism allows for accurately estimating the stability of the two-layer undrained slopes for future strengthening measurements to preserve stability. © 2020 Shuangfeng Guo et al.
Number of references: 44
Main heading: Slope stability
Controlled terms: Failure (mechanical)
Uncontrolled terms: Critical failures - Critical strength - Elastoplastic finite element method - Failure mechanism - Man-made structures - Numerical results - Parametric changes - Parametric study
Classification code: 406.2 Roads and Streets
DOI: 10.1155/2020/4253026
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Funding text: The first author of the paper is grateful to the Chinese Scholarship Council (CSC) for providing a scholarship to conduct the research described in this paper at the Colorado School of Mines, Golden, CO, USA (CSC no. 201708610108). +is study was supported by the Shaanxi Natural Science Foundation (Grant no. 2019JQ-756) and the Shaanxi Province Science Foundation for Youths (Grant no. 2018JQ5203).
Compendex references: YES
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73. Interface and surface engineering of hematite photoanode for efficient solar water oxidation

Accession number: 20203008963524
Authors: Chen, Xiangyan (1); Fu, Yanming (1); Hong, Liu (2); Kong, Tingting (3); Shi, Xiaobo (2); Wang, Guangxu (2); Qu, Le (3, 4); Shen, Shaohua (1)
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Publisher: American Institute of Physics Inc.
Abstract: Engineering the interface and surface structures of semiconductor-based photoelectrodes for improved charge transfer dynamics and promoted water redox reaction kinetics is essential to achieve efficient photoelectrochemical (PEC) water splitting. In this work, α–Fe2O3 nanorods, successively coated with TiO2 and CoOx thin layers, were reported as the photoanode for solar-driven water oxidation. The obtained α–Fe2O3/TiO2/CoOx photoanode exhibits superior PEC performance as compared to bare α–Fe2O3, with a 3.3-time improvement in photocurrent density at 1.23 V vs reversible hydrogen electrode. This significant enhancement results from the formed heterojunction between α–Fe2O3 and TiO2 for the accelerated photogenerated charge separation and transfer as well as the passivated surface defects by the TiO2 overlayer for reduced charge recombination. Additionally, the existence of CoOx as the oxygen evolution catalyst significantly facilitates the surface reaction kinetics and thus reduces the overpotential for water oxidation. This study demonstrates a collaborative strategy of interface and surface engineering to design novel structures of α–Fe2O3 based photoanodes for highly efficient solar water oxidation. © 2020 Author(s).
Number of references: 57
Main heading: Titanium dioxide
Controlled terms: Charge transfer - Cobalt compounds - Hematite - Reaction kinetics - Heterojunctions - Redox reactions - Oxidation - Photoelectrochemical cells - Surface defects - Surface reactions - Association reactions - Nanorods
Uncontrolled terms: Charge recombinations - Charge-transfer dynamics - Collaborative strategies - Hematite photoanode - Photocurrent density - Photoelectrochemicals - Photogenerated charge - Reversible hydrogen electrodes
Classification code: 482.2 Minerals - 702.1 Electric Batteries - 714.2 Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 933 Solid State Physics - 951 Materials Science
DOI: 10.1063/5.0009072
Funding Details: Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2018YFB1502003, Acronym: -, Sponsor: National Basic Research Program of China (973 Program);
Funding text: The authors acknowledge the financial support from the Open Fund (Grant No. PLC20190702) of the State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology), the National Key Research and Development Program of China (Grant No. 2018YFB1502003), and the National Program for Support of Top-notch Young Professionals.
Compendex references: YES
Database: Compendex
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74. Comparison of the Absolute Adsorption of CH4, n-C4H10, and CO2 on Shale

Accession number: 20202008665393
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Language: English

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E-ISSN: 15205029
CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Comprehensive knowledge of the absolute adsorption of light hydrocarbons and CO2 is significant for shale reservoir assessment and CO2 stimulation optimization. In this work, excess adsorption isotherms are first obtained for CH4, n-C4H10, and CO2 on typical shale. The simplified local density (SLD) theory is then used to obtain the adsorption-phase density for CH4, n-C4H10, and CO2 in organic pores, which is then employed for absolute adsorption calculation. The absolute adsorption of CH4, n-C4H10, and CO2 is compared to prove the potential of CO2 for shale hydrocarbon recovery as well as CO2 sequestration in shale reservoirs. The results show that CH4, n-C4H10, and CO2 can form adsorption layers and result in a much higher adsorbed phase density than that at the pore center. Based on the SLD theory, C4H10 shows the highest adsorbed density on the shale surface than CO2 and CH4 at all pressure ranges. In addition, absolute adsorption is higher than the excess values in line with the previous molecular simulation methods. Absolute adsorption is calculated in the order of n-C4H10 > CO2 > CH4, indicating the suitability of CO2 for CH4 recovery but also that it may not be feasible for recovering heavier hydrocarbons, i.e., n-C4H10. This study provides insights into the mechanism of shale resources recovery using CO2 method, which is theoretically crucial for shale resource assessment and production optimization. © 2020 American Chemical Society.
Number of references: 51
Main heading: Carbon dioxide
Controlled terms: Recovery - Adsorption - Hydrocarbons - Shale
Uncontrolled terms: Adsorption calculations - Excess adsorption isotherms - Hydrocarbon recovery - Light hydrocarbon - Molecular simulations - Production optimization - Reservoir assessment - Resource assessments
Classification code: 802.3 Chemical Operations - 804.1 Organic Compounds - 804.2 Inorganic Compounds
DOI: 10.1021/acs.energyfuels.0c00278
Funding Details: Number: YJSYZX19SKF0002, Acronym: -, Sponsor: -; Number: ZX20190399, Acronym: -, Sponsor: -; Number: ZX20190438, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: 19JK0670, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2019JQ-808, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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Compendex references: YES
Database: Compendex
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75. Investigation on the leading phase of Al2O3/YAG eutectic crystals prepared by directional solidification (*Open Access*)

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Authors: Zhong, Yujie (1, 2); Wang, Shengjie (1); Liu, Yangru (1); Gao, Qian (1); Wang, Kuikui (3); Wang, Xu (4)
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Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: The leading phase of eutectic materials has an effect on the solidification behavior and further influences on their properties. Many studies have been carried out on the leading phase of metal/metal and nonmetal/metal eutectic alloys. Nevertheless, few studies were focused on no-metal/no-metal eutectic materials. In the present work, the leading phase in the Al2O3/Y3Al5O12 eutectic crystal during solidification was investigated by electron back-scattered diffraction and discussed according to the classical solidification theory. It is observed that the Y3Al5O12 was the leading phase. The leading phase was determined by the wetting angle and the undercooling. At a given wetting angle, the Y3Al5O12 would be the leading phase when the undercooling exceeds the critical value. © 2020 The Authors. International Journal of Ceramic Engineering & Science published by Wiley Periodicals LLC. on behalf of American Ceramic Society.
Number of references: 26
Main heading: Aluminum oxide
Controlled terms: Alumina - Eutectics - Solubility - Undercooling - Wetting - Yttrium aluminum garnet
Uncontrolled terms: Al2O3/Y3al5O12 eutectic crystal - Eutectic crystals - Eutectic materials - Eutectic solidification - Leading-phase - Property - Solidification behaviors - Undercoolings - Wetting angle - YAG
Classification code: 531.2 Metallography - 641.1 Thermodynamics - 801.4 Physical Chemistry - 804.2 Inorganic Compounds
DOI: 10.1002/ces2.10055
Funding Details: Number: 6140759040102,6140923040203, Acronym: -, Sponsor: Foundation of Equipment Pre-research Area; Number: 51701156,51804252, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017B030314010, Acronym: -, Sponsor: Guangdong Provincial Key Laboratory of Advanced Energy Storage Materials;
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Compendex references: YES
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76. Numerical taxonomy of Miocene Trapa L. fossil fruits from eastern Zhejiang, China

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Authors: Xiao, Liang (1, 4, 5); Wang, Xing (1); Li, Xuemei (2); Li, Xiangchuan (1, 5); Jia, Hui (3); Sun, Nan (1); Liang, Jiaqi (1); Wang, Qin (1); Li, Jiangxiao (1); Yong, Yuanyuan (1)
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Language: Chinese
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Document type: Journal article (JA)
Publisher: Science Frontiers editorial department
Abstract: Abundant Trapa L. fruit fossils are found in the late Miocene Shengxian Formation in Tiantai, eastern Zhejiang. The fossils are well preserved with rich three-dimensional characteristics. However, the identification and

taxonomy of Trapa L. have been controversial because of its large taxonomic variations yet subtle differences in the fossil's three-dimensional features. Since the characteristics of Trapa L. fossils are distinct and easy to measure and record, we used numerical statistics methods to classify Trapa L. fossils. The main methods include cluster and principal component analyses. The purpose of this research is to identify the Trapa fossil fruits and find the guiding characters for their identification and classification. First, we performed numerical analysis on living Trapa fruits and obtained good taxonomical result. Next, we analyzed Trapa fossil fruits. We believe the analyses can classify Trapa fossils and at the same time eliminate redundant characteristics used for identification. Finally, we obtained some discrimination characteristics, including fruit body shape, with or without head, valgus head, fruit top shape, upper or lower horn growth direction, length of lower horns, and number of degenerate tuberculate lower horns. Based on these characteristics, the fossil fruits can be effectively divided into two taxa.
Number of references: 35
Main heading: Fruits
Controlled terms: Numerical methods - Biological materials preservation - Cluster analysis - Principal component analysis
Uncontrolled terms: Fruit body - Growth directions - Late Miocene - Miocene - Numerical taxonomy - Statistics method - Three-dimensional characteristics - Zhejiang
Classification code: 461.2 Biological Materials and Tissue Engineering - 723 Computer Software, Data Handling and Applications - 821.4 Agricultural Products - 921.6 Numerical Methods - 922.2 Mathematical Statistics
DOI: 10.13745/j.esf.sf.2020.4.24
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

77. Adsorption Behavior of CH4and C2H6on Shale under the Influence of CO2and Flue Gas

Accession number: 20203609129252
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Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: CO2 injection has been accepted as a suitable method for enhancing shale hydrocarbon recovery as well as achieving CO2 storage in shale reservoirs. In this study, flue gas is proposed as a better injection gas for shale resource recovery. The objective of this work is conducted to investigate how introduced CO2 and flue gas affect the adsorption behavior of CH4 and C2H6, which are two main components in shale gas, on shale, which is critical for understanding the fundamental mechanism of shale gas recovery. In this work, the adsorption isotherms are first measured to evaluate the relative adsorption capacity of CO2, flue gas, CH4, and C2H6 on typical shale samples. The low-field nuclear magnetic resonance technique is consequently applied to study the influence of injected CO2 and flue gas on the adsorption behavior of CH4 and C2H6 at the reservoir pressure and temperature conditions. Test results show that flue gas presents the highest adsorption capacity on shale, which is followed by C2H6, CO2, and CH4, respectively. On the basis of the measured T2 signals, CH4 and C2H6 exist in shale within the two patterns, i.e., the adsorbed pattern in pores and the free-state pattern at the pore center. After injection of CO2 and flue gas, the amount of adsorbed CH4 is reduced, accompanying with the increase of the quantity of free gas state that appeared at

the pore center. In comparison to CO2, flue gas can further replace adsorbed CH4 and C2H6 from the shale surface, suggesting more feasibility of flue gas for enhancing CH4 and C2H6 recovery. This study may inspire new strategies that can be applied for shale reservoir development; more importantly, it may provide a new way for the usage of flue gas for energy supply while reducing the possibility for environmental pollution.
Number of references: 52
Main heading: Flue gases
Controlled terms: Recovery - Adsorption - Carbon dioxide - Flues - Shale gas
Uncontrolled terms: Adsorption behavior - Adsorption capacities - Environmental pollutions - Fundamental mechanisms - Hydrocarbon recovery - Low field nuclear magnetic resonance - Reservoir development - Reservoir pressures
Classification code: 451.1 Air Pollution Sources - 512.2 Natural Gas Deposits - 522 Gas Fuels - 802.3 Chemical Operations - 804.2 Inorganic Compounds
DOI: 10.1021/acs.energyfuels.0c00339
Funding Details: Number: PRP/open-1909, Acronym: CUPB, Sponsor: China University of Petroleum, Beijing; Number: 2019JQ-823, Acronym: -, Sponsor: -; Number: YJSYZX19SKF0003, Acronym: -, Sponsor: -; Number: 2019D-5007-0204, Acronym: -, Sponsor: PetroChina Innovation Foundation;
Funding text: The authors acknowledge the financial support from the Open Foundation (YJSYZX19SKF0003) of Shaanxi Key Laboratory of Lacustrine Shale Gas Accumulation and Exploitation, Open Foundation of Shaanxi Key Laboratory of Carbon Dioxide Sequestration and Enhanced Oil Recovery, PetroChina Innovation Foundation (2019D-5007-0204), the Natural Science Basic Research Plan in Shaanxi Province of China (Grant 2019JQ-823), and the Foundation of State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum, Beijing (PRP/open-1909) to Xing Huang.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

78. Experimental study on oil droplet breakup under the action of turbulent field in modified concentric cylinder rotating device

Accession number: 20203409084607
Authors: Tian, Yu (1); Tian, Yangyang (2); Shi, Guoxin (3); Zhou, Bo (3); Zhang, Chunying (4); He, Limin (4)
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Article number: 087105
Language: English
ISSN: 10706631
E-ISSN: 10897666
CODEN: PHFLE6
Document type: Journal article (JA)
Publisher: American Institute of Physics Inc.
Abstract: This paper describes the breakage behaviors of oil droplets under different flow conditions when flowing turbulently in a modified concentric cylinder rotating device. The annular flow field in the modified device is locally isotropic turbulence, and the oil droplet diameter is only influenced by the turbulent kinetic energy (TKE) dissipation rate. The TKE dissipation rate distribution under experimental conditions is obtained by the Reynold stress turbulence model. The droplet-size distribution of each sampling tube is studied by experiments, and the influence rules of oil concentration, inlet droplet diameter, and TKE dissipation rate on the droplet Sauter diameter are obtained. Based on the Hinze model, the model of the maximum stable diameter of droplets under medium turbulence intensity is

established, and the accuracy of the model is verified by experiments. The new model provides a scientific basis for predicting the oil droplet breakage and has a wide range of applications. © 2020 Author(s).
Number of references: 34
Main heading: Kinetics
Controlled terms: Turbulence models - Kinetic energy - Drop breakup - Cylinders (shapes)
Uncontrolled terms: Breakage behavior - Concentric cylinders - Droplet size distributions - Experimental conditions - Isotropic turbulence - Reynold stress turbulence models - Turbulence intensity - Turbulent kinetic energy
Classification code: 631.1 Fluid Flow, General - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids
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79. The connectivity evaluation among wells in reservoir utilizing machine learning methods (*Open Access*)

Accession number: 20201308351801
Authors: Du, Shuyi (1, 6); Wang, Ruifei (2); Wei, Chenji (3); Wang, Yuhe (4); Zhou, Yuanchun (5, 6); Wang, Jiulong (1, 6); Song, Hongqing (1, 6)
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Volume: 8
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Publication year: 2020
Pages: 47209-47219
Article number: 9016060
Language: English
E-ISSN: 21693536
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: Machine learning is becoming prevalent increasingly for reservoir characteristics analysis in the petroleum industry. This investigation proposes an alternative way for evaluating interwell connectivity in oil fields utilizing machine learning. In this study, three-dimensional convolutional neural network (CNN) was utilized to establish a deep learning model, which can invert interwell connectivity combining with dynamic production data. Different from traditional methods that try to construct mathematical formulas to calculate the connectivity among wells basing on physical laws, deep learning model can capture autonomously the changing characteristics of dynamic production data by training continuously and provide a potential to characterize the interwell connectivity accurately without physical model. At the same time, the back propagation (BP) neural network has also been built to analyze the prediction performance, which are compared with CNN. The results demonstrate that CNN has better performance in predicting the connectivity with the overall AARD below 15.35%. Moreover, the connectivity predicted by CNN is closest to the real connectivity factor compared with some traditional methods. The evaluation method on interwell connectivity proposed by this paper provides effective guidance for the secondary development of both conventional and unconventional reservoirs. © 2013 IEEE.
Number of references: 41
Main heading: Oil fields

Controlled terms: Dynamics - Backpropagation - Convolution - Convolutional neural networks - Deep learning - Petroleum industry
Uncontrolled terms: Back propagation neural networks - BP neural networks - Characteristics of dynamics - Dynamic production - interwell connectivity - Machine learning methods - Reservoir characteristic - Unconventional reservoirs
Classification code: 461.4 Ergonomics and Human Factors Engineering - 512.1.1 Oil Fields - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence
Numerical data indexing: Percentage 1.53e+01%
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80. Investigation of variation in shale gas adsorption capacity with burial depth: Insights from the adsorption potential theory

Accession number: 20194607675746
Authors: Huang, Hexin (1, 2, 3); Li, Rongxi (1); Jiang, Zhenxue (3); Li, Jian (4); Chen, Lei (5)
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Article number: 103043
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: In this study, the Polanyi theory was applied to investigate variation in shale gas adsorption capacity with burial depth. Analyses were implemented on background data of two shale samples with respective TOC contents of 4.00% and 4.51% TOC, accompanied by combination of the Polanyi theory and isothermal adsorption parameters. Shale gas adsorption capacity was found to first increase and then decrease as the burial depth grew, and the burial depth corresponding to the maximum adsorption capacity was basically constant within the study area. Specifically, pressure coefficient had the largest impact on the minimum adsorption potential, reaching 1.721 mol/kJ, while the ground temperature gradient was the most influential factor on the burial depth corresponding to the maximum adsorption capacity, reaching 1080 m. When the burial depth was shallower than 3200 m, the pressure coefficient dominated, whereas in deeper parts, the ground temperature gradient became dominant. © 2019 Elsevier B.V.
Number of references: 66
Main heading: Thermal gradients
Controlled terms: Gas adsorption - Adsorption isotherms - Shale gas
Uncontrolled terms: Adsorption capacities - Adsorption potential - Adsorption potential theories - Gas adsorption capacity - Isothermal adsorption - Ordos Basin - Pressure coefficients - Yanchang Formation
Classification code: 512.2 Natural Gas Deposits - 522 Gas Fuels - 641.1 Thermodynamics - 802.3 Chemical Operations
Numerical data indexing: Percentage 4.00e+00%, Percentage 4.51e+00%, Size 1.08e+03m, Size 3.20e+03m
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

81. N-doped graphene-wrapped TiO2 nanotubes with stable surface Ti3+ for visible-light photocatalysis

Accession number: 20195207925298
Authors: Zheng, Peng (1); Zhou, Wei (1); Wang, Yibing (1); Ren, Dazhong (2); Zhao, Jie (3); Guo, Shouwu (4)
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Corresponding author: Zheng, Peng(zhengpeng@sust.edu.cn)
Source title: Applied Surface Science
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Article number: 144549
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ISSN: 01694332
CODEN: ASUSEE
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Due to the merits of visible-light absorption and high conductivity, Ti3+ is a main focus among the modifications of TiO2. However, surface Ti3+ is unstable. Herein, surface-stable Ti3+ in an N-doped rGO-coated TiO2 nanotube sample is prepared. The N-doping introduced Ti-C bonds and an abundance of surface Ti3+, which produced several mid-gap states. These properties allow the composite to absorb nearly the full visible-light spectrum. Owing to the advantages of a broad visible-light absorption, short diffusion distance in the nanotube, and a good heterojunction, the composite exhibits a good photocatalytic activity. Under visible light and without Pt as a cocatalyst, methylene blue was degraded within 40 mins, and the H2 production rate is as high as 720 μmol g-1 h-1. Due to the synergistic effect of N doping and Ti-C bond formation, the configuration of surface Ti3+ is stabilized by a charge-transfer resonance mechanism. The tightly coated graphene also plays a vital role in protecting the surface Ti3+. Even after storage for one year, the photocatalytic activity and the EPR signal intensity from Ti3+ paramagnetic states remain unchanged within experimental error. It suggests that the surface Ti3+ concentration, and the properties of the composite are stable with time. © 2019 Elsevier B.V.
Number of references: 41
Main heading: Titanium dioxide
Controlled terms: Charge transfer - Graphene - Doping (additives) - Heterojunctions - Light absorption - Light - Photocatalytic activity - Hydrogen production - Aromatic compounds - Nanotubes
Uncontrolled terms: Experimental errors - H2 production - Protecting the surface - Resonance mechanism - Stable - TiO2 tube@rGO - Visible light absorption - Visible-light photocatalysis
Classification code: 522 Gas Fuels - 714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics - 761 Nanotechnology - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 933.1 Crystalline Solids
Numerical data indexing: Time 2.40e+03s
DOI: 10.1016/j.apsusc.2019.144549

Funding Details: Number: 51702200, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: KFJJ-XB-2019-5, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: The authors acknowledge the financial support from National Natural Science Foundation of China (No. 51702200) and Engineering Research Center of Development and Management for Low to Ultra-Low Permeability Oil & Gas Reservoirs in West China (Ministry of Education; Xi'an Shiyou University) (No.: KFJJ-XB-2019-5).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

82. Tailoring degradation-resistant thermal barrier coatings based on the orientation of spontaneously formed pores: From retardation to self-improvement

Accession number: 20194607676661
Authors: Li, Guang-Rong (1); Wang, Li-Shuang (2); Zhang, Wei-Wei (3, 4); Yang, Guan-Jun (1); Chen, Xue-Feng (5); Zhang, Wei-Xu (6)
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Source title: Composites Part B: Engineering
Abbreviated source title: Compos Part B: Eng
Volume: 181
Issue date: 15 January 2020
Publication year: 2020
Article number: 107567
Language: English
ISSN: 13598368
CODEN: CPBEFF
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Thermal barrier coatings (TBCs) endow metal components with exceptional endure capability to withstand high temperatures over their bearable limits. Thus, TBCs are indispensable in a wide range of applications related to high temperatures. However, the thermal barrier performance degrades by at least 50% during service, which remains a critical challenge for these coatings. Herein, degradation-resistant TBCs were achieved using composited structures. Thermal insulation 2D pores were spontaneously formed during thermal exposure. Moreover, the degree of resistance was optimized from 20% to 50% by tailoring the orientation of the 2D pores. Thus, the thermal barrier performance was self-improved. A detailed examination suggests that scale-progressive healing of the initial pores is primarily responsible for the degradation mechanism. Analysis of the orientation of the spontaneously-formed 2D pores on thermal resistance reveals that this accounts for the self-improved thermal barrier performance. These results will guide the advanced design of TBCs for future applications. © 2019 Elsevier Ltd
Number of references: 56
Main heading: Thermal barrier coatings
Controlled terms: Degradation - Thermal insulation
Uncontrolled terms: Composited - Degradation resistance - Preferred orientations - Self-improving - Spontaneously-formed pores
Classification code: 413.2 Heat Insulating Materials - 802.2 Chemical Reactions
Numerical data indexing: Percentage 2.00e+01% to 5.00e+01%, Percentage 5.00e+01%
DOI: 10.1016/j.compositesb.2019.107567
Funding Details: Number: -, Acronym: AFM, Sponsor: Advanced Foods and Materials Canada; Number: 20190403, Acronym: CAST, Sponsor: China Association for Science and Technology; Number: 51801148, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: MEAE, Sponsor: The Ministry of Economic Affairs and Employment; Number: 2019T120903, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 201806285079, Acronym: CSC, Sponsor: China Scholarship Council; Number: 2019JQ-380,

Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: JZX7Y20190262062001, Acronym: -, Sponsor: Domain Foundation of Equipment Advance Research of 13th Five-year Plan;
Funding text: This work was supported by the Domain Foundation of Equipment Advance Research of 13th Five-year Plan (grant number JZX7Y20190262062001), the National Natural Science Foundation of China (grant number 51801148); the China Postdoctoral Science Foundation (grant number 2019T120903); the Young Talent fund of University Association for Science and Technology in Shaanxi , China (grant number 20190403). Dr. W. W. Zhang thanks for the financial support from the Natural Science Foundation of Shaanxi Province (grant number 2019JQ-380). The financial support from China Scholarship Council(CSC) to be a postdoctoral researcher in Forschungszentrum Jülich would be greatly appreciated by Dr. G.R. Li (grant number 201806285079). Authors would thank Dr. Hua Xie for the characterization of EBSD, TEM and AFM, Mr. Hong-Min Mu and Mr. Guo-Wang Zhang for the sample preparation. Appendix AThis work was supported by the Domain Foundation of Equipment Advance Research of 13th Five-year Plan (grant number JZX7Y20190262062001), the National Natural Science Foundation of China (grant number 51801148); the China Postdoctoral Science Foundation (grant number 2019T120903); the Young Talent fund of University Association for Science and Technology in Shaanxi, China (grant number 20190403). Dr. W. W. Zhang thanks for the financial support from the Natural Science Foundation of Shaanxi Province (grant number 2019JQ-380). The financial support from China Scholarship Council(CSC) to be a postdoctoral researcher in Forschungszentrum J? lich would be greatly appreciated by Dr. G.R. Li (grant number 201806285079). Authors would thank Dr. Hua Xie for the characterization of EBSD, TEM and AFM, Mr. Hong-Min Mu and Mr. Guo-Wang Zhang for the sample preparation.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

83. Numerical investigation of on-chip wavelength conversion based on InP/In1-xGaxAsyP1-y semiconductor waveguide platforms (*Open Access*)

Accession number: 20201608435032
Authors: Wen, Jin (1, 5, 6); Li, Kang (2); Gong, Yongkang (3); Copner, Bethan (2); Hughes, Ben (4); Campbell, Michael A. (4); Lazzaini, Mattia (4); Duan, Lina (1); Ma, Chengju (1); Fan, Wei (1); Jia, Zhenan (1, 5, 6); Fu, Haiwei (1, 5, 6); Copner, Nigel (2)
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Publisher: Elsevier B.V., Netherlands
Abstract: We design the high confinement InP/In1-xGaxAsyP1-y semiconductor waveguides and investigate the effective wavelength conversion based on this platform. Efficient confinement and mode field area fluctuation at different wavelength is analyzed to achieve the high nonlinear coefficient. The numerical results show that nearly zero phase-mismatch condition can be satisfied through dispersion tailoring of InP/In1-xGaxAsyP1-y waveguides, and the wavelength conversion ranging over 40 nm with the maximum conversion efficiency -26.3 dB is achieved. Meanwhile, the influences of the doping parameter y and pumping wavelength on the bandwidth and conversion efficiency are also discussed and optimized. Our demonstration of the excellent all-optical wavelength conversion properties of the InP/In1-xGaxAsyP1-y waveguides could pave the way towards direct integration telecom band devices on stand semiconductor platforms. © 2020
Number of references: 29
Main heading: Four wave mixing

Controlled terms: III-V semiconductors - Conversion efficiency - Semiconductor devices - Semiconductor doping - Indium phosphide - Optical signal processing - Semiconducting indium phosphide - Optical frequency conversion
Uncontrolled terms: All-optical wavelength conversion - Direct integration - Doping parameters - High confinement - Numerical investigations - Numerical results - Pumping wavelength - Semiconductor waveguide
Classification code: 525.5 Energy Conversion Issues - 712.1 Semiconducting Materials - 712.1.2 Compound Semiconducting Materials - 714.2 Semiconductor Devices and Integrated Circuits - 741.1.1 Nonlinear Optics - 804.2 Inorganic Compounds
Numerical data indexing: Size 4.00e-08m
DOI: 10.1016/j.optcom.2020.125921
Funding Details: Number: 2018KJXX-042, Acronym: -, Sponsor: -; Number: 2019JM-084, Acronym: -, Sponsor: -; Number: 61505160, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by the National Natural Science Foundation of China under Grant No. 61505160 , the Innovation Capability Support Program of Shaanxi China (Program No. 2018KJXX-042), the Natural Science Basic Research Program of Shaanxi China (Program No. 2019JM-084), the 2015 Foshan Technology Innovation Group Project (Advanced Solid State Light Source Application and Innovation Team) and the National Physical Laboratory Directors' Science and Engineering Fund Investigators Award UK (project number 06. 2019).
Compendex references: YES
Open Access type(s): All Open Access, Green
Database: Compendex
Data Provider: Engineering Village

84. Measurement and Modeling of the Adsorption/Desorption Behavior of Light Hydrocarbons on Shale

Accession number: 20202208758265
Authors: Wang, Chen (1, 2); Kong, Shaoqi (3); Liu, Yueliang (4, 5); Gao, Yuan (1, 6)
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Corresponding author: Kong, Shaoqi(ksq3631@outlook.com)
Source title: Energy and Fuels
Abbreviated source title: Energy Fuels
Volume: 34
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Language: English
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E-ISSN: 15205029
CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Understanding the adsorption/desorption behavior, as the primary phenomenon in shale reservoirs, is crucial for shale resource production, which is necessary in approximating the gas-in-place estimation. CH4 and C2H6 in shale gas are two common dominating gas components. We first measure the adsorption/desorption isotherms of CH4 and C2H6 at temperatures of 313.15-333.15 K. The maximum operating pressures for CH4 and C2H6 are 50 and 30 bar, respectively. Relationships of the physical properties of core samples with adsorption capacities of CH4 and C2H6 are analyzed. In addition, the accuracy of four popular adsorption models, i.e., Langmuir, Brunauer-Emmett-Teller (BET), Dubinin-Astakhov (D-A), and Dubinin-Radushkevich (D-R), is quantitatively evaluated by matching with the measured data. Test results show that C2H6 shows more obvious adsorption/desorption hysteresis compared to CH4. In addition, the measured adsorption capacity of C2H6 is much stronger than that of CH4. This indicates that C2H6 exhibits more affinity on the organic-rich shale. It is observed that the total organic carbon (TOC) content correlates linearly with the gas adsorption capacities. In comparison to the TOC content, the BET surface area shows less effect on adsorption capacity. In addition, we found that the D-A model shows the most accuracy among the four

popular adsorption models in describing CH4 and C2H6 adsorption. However, Langmuir adsorption is not suitable in reproducing the adsorption of heavier hydrocarbons, i.e., C2H6 © 2020 American Chemical Society.
Number of references: 31
Main heading: Organic carbon
Controlled terms: Gas adsorption - Hydrocarbons
Uncontrolled terms: Adsorption capacities - Adsorption/desorption - Brunauer emmett tellers - Dubinin-Radushkevich - Gas adsorption capacity - Maximum operating pressures - Organic-rich shales - Total Organic Carbon
Classification code: 802.3 Chemical Operations - 804.1 Organic Compounds
Numerical data indexing: Pressure 3.00e+06Pa, Pressure 5.00e+06Pa, Temperature 3.13e+02K to 3.33e+02K
DOI: 10.1021/acs.energyfuels.0c00643
Funding Details: Number: YJSYZX19SKF0002, Acronym: -, Sponsor: -; Number: ZX20190399,ZX20190438, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: PLC20190804, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: 19JK0670, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2019JQ-808, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: The authors acknowledge the financial support by the Open Foundation of Shaanxi Key Laboratory of Lacustrine Shale Gas Accumulation and Exploitation (Grant YJSYZX19SKF0002), the Natural Science Basic Research Program of Shaanxi (Grant 2019JQ-808), the Scientific Research Program funded by the Shaanxi Provincial Education Department (Grant 19JK0670), the Open Fund of the State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology, Grant PLC20190804), and the Youth Innovation Team of Shaanxi Universities to Dr. C. Wang. We also acknowledge the financial support by the China Postdoctoral Science Foundation (ZX20190438) and the Special Support for Post-doc Creative Funding in Shangdong Province (ZX20190399) to Dr. Y. Liu.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

85. A comparative study of different stabilizers for retrieving geoelectric structure based on a unified framework

Accession number: 20201308353234
Authors: Rao, Liting (1); Wu, Xin (2, 3, 4); Guo, Rui (5); Gao, Jianshen (1); Dang, Bo (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Key Laboratory of Mineral Resources, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing; 100029, China; (3) College of Earth and Planetary Sciences, University of Chinese Academy of Sciences, Beijing; 100049, China; (4) Institutions of Earth Science, Chinese Academy of Sciences, Beijing; 100029, China; (5) State Key Laboratory on Microwave and Digital Communications, Beijing National Research Center for Information Science and Technology (BNRist), Department of Electronic Engineering, Tsinghua University, Beijing; 100084, China
Corresponding author: Rao, Liting(ltrao@xsyu.edu.cn)
Source title: Journal of Applied Geophysics
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Volume: 175
Issue date: April 2020
Publication year: 2020
Article number: 104001
Language: English
ISSN: 09269851
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Quantitative inversions of electromagnetic sounding data typically implement regularization to overcome the ill-posedness and obtain the geoelectric models in accordance with the prior information. The prior information is included by introducing the corresponding stabilizing functional (or a stabilizer) as a penalty term in the objective functional. However, there are a variety of stabilizers that can be chosen and some of them share similar properties. The choice of the appropriate stabilizer is still a problem in practical application. Therefore, we develop a stabilizer decomposition (SD) method to provide a better understanding of how stabilizers differ from each other and enable inverse problems with different stabilizers to be solved in a unified framework. The SD method decomposes the stabilizer into a weight function and a kernel function. The kernel function represents the core of minimization of the specific stabilizer and determines the fundamental characteristic. The weight function imposes extra tuning effect. The

similarities and differences between different stabilizers can be explained from the perspective of the kernel function and weight function. Through the inversions of various geoelectric models, the performance of similar stabilizers under different inversion parameter settings are compared and analyzed in terms of accuracy, stability and structural characteristics. We further discuss the reasons for their distinctive performance based on the SD method. It is hoped that this study would enable a reasoned selection of the stabilizer and more flexible tests with different stabilizers for retrieving geoelectric structure. © 2020 Elsevier B.V.
Number of references: 41
Main heading: Inverse problems
Controlled terms: Geophysics
Uncontrolled terms: Electromagnetic soundings - Fundamental characteristics - Geoelectric structures - Inversion - Inversion parameters - Regularization - Stabilizing functionals - Structural characteristics
Classification code: 481.3 Geophysics
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Funding text: This work is supported by the National Natural Science Foundation of China (Grant No. 41804115 , Grant No. 51974250), the Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2018JQ4007 , Grant No. 2018JQ4008 , Grant No. 2018JQ5133), and the Natural Science Foundation of Shaanxi Provincial Department of Education (Grant No. 19JK0669).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

86. Improved reversible dehydrogenation performance of MgH2 by the synergistic effects of porous boron nitride and NbF5

Accession number: 20202208719596
Authors: Zhu, Lei (1, 2); Liao, Yanxin (1); Zhong, Yujie (3, 4); Cui, Jing (1); Wang, Desen (5); Wang, Kuikui (1, 4)
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Corresponding author: Wang, Kuikui(kkwang@qdu.edu.cn)
Source title: Journal of Energy Storage
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Volume: 29
Issue date: June 2020
Publication year: 2020
Article number: 101418
Language: English
E-ISSN: 2352152X
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In this work, porous boron nitride (pBN) and NbF5 were used to improve the hydrogen storage performance of magnesium hydride (MgH2), especially the reversibility and dehydrogenation kinetics. We also carried out a series of control experiments to optimize the sample preparation method and addition amount of pBN. Comparing with the pristine MgH2 system, the as-prepared MgH2/NbF5@pBN sample exhibits promoting dehydrogenation kinetics. And it rapidly began to release hydrogen from around 230 °C, which was 140 °C lower. Moreover, it took 10 min during all the dehydrogenation process. A series of phase and chemical state analyses was used to study the enhanced effects of NbF5@pBN on the reversible hydrogen storage performance of MgH2. And the study demonstrates pBN is an effective additive as confinement medium and catalysis of the surface dangling-bond for improving the reversible dehydrogenation of MgH2. NbF5 could also act as catalysts. Therefore, the prominently improved dehydrogenation performance of MgH2 should be ascribed to a synergistic effect of nanoconfinement and catalysis. © 2020 Elsevier Ltd
Number of references: 65
Main heading: Kinetics

Controlled terms: Dehydrogenation - Magnesium compounds - Hydrogen storage - Niobium compounds - Hydrides - Nitrides - Catalysis - Chemical analysis - Boron nitride - III-V semiconductors
Uncontrolled terms: Chemical state analysis - Control experiments - Dehydrogenation kinetics - Porous boron nitrides - Reversible dehydrogenation - Sample preparation methods - Storage performance - Surface dangling bonds
Classification code: 522 Gas Fuels - 631.1 Fluid Flow, General - 712.1 Semiconducting Materials - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 931 Classical Physics; Quantum Theory; Relativity
Numerical data indexing: Temperature 4.13e+02K, Temperature 5.03e+02K, Time 6.00e+02s
DOI: 10.1016/j.est.2020.101418
Funding Details: Number: 2016018, Acronym: -, Sponsor: -; Number: 2019GGX103048, Acronym: -, Sponsor: Key Technology Research and Development Program of Shandong; Number: 51801108, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2016M592138,2017M610409, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2017B030314010, Acronym: -, Sponsor: Guangdong Provincial Key Laboratory of Advanced Energy Storage Materials;
Funding text: The work is supported by the National Natural Science Fund of China (51801108), the Key Research and Development Program of Shandong Province (2019GGX103048), China Postdoctoral Science Foundation (2016M592138 , 2017M610409), Qingdao Postdoctoral Applied Research Project (2016018) and the Open Fund of the Guangdong Provincial Key Laboratory of Advance Energy Storage Materials are gratefully acknowledged (2017B030314010). The authors acknowledge the support from the World-Class Discipline Program and the Taishan Scholar's Advantageous and Distinctive Discipline Program of Shandong Province.The work is supported by the National Natural Science Fund of China (51801108), the Key Research and Development Program of Shandong Province (2019GGX103048), China Postdoctoral Science Foundation (2016M592138, 2017M610409), Qingdao Postdoctoral Applied Research Project (2016018) and the Open Fund of the Guangdong Provincial Key Laboratory of Advance Energy Storage Materials are gratefully acknowledged (2017B030314010). The authors acknowledge the support from the World-Class Discipline Program and the Taishan Scholar's Advantageous and Distinctive Discipline Program of Shandong Province.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

87. One-Pot Template-Free Cross-Linking Synthesis of SiOx–SnO2@C Hollow Spheres as a High Volumetric Capacity Anode for Lithium-Ion Batteries

Accession number: 20202308785927
Authors: Ren, Dazhong (1, 2, 3); Huang, Hai (1); Qi, Jiangao (1); Zheng, Peng (1, 4)
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Corresponding authors: Zheng, Peng(zhengpeng@sust.edu.cn); Zheng, Peng(zhengpeng@sust.edu.cn)
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Abbreviated source title: Energy Technol.
Volume: 8
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Publication year: 2020
Article number: 2000314
Language: English
ISSN: 21944288
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Document type: Journal article (JA)
Publisher: Wiley-VCH Verlag
Abstract: Porous SiOx anodes for Li-ion batteries with a high volumetric energy density are desired. Herein, carbon-coated SiOx–SnO2 hollow spheres are prepared by facile one-pot high-temperature annealing without using any template. During the process, SiOx is obtained through Sn reduction with the assistance of C. In the composite, the SiOx hollow spheres have a thin wall, the small SnO2 particles are uniformly imbedded in the sphere wall, and the SiOx–SnO2 hollow spheres are coated by cross-linked carbon. As an anode, the composite has a large volumetric

capacity (1339 mAh cm-3 at 0.1 A g-1), a high gravimetric capacity (1030 mAh g-1 at 0.1 A g-1), and a good cyclic stability (after 100 cycles, 90% capacity is retained compared with that of the second cycle at 0.5 A g-1). The high capacity and good cycle stability result from the superior structure of the composite. Furthermore, the thin wall of the sphere can timely release a large expanded volume during lithiation, and the conformal carbon also provides a framework to maintain the structural integrity and facilitate the formation of a stable solid–electrolyte interface. © 2020 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim
Number of references: 45
Main heading: Anodes
Controlled terms: Spheres - Lithium-ion batteries - Silicon - Silicon compounds - Carbon - Solid electrolytes - Thin walled structures
Uncontrolled terms: Cycle stability - Cyclic stability - Electrolyte interfaces - Gravimetric capacity - High-temperature annealing - One-pot template - Volumetric capacity - Volumetric energy densities
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 714.1 Electron Tubes - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
Numerical data indexing: Percentage 9.00e+01%
DOI: 10.1002/ente.202000314
Funding Details: Number: 2019KJXX#054, Acronym: -, Sponsor: -; Number: -, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: PLC20190502, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: KF2019#1, Acronym: CRECU, MLR, Sponsor: Key Laboratory of Coal Resources Exploration and Comprehensive Utilization, Ministry of Land and Resources; Number: KFJJ#XB#2019#5, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: The authors acknowledge the financial support from Open Fund of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology) (No.: PLC20190502), Open Fund of Key Laboratory of Coal Resources Exploration and Comprehensive Utilization (Ministry of Land and Resources) (No.: KF20191), Young science and Technology Talents Foundation of Shaanxi province (No.: 2019KJXX054), and Engineering Research Center of Development and Management for Low to UltraLow Permeability Oil & Gas Reservoirs in West China (Ministry of Education; Xi'an Shiyou University) (No.: KFJJXB20195).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

88. Applying isotopic geochemical proxy for gas content prediction of Longmaxi shale in the Sichuan Basin, China

Accession number: 20201108279786
Authors: Chen, Zhipeng (1, 2); Chen, Lei (3); Wang, Gaocheng (4); Zou, Chen (4); Jiang, Shu (5); Si, Zhiwei (6); Gao, Wei (7)
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Abstract: Numerous studies have been conducted on the isotopic geochemical characteristics of shale gas. However, a systematic study of the relationship between the isotopic geochemical characteristics and gas content has not been addressed to date. In this study, we investigated the geochemical and isotopic compositions of shale gas samples, and the gas content of the Lower Silurian Longmaxi marine shale in the Huangjinba area, southern Sichuan Basin,

China. In addition, we analyzed the quantitative relationship between the geochemical parameters and the gas content. The Longmaxi shale gas is a dry gas with a low wetness (0.12%–0.67%), dominated by methane (89.49%–99.00%) with a small amount of ethane (0.11%–0.61%). The average values of #13Cmethane, #13Cethane and #13Cpropane are -29.8‰, -35.0‰, and -33.2‰, characterized by a partial isotopic reversal (#13Cmethane > #13Cpropane > #13Cethane) with a maturity level (Ro ≈ 2.30%–2.51%). The total gas content of the Longmaxi shale varies widely from 0.42 m3/t to 3.88 m3/t. Correlation analyses revealed that the ethane isotope (#13Cethane) and the magnitude of isotopic reversal (#13Cmethane - #13Cethane) exhibit strong correlations with the total gas content and the free gas content. This study demonstrates that carbon isotopic reversal of shale gas largely depends on the secondary cracking, and thermal maturity and residual liquid hydrocarbons content are important factors affecting the magnitude of carbon isotopic reversal. Based on the quantitative study conducted in this paper, we provide a new proxy for predicting the gas content of high maturity shale using an isotopic method. © 2020 Elsevier Ltd
Number of references: 53
Main heading: Carbon
Controlled terms: Ethane - Geochemistry - Shale gas - Gases - Isotopes
Uncontrolled terms: Correlation analysis - Gas content - Geochemical characteristic - Geochemical parameters - High thermal - Isotopic composition - Magnitude of carbon isotopic reversal - Sichuan Basin
Classification code: 481.2 Geochemistry - 512.2 Natural Gas Deposits - 522 Gas Fuels - 804 Chemical Products Generally - 804.1 Organic Compounds
DOI: 10.1016/j.marpetgeo.2020.104329
Funding Details: Number: 2017ZX05005-002-004, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: 41772121, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by a National Science and Technology Major Project of China (No. 2017ZX05005-002-004), the National Natural Science Foundation of China (No. 41630312), and the National Natural Science Foundation of China (No. 41772121). We also thank the Department of Geology, Northwest University , China for their financial support of the 1st author. We thank the PetroChina Zhejiang Oilfield Company for providing the shale gas samples for this study.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

89. Quantitative Evaluation of the Plugging Effect of the Gel Particle System Flooding Agent Using NMR Technique

Accession number: 20202208758275
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Language: English
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CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Gel particle profile modification and flooding is one of the main technical methods for stabilizing oil, water control, and production cycle prolonging in the oil field. Quantitative evaluation of the plugging effect of the displacement agent on pores of different sizes under various conditions may provide useful guidance for field

development. In this study, nuclear magnetic resonance technology and dynamic physical simulation experiments were used to quantitatively evaluate the plugging effect of pore spaces at different scales. The influence of permeability, temperature, injection pressure, injection volume, and formation water salinity on plugging effect was also investigated. The results show that the poly(ethylene glycol) (PEG)-1 gel particle system flooding agent can effectively plug pore spaces at different scales. For artificial cores, the plugging dimension was between 0.10 and 59.95 ms, and for natural cores, the plugging dimension was between 0.10 and 1144.64 ms. The plugging effect of gel particles was negatively correlated with permeability and salinity of formation water and positively correlated with temperature, injection pressure, and injection volume. Moreover, the plugging efficiency of gel particles for larger pores (>10.0 ms) was always better than that for smaller pores (0.10-10.0 ms). © 2020 American Chemical Society.
Number of references: 44
Main heading: Nuclear magnetic resonance
Controlled terms: Pressure effects - Polyethylene glycols - Floods - Produced Water
Uncontrolled terms: Displacement agents - Field development - Formation-water salinity - Injection pressures - Nuclear magnetic resonance technology - Physical simulation experiment - Production cycle - Quantitative evaluation
Classification code: 452.3 Industrial Wastes - 815.1.1 Organic Polymers - 931.1 Mechanics
Numerical data indexing: Time 1.00e-04s to 1.00e-02s, Time 1.00e-04s to 1.14e+00s, Time 1.00e-04s to 6.00e-02s
DOI: 10.1021/acs.energyfuels.0c00155
Funding Details: Number: 2019JQ-525, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2018JM5017,2019JQ-527, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

90. PH-Responsive dopamine-based nanoparticles assembled: Via Schiff base bonds for synergistic anticancer therapy

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Publisher: Royal Society of Chemistry
Abstract: The dynamic Schiff base bond is exploited to construct monodisperse dopamine-based nanoparticles with autofluorescence and pH-sensitivity. This allows facile monitoring and pH-responsive drug release in the acidic tumor microenvironment. Anticancer drugs doxorubicin and a photosensitizer chlorin e6 are further loaded into the nanoparticles and synergistic anticancer efficacy is achieved. This journal is © The Royal Society of Chemistry.
Number of references: 22

Main heading: Nanoparticles
Controlled terms: Amines - Drug delivery - Photosensitizers - Neurophysiology
Uncontrolled terms: Anti-cancer therapies - Anticancer drug - Autofluorescence - Drug release - Mono-disperse - PH sensitivity - PH-responsive - Tumor microenvironment
Classification code: 461.6 Medicine and Pharmacology - 741.1 Light/Optics - 761 Nanotechnology - 804.1 Organic Compounds - 933 Solid State Physics
DOI: 10.1039/d0cc04656f
Funding Details: Number: 20190605, Acronym: -, Sponsor: -; Number: 21703169,21872151, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: 2020036, Acronym: YIPA CAS, Sponsor: Youth Innovation Promotion Association of the Chinese Academy of Sciences;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

91. A dual-porous and dual-permeable media model for imbibition in tight sandstone reservoirs

Accession number: 20202708883721
Authors: Shun, Liu (1); Jun, Ni (2); Xianli, Wen (3); Xiong, Liu (1); Zhaoqin, Huang (4); Desheng, Zhou (1); Pengju, Ren (5)
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Article number: 107477
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Tight sandstone is an important oil reservoir in China which development is required water flooding. During water flooding treatments, imbibition is proven to strongly affect oil displacement. In this paper, capillary pressure is found not to be the only driving force to control imbibition in tight sandstone rock. Imbibition index is defined to be the second driving force. An experiment was designed to prove the imbibition index when water contacted tight sandstone samples. Then, a dual-porosity and dual-permeability numerical model was developed to simulate imbibition effect during water flooding in tight sandstone formations. Experimental results indicated that imbibition caused the weight of samples increased first and then declined. Increase is controlled by capillary force, and decline is affected by imbibition index. In Changqing formation in China, the imbibition index is 0.17–0.24, and the average imbibition index is 0.21. © 2020 Elsevier B.V.
Number of references: 34
Main heading: Porosity
Controlled terms: Floods - Numerical models - Petroleum reservoir engineering - Tight gas - Petroleum reservoirs - Reservoirs (water) - Oil well flooding - Sandstone
Uncontrolled terms: Capillary force - Driving forces - Dual-permeability - Oil displacement - Oil reservoirs - Permeable media - Tight sandstone reservoirs - Tight sandstones

Classification code: 441.2 Reservoirs - 482.2 Minerals - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1016/j.petrol.2020.107477
Funding Details: Number: 51604225,51804257,51874242, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2016D-5007-0207, Acronym: -, Sponsor: PetroChina Innovation Foundation; Number: 2016ZX05050-009, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
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Database: Compendex
Data Provider: Engineering Village

92. Artificial neural network–based time-domain interwell tracer testing for ultralow-permeability fractured reservoirs

Accession number: 20202808917191
Authors: Jing, Cheng (1, 2); Dong, Xiaowei (3); Cui, Wenhao (4, 5); Dong, Zhenzhen (1, 2); Ren, Long (1, 2); Gu, Xiaoyu (1, 2); He, Yanlong (1, 2); Pu, Chunsheng (6); Liu, Xiaoyu (7)
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Article number: 107558
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Abstract: Affected by water injection, the interwell parameters of injection-production wells in ultralow-permeability fractured reservoirs are changed in the time domain, and interwell tracer testing can characterize interwell characteristics quantitatively. For an oil field in the middle and late stages of development, the number of interwell tracers is reduced to control costs, meaning that some injection-production well groups cannot be monitored effectively. Given the rapid development of artificial intelligence technology by which the complex implicit relationship of parameters can be obtained through sample learning, it is possible that future interwell parameters can be predicted by combining a large accumulation of data from interwell tracer testing of well groups with historical production data. This work took a shallow, ultralow-permeability, fractured reservoir in the eastern part of the Ordos basin as its object, and based on the interpreted parameters of previous interwell tracer tests, combined with the dynamic production data and static geological parameters, an analysis method of time-domain interwell tracer testing was developed for ultralow-permeability fractured reservoirs using an artificial neural network. Learning from actual field samples and analyzing two schemes of neural network structure, the minimum error was found for the scheme that predicted the next interwell parameter based on the interpreted parameters of the last time the tracer reached the minimum, with a relative error of 1.94%. The proposed method can predict future interwell parameters reliably and can provide a new low-cost monitoring method for the middle and late stages of water injection development in ultralow-permeability fractured reservoirs. © 2020
Number of references: 35
Main heading: Time domain analysis
Controlled terms: Fracture - Petroleum reservoir engineering - Low permeability reservoirs - Well testing - Neural networks - Oil field development

Uncontrolled terms: Artificial intelligence technologies - Dynamic production - Fractured reservoir - Geological parameters - Historical production - Implicit relationships - Interwell tracer testing - Neural network structures
Classification code: 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 921 Mathematics - 951 Materials Science
Numerical data indexing: Percentage 1.94e+00%
DOI: 10.1016/j.petrol.2020.107558
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Funding text: This research was supported by the National Natural Science Foundation of China (No. 51804256 ; No. 51704235), Natural Science Basic Research Plan in Shaanxi Province of China (No. 2019JQ287 ; No. 2018JQ5208), and Young Talent fund of University Association for Science and Technology in Shaanxi , China (No. 20180417).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

93. Local buckling failure analysis of high strength pipelines containing a plain dent under bending moment

Accession number: 20201308337452
Authors: Shuai, Yi (1); Zhou, Dao-Chuan (2); Wang, Xin-Hua (1); Yin, Heng-Gang (3); Zhu, Shidong (4); Li, Ji (5); Cheng, Y. Frank (6)
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Issue date: May 2020
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Article number: 103266
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: This work investigated the local buckling failure of high-strength and large-diameter pipelines containing a dent under bending moment. An improved three-dimensional numerical model was developed by considering the multiple nonlinearities of pipe geometry, material and the boundary conditions. The effect of yield strength and strain hardening parameters of pipeline steel on the critical buckling load at the dent was analyzed in detail. The results show that, the critical buckling moment of the pipeline decreases with the increase of n. However, when the internal pressure is low, the influence of internal pressure on the critical buckling moment is limited, and the hardening exponent affects the critical buckling moment only when n © 2020 Elsevier B.V.
Number of references: 36
Main heading: Buckling
Controlled terms: Yield stress - Bending moments - Pipelines - Strain hardening - Sensitivity analysis
Uncontrolled terms: Bending moment resistance - Critical bending moment - Critical buckling loads - Dent - Modelling studies - Multiple nonlinearities - Strain-hardening exponent - Three-dimensional numerical modeling
Classification code: 408.2 Structural Members and Shapes - 537.1 Heat Treatment Processes - 619.1 Pipe, Piping and Pipelines - 921 Mathematics - 951 Materials Science
DOI: 10.1016/j.jngse.2020.103266
Funding Details: Number: 2019zz-21, Acronym: -, Sponsor: -; Number: 18JH0005, Acronym: -, Sponsor: Beijing Municipal Commission of Education; Number: -, Acronym: -, Sponsor: Beijing Municipal Education Commission; Number: -, Acronym: -, Sponsor: Beijing Municipal Natural Science Foundation; Number: 2017YFC0805000 / 2017YFC0805005, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

94. Ta@Ag Porous Array with High Stability and Biocompatibility for SERS Sensing of Bacteria

Accession number: 20202108688112
Authors: Chen, Dongzhen (1, 2); Ning, Pan (3); Zhang, Yu (4); Jing, Jinyu (2); Zhang, Meng (5); Zhang, Liang (1); Huang, Jian (6); He, Xinhai (1); Fu, Tao (3); Song, Zhongxiao (2); He, Guangyu (7); Qian, Dan (2); Zhu, Xiaodong (2)
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Abbreviated source title: ACS Appl. Mater. Interfaces
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Language: English
ISSN: 19448244
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Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: The reliable sensing of bacteria by surface-enhanced Raman scattering (SERS) technology necessitates a rational design of a substrate with high sensitivity, stability, and minimal invasion. Hence, a bimetallic Ta@Ag film with a porous array is developed by the magnetron sputtering technique and the structure could be controlled by a Ta dopant. A porous array connected by ligaments with compact granular nanoprotrusions is a fascinating substrate for SERS sensing. It makes steady SERS signals even in harsh chemical environments due to its high structural and chemical stability. The configuration of binary Ta@Ag has higher surface free energy than that of pure Ag, and the strong bactericidal activity of Ag is suppressed efficiently. Using E. coli as a model pathogen, the Ta@Ag porous film could maintain the long-term survival rate of E. coli up to 95% and a limit of SERS detection of E. coli down to 102 CFU/mL, which is measured by the standard colony-counting method. In sum, this work provides a promising strategy to fabricate a corrosion-resistant and biocompatible bimetallic Ta@Ag film with a porous array for the SERS sensing of microbial cells. Copyright © 2020 American Chemical Society.
Number of references: 35
Main heading: Escherichia coli

Controlled terms: Substrates - Chemical stability - Free energy - Surface scattering - Raman scattering - Biocompatibility - Corrosion resistance
Uncontrolled terms: Bactericidal activity - Chemical environment - Corrosion-resistant - High sensitivity - Nanoprotrusions - Rational design - Surface enhanced Raman Scattering (SERS) - Surface free energy
Classification code: 461.9.1 Immunology - 539.1 Metals Corrosion - 641.1 Thermodynamics - 741.1 Light/Optics - 801 Chemistry - 931 Classical Physics; Quantum Theory; Relativity
Numerical data indexing: Percentage 9.50e+01%
DOI: 10.1021/acsami.0c03630
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Compendex references: YES
Database: Compendex
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95. A novel method to evaluate cleaning quality of oil in shale using pyrolysis pyrogram (*Open Access*)

Accession number: 20200508108741
Authors: Dong, Xu (1); Shen, Luyi (2); Zhao, Jianpeng (3); Liu, Xuefeng (4); Sun, Yuli (1); Golsanami, Naser (5); Wang, Fei (1, 6); Bi, Haisheng (6); Zitha, Pacelli (1, 7)
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Abstract: Complete and thorough core cleaning is a critical prerequisite for the precise measurements of most rock's petrophysical parameters. In shale, the oil cleaning process, aimed to remove the volatile hydrocarbons, is often complicated by the requirement for intact solid organic. Evaluation of shale's cleaning methods needs to take structural integrity of organic matrix into account but neglected in the existing researches. Here, we develop a novel evaluation method using a modified ESH (extended slow heating) pyrolysis cycle, which starts at a lower initial temperature of 150°C for 10 minutes and then slowly increases to 650°C by 10°C/min. Hydrocarbons on the ESH pyrogram were divided into light free hydrocarbon (SA), FHR (fluid-like hydrocarbon, SB), and solid organic matter (SC). We propose a set of quantitative evaluation criterions comparing the results of pyrograms, for different types of the hydrocarbons, at different cleaning conditions. We showed that a modified pyrogram achieves complete cleaning with SA and SB removed while SC remains almost intact. The modified pyrogram achieves complete removal of FHR in the second stage of pyrogram, while earlier researches often report residual FHR. The introduced method improves the accuracy in the identification of production potential in kerogen-rich shale reservoirs up to about 3% of the total pore volume. Further, the new approach allows a quantitative assessment for the cleaning quality without altering the sample's

organic matrix. Future studies on the petrophysical properties of the hydrocarbon-bearing reservoir rocks may benefit from the thorough hydrocarbon removal achieved through the modified pyrogram methods proposed in this study. © 2020 The Authors. Energy Science & Engineering published by the Society of Chemical Industry and John Wiley & Sons Ltd.
Number of references: 44
Main heading: Pyrolysis
Controlled terms: Petroleum prospecting - Oil shale - Hydrocarbons - Kerogen - Oil bearing formations - Quality control
Uncontrolled terms: Hydrocarbon-bearing reservoirs - Initial temperatures - Petrophysical parameters - Petrophysical properties - Quantitative assessments - Quantitative evaluation - Solid organic matter - Volatile hydrocarbons
Classification code: 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 802.2 Chemical Reactions - 804.1 Organic Compounds - 913.3 Quality Assurance and Control
Numerical data indexing: Percentage 3.00e+00%, Temperature 4.23e+02K, Temperature 9.23e+02K
DOI: 10.1002/ese3.625
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96. Bonding similarities and differences between Y-Sb-Te and Sc-Sb-Te phase-change memory materials (*Open Access*)

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Authors: Zhou, Yuxing (1); Sun, Liang (2); Zewdie, Getasew M. (1); Mazzarello, Riccardo (3); Deringer, Volker L. (4); Ma, Evan (5); Zhang, Wei (1, 6)
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Language: English
ISSN: 20507534
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CODEN: JMCCCX
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: The scandium (Sc)-alloyed Sb2Te3 phase-change alloy has recently been found to enable ultrafast crystal nucleation due to the formation of Sc-stabilized octahedral motifs in the amorphous phase, rendering cache-type phase-change memory feasible. When yttrium (Y) is added, however, non-octahedral bonding patterns form in the amorphous Sb2Te3-based network even though Y has a valence electron configuration similar to that of Sc and also forms perfect octahedral bonding environments with tellurium in the YTe crystal. Here we elucidate the origin of this difference between Sc and Y, by carrying out thorough ab initio simulations and orbital-based bonding analyses on amorphous Y-Sb-Te and Sc-Sb-Te compounds. We also demonstrate how the smooth overlap of atomic positions (SOAP) similarity kernel can be used to quantify the structural similarity of local motifs in the amorphous phase with

respect to various crystalline yttrium and scandium tellurides, both in the nearest-neighbor shell and beyond. We find that the bonding contrast of Y- and Sc-centered structural motifs in amorphous Sb2Te3 stems from their parent crystals at high Te concentrations. The larger atomic radius of Y and the weaker charge transfer when bonded with Te is found to allow more Te neighbors and cause a more open bonding environment, leading to higher coordination numbers and non-octahedral environments. We discuss the implications of the different local environments for practical applications in memory devices. © 2020 The Royal Society of Chemistry.
Number of references: 95
Main heading: Charge transfer
Controlled terms: Crystals - Phase change memory - Scandium - Crystal atomic structure - Phase change materials - Scandium alloys - Antimony compounds - Tellurium compounds - Scandium compounds
Uncontrolled terms: Ab initio simulations - Bonding environment - Coordination number - Crystal nucleation - Local environments - Octahedral environment - Structural motifs - Structural similarity
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 722.1 Data Storage, Equipment and Techniques - 802.2 Chemical Reactions - 931.3 Atomic and Molecular Physics - 933.1 Crystalline Solids - 933.1.1 Crystal Lattice
DOI: 10.1039/d0tc00096e
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Funding text: W. Z. thanks the support of National Natural Science Foundation of China (61774123), 111 Project 2.0 (BP2018008) and the Science and Technology Department of Jiangsu Province (BK20170414). V. L. D. acknowledges a Leverhulme Early Career Fellowship and support from the Isaac Newton Trust. R. M. acknowledges funding from Deutsche Forschungsgemeinschaft (DFG) within SFB 917 (''Nanoswitches''). E. M. is supported at JHU by U.S. Department of Energy (DOE) DOE-BES-DMSE under grant DE-FG02-19ER46056. The authors acknowledge the computational resources provided by the HPC platform of Xi'an Jiaotong University and JARA-HPC from RWTH Aachen University under project JARA0176. The authors also acknowledge the support by the Materials Studio for Neuro-inspired Computing (mSonic) and the International Joint Laboratory for Micro/Nano Manufacturing and Measurement Technologies of Xi'an Jiaotong University.
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97. Effect of temperature and confining pressure on the evolution of hydraulic and heat transfer properties of geothermal fracture in granite

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CODEN: APENDX

Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The hydraulic and heat transfer properties of artificial fracture networks are key to the efficiency of energy production from geothermal reservoirs. To date, no conclusive view exists of the evolution in fracture permeability and heat transfer coefficient when arbitrary stresses and temperatures are applied. This work examines the evolution of hydraulic and heat transfer properties during simulated geothermal energy extraction using a novel fluid flow-through test device accommodating large single artificial fractures in granite. Experiments are conducted in two contrasting modalities: at constant temperature with increasing confining pressures, and at constant confining pressure with increasing temperature. At constant temperature, as the confining pressure increases from 4 to 20 MPa, both hydraulic and heat transfer properties decrease, with permeability decreases by 46–63% and heat transfer coefficient decreases by 13–67%. Permeability decreases by 28–37% as temperature increases at constant confining pressure larger than 10 MPa, but permeability may first decrease and then increase at low constant confining pressure of 5 MPa. As the temperature increases from 100 to 200 °C at constant confining pressures, heat transfer coefficient increases by 25–45%. Results show that confining pressure impacts hydraulic properties more strongly than heat transfer properties, while reservoir temperature affects the heat transfer properties more strongly than hydraulic properties. These new findings on the evolution of permeability and heat transfer rate for different paths of temperature and confining pressure are critically important to the understanding of heat production from real geothermal reservoirs. © 2020 Elsevier Ltd
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Main heading: Granite
Controlled terms: Flow of fluids - Heat transfer coefficients - Temperature - Fracture - Geothermal fields - Petroleum reservoir engineering
Uncontrolled terms: Constant temperature - Effect of temperature - Fracture permeability - Geothermal reservoir - Heat transfer properties - Increasing temperatures - Reservoir temperatures - Temperature increase
Classification code: 481.3.1 Geothermal Phenomena - 512.1.2 Petroleum Deposits : Development Operations - 615.1 Geothermal Energy - 631.1 Fluid Flow, General - 641.1 Thermodynamics - 641.2 Heat Transfer - 951 Materials Science
Numerical data indexing: Pressure 1.00e+07Pa, Pressure 4.00e+06Pa to 2.00e+07Pa, Pressure 5.00e+06Pa, Temperature 3.73e+02K to 4.73e+02K
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Compendex references: YES
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98. Effect of organic maturity on shale gas genesis and pores development: A case study on marine shale in the upper Yangtze region, South China (*Open Access*)

Accession number: 20210209740466
Authors: Zhang, Kun (1, 2, 3); Peng, Jun (1); Wang, Xin (4, 5); Jiang, Zhenxue (4, 5); Song, Yan (4, 5, 6); Jiang, Lin (6); Jiang, Shu (7, 8, 9); Xue, Zixin (4, 5); Wen, Ming (4, 5); Li, Xiaohui (4, 5); Liu, Xiaoxue (4, 5); Huang, Yizhou (10); Wang, Pengfei (11); Shan, Chang'an (12); Liu, Tianlin (4); Xie, Xuelian (13)
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Publisher: De Gruyter Open Ltd
Abstract: The marine shale in southern China has undergone complex tectonic evolution with a high thermal evolution degree. Excessive thermal evolution brings certain risks to shale gas exploration and development. With the advancement of experimental methods, the evolution process of shale reservoirs can be better understood from the micro-nanoscale. This work takes the Ordovician-Silurian Wufeng and the first member of Longmaxi Formation in the Sichuan Basin and Lower Cambrian Niutitang Formation in Outer Margin of the Sichuan Basin to study the impact of maturity upon the genesis of shale gas and development features of the reservoir. A series of geochemical research methods, including TOC, gas component and gas isotope, were adopted to study the impact of different thermal evolution stages of organic matter upon the genesis of shale gas. The nanoscale micro-imaging technique, such as FIB-SEM and FIB-HIM, was used to analyze the development of OM-hosted pores. As shown from the results, when R o = 1.2-3.5%, the marine shale gas is dominated by methane and other hydrocarbon gases, since the mixture of cracking gas from liquid hydrocarbons and kerogen-cracking gas cause the carbon isotope reversal. Besides, the pyrobitumen pores characterized by the strong connectivity and storage capacity were primarily developed. When R o > 3.5%, the organic matter is at the graphitization stage. The shale gas is mainly composed of nitrogen at this stage. The nitrogen is originated from the atmosphere and the thermal evolution process, and the OM-hosted pores (pyrobitumen and kerogen pores) characterized by the bad connectivity and storage capacity are developed. Finally, the main component of shale gas, the genesis of shale gas and the pattern of OM-hosted pores under different thermal evolution stages of organic matter are summarized, which provide technical support for the exploration and development of shale gas. © 2020 Kun Zhang et al., published by De Gruyter 2020.
Number of references: 57
Main heading: Kerogen
Controlled terms: Petroleum prospecting - Gases - Nitrogen - Nanotechnology - Biogeochemistry - Carbon - Shale gas - Hydrocarbons - Isotopes
Uncontrolled terms: Evolution process - Experimental methods - Exploration and development - Geochemical research - Liquid hydrocarbons - Strong connectivity - Technical support - Tectonic evolution
Classification code: 481.2 Geochemistry - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 761 Nanotechnology - 801.2 Biochemistry - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Percentage 1.20e+00% to 3.50e+00%, Percentage 3.50e+00%
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99. Isotherms, thermodynamics and kinetics of methane-shale adsorption pair under supercritical condition: Implications for understanding the nature of shale gas adsorption process

Accession number: 20194407596514
Authors: Dang, Wei (1, 2, 3); Zhang, Jinchuan (4); Nie, Haikuan (5); Wang, Fengqin (1, 2); Tang, Xuan (4); Wu, Nan (6); Chen, Qian (5); Wei, Xiaoliang (4); Wang, Ruijing (2)
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Publisher: Elsevier B.V., Netherlands
Abstract: This research article selects supercritical methane and organic-rich shale as adsorbate-adsorbent pair to investigate methane adsorption behavior and enrich our understanding of the nature of shale gas adsorption process. The isotherms and kinetics of methane-shale adsorption pair are measured at temperatures of 303 K, 323 K, 343 K and 363 K by using a volumetric experimental setup. Then, the Langmuir-based (Langmuir, Langmuir + k, Langmuir + Henry), BET-based (BET, BET + k, BET + Henry) and DA-based (DA, DA + k and DA + Henry) excess models are used to interpret measured excess isotherms, and the Unipore Diffusion (UD), Bidisperse Diffusion (BD) and Two Combined First-Order Rate (TCFOR) models are used to interpret the adsorption kinetics data. Instead of using the coefficient of determination (R2), this work used the corrected Akaike's Information Criterion (AICc) for model selection. It is found that the DA + Henry model is more suitable for excess adsorption isotherms, and the TCFOR model is more appropriate for adsorption kinetics study. Additionally, for methane-shale adsorption under supercritical condition, the fugacity is of great significance in evaluating thermodynamic properties including isosteric heat of adsorption (qst), enthalpy change (#H), entropy change (#S) and Gibbs free energy change (#G). These properties show strong dependence on adsorption amount and temperature, and suggest that supercritical methane adsorption on organic-rich shale is a process of physisorption, exothermic and spontaneous. Further, the kinetics parameters extracted from kinetics curves suggest that the methane adsorption at each pressure step is a two-stage process, with a fast macropore diffusion process at early time, followed by a slow micropore diffusion process at later time. Additionally, the fast macropore diffusion dominates the two-stage adsorption process at lower pressures, while at higher pressures slow micropore diffusion dominates. © 2019 Elsevier B.V.
Number of references: 67
Main heading: Gas adsorption
Controlled terms: Diffusion - Free energy - Physisorption - Microporosity - Gibbs free energy - Shale gas - Kinetics - Methane
Uncontrolled terms: Akaike's information criterions - Coefficient of determination - Excess adsorption isotherms - Excess isotherm - Gibbs free energy changes - Isosteric heat of adsorption - Methane adsorption - Thermodynamics and kinetics
Classification code: 512.2 Natural Gas Deposits - 522 Gas Fuels - 631.1 Fluid Flow, General - 641.1 Thermodynamics - 802.3 Chemical Operations - 804.1 Organic Compounds - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Temperature 3.03e+02K, Temperature 3.23e+02K, Temperature 3.43e+02K, Temperature 3.63e+02K
DOI: 10.1016/j.cej.2019.123191
Funding Details: Number: 2017ZX05039-001,2019QNKYCXTD05,TPR-2019-01, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: 2019JQ-367, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This study was supported by Natural Science Basic Research Plan in Shaanxi Province of China (2019JQ-367), the Open Funding of Key Laboratory of Tectonics and Petroleum Resources, Ministry of Education , China (TPR-2019-01), Research on the geological factors controlling lacustrine shale gas reservoir formation and sweet spot prediction (2017ZX05039-001), and Research on Clastic Sedimentology and Reservoir Evaluation (2019QNKYCXTD05).

Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

100. A new resolution enhancement method for sandstone thin-section images using perceptual GAN

Accession number: 20203909238978
Authors: Liu, Ye (1, 3); Guo, Chao (2); Cao, Jie (1); Cheng, Zhong (4); Ding, Xiangxiang (4); Lv, Lintao (1); Li, Fan (1); Gong, Meichen (1)
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Publication year: 2020
Article number: 107921
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The thin section is a sliver cut of rock sample and photographed by a microscope to help researchers investigate the mineral, structure, and geology details of a rock sample. For the purpose of photographing using the microsctope, only a small portion of the thin section can be visualized. The results, however, can hardly satisfy the requirement of a high resolution and larger scale visualization. The thin section is then trapped into a dilemma of contradiction between resolution and field of view. To solve this problem, we propose the Generative Adversarial NetworksGAN based architectures representing the perceptual SR in this paper. Four perceptual super-resolution methods and two pixel-wise super-resolution methods are trained and tested for comparison with the dataset of sandstone thin-section. The perceptual GAN based super-resolution method is demonstrated to compensate for this limitation by enhancing the resolution of a large field of view image, which will provide a higher resolution detail recovery and larger field of view simultaneously. Based on the digital experiment analysis and comparison, thin-section perceptual loss with Residual-in-Residual Dense Block (RRDB) and Relativistic average GANs (RaGAN) shows a more realistic texture and evident edge for minerals and pores than other methods. With the new perceptual GAN based image enhancement method, the petroleum geologist can significantly improve the accuracy and reliability of all their thin section based research quality. © 2020
Number of references: 22
Main heading: Generative adversarial networks
Controlled terms: Sandstone - Image enhancement - Textures - Minerals - Optical resolving power
Uncontrolled terms: Adversarial networks - Experiment analysis - Higher resolution - Large field of views - Petroleum geologists - Research quality - Resolution enhancement - Superresolution methods
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Compendex references: YES
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101. Immobilized angiotensin II type I receptor: A powerful method of high throughput screening for antihypertensive compound identification through binding interaction analysis

Accession number: 20201108291962
Authors: Liang, Qi (1, 2); Fu, Xiaoying (1); Zhang, Jianfeng (3); Hao, Jiaxue (1); Feng, Gangjun (1); Wang, Jing (1); Li, Qian (1); Ahmad, Faizan (1); Zhao, Xinfeng (1)
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Corresponding author: Zhao, Xinfeng(zhaoxf@nwu.edu.cn)
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Article number: 461003
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CODEN: JCRAEY
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Publisher: Elsevier B.V., Netherlands
Abstract: The enormous growth in drug discovery paradigm has necessitated continuous exploration of new methods for drug-protein interaction analysis. To enhance the role of these methodologies in designing rational drugs, this work extended an immobilized angiotensin II type I receptor (AT1R) based affinity chromatography in antihypertensive compound identification. We fused haloalkane dehalogenase at C-terminus of AT1R and expressed the fusion receptor in E. coli. The expressed receptor was covalently immobilized onto 8.0 μm microspheres by mixing the cell lysate with 6-chlorocaproic acid-modified amino polystyrene microspheres. The immobilized AT1R was utilized for thermodynamic and kinetic interaction analysis between the receptor and four specific ligands. Following confirmation of these interactions by molecular docking, we identified puerarin and rosmarinic acid by determining their binding to the receptor. Azilsartan, candesartan, valsartan and olmesartan displayed two kinds of binding sites to AT1R by injection amount-dependent method. By molecular docking, we recognize the driving forces of the interaction as electrostatic interaction, hydrogen bonds and van der Waals force. The dissociation rate constants (kd) of azilsartan, candesartan, valsartan and olmesartan to AT1R were 0.01138 ± 0.003, 0.05142 ± 0.003, 0.07547 ± 0.004 and 0.01310 ± 0.005 min -1 by peak profiling assay. Comparing with these parameters, puerarin and rosmarinic acid presented lower affinity (KA: 0.12 × 104 and 1.5 × 104/M) and slower kinetics (kd: 0.6864 ± 0.03 and 0.3005 ± 0.01 min-1) to the receptor. These results, taking together, indicated that the immobilized AT1R has the capacity to probe antihypertensive compounds. © 2020 Elsevier B.V.
Number of references: 43
Main heading: Van der Waals forces
Controlled terms: Microspheres - Affinity chromatography - Molecular modeling - Binding energy - Binding sites - Proteins - Escherichia coli - Rate constants - Hydrogen bonds - Complexation - Dissociation
Uncontrolled terms: Amino polystyrene - Binding interaction - Continuous exploration - Dissociation rate constant - Drug-protein interactions - High throughput screening - Kinetic interactions - Molecular docking
Classification code: 801 Chemistry - 801.2 Biochemistry - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics
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102. Gradient stiffening induced interfacial cracking and strain tolerant design in thermal barrier coatings

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Authors: Wang, Li-Shuang (1); Wei, Zhi-Yuan (2); Cheng, Bo (2); Liu, Mei-Jun (2); Li, Guang-Rong (2); Dong, Hui (1); Yang, Guan-Jun (2)
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Abstract: Strain tolerant structures endow thermal barrier coatings (TBCs) with exceptional capability to bear various strains generated during service. However, the strain tolerance of TBCs inevitably degrades when stiffening occurs at high temperatures. Herein, we tailored a strain tolerant structure to resist degradation based on an understanding of the unique stiffening behavior and consequent failure mechanism of TBCs. The degree of gradient stiffening across the thickness of TBCs is caused by temperature-dependent sintering kinetics of ceramic coatings. As a result, vertical and in-plane cracks are formed in a scale-progressive way. Simulation results reveal that the differential degree of stiffening is a main cause of interfacial cracking. Subsequently, we proposed a strain tolerant structure that is tailored by lowering the stiffening rate of regions exposed to higher temperatures. Due to the weakened differential stiffening effect, the driving force that extends the interfacial cracks was significantly lowered. Thus, this strain tolerant TBC is expected to be able to resist degradation caused by sintering. These results will guide advanced design of TBCs for future applications. © 2019 Elsevier Ltd and Techna Group S.r.l.
Number of references: 58
Main heading: Thermal barrier coatings
Controlled terms: Strain - Sintering - Structural design - Failure (mechanical)
Uncontrolled terms: Differential degree - Failure mechanism - Future applications - Interfacial cracking - Interfacial cracks - Sintering kinetics - Temperature dependent - Thermal barrier coating (TBCs)
Classification code: 408.1 Structural Design, General - 951 Materials Science
DOI: 10.1016/j.ceramint.2019.09.226
Funding Details: Number: 51901181, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 201806285079, Acronym: CSC, Sponsor: China Scholarship Council; Number: JZX7Y20190262062001, Acronym: -, Sponsor: Domain Foundation of Equipment Advance Research of 13th Five-year Plan;
Funding text: This work was supported by the National Natural Science Foundation of China (grant number 51901181); the Domain Foundation of Equipment Advance Research of 13th Five-year Plan (grant number JZX7Y20190262062001). The financial support from China Scholarship Council to be a postdoctoral researcher in Forschungszentrum Jülich would be greatly appreciated by Dr. G.R. Li (grant number 201806285079).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

103. Porosity prediction based on GS+GA-XGBoost

Accession number: 20212510525560
Authors: Zheng, Zechen (1); Pan, Shaowei (1); Luo, Haining (2); Guo, Zhi (3)
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Source title: Proceedings - 2020 IEEE International Symposium on Parallel and Distributed Processing with Applications, 2020 IEEE International Conference on Big Data and Cloud Computing, 2020 IEEE International Symposium on Social Computing and Networking and 2020 IEEE International Conference on Sustainable Computing and Communications, ISPA-BDCloud-SocialCom-SustainCom 2020

Abbreviated source title: Proc. - IEEE Int. Symp. Parallel Distrib. Process. Appl., IEEE Int. Conf. Big Data Cloud Comput., IEEE Int. Symp. Soc. Comput. Netw. IEEE Int. Conf. Sustain. Comput. Commun., ISPA-BDCloud-SocialCom-SustainCom
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Issue title: Proceedings - 2020 IEEE International Symposium on Parallel and Distributed Processing with Applications, 2020 IEEE International Conference on Big Data and Cloud Computing, 2020 IEEE International Symposium on Social Computing and Networking and 2020 IEEE International Conference on Sustainable Computing and Communications, ISPA-BDCloud-SocialCom-SustainCom 2020
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Conference name: 18th IEEE International Symposium on Parallel and Distributed Processing with Applications, 10th IEEE International Conference on Big Data and Cloud Computing, 13th IEEE International Symposium on Social Computing and Networking and 10th IEEE International Conference on Sustainable Computing and Communications, ISPA-BDCloud-SocialCom-SustainCom 2020
Conference date: December 17, 2020 - December 19, 2020
Conference location: Virtual, Exeter, United kingdom
Conference code: 169340
Sponsor: IEEE; IEEE Computer Society; IEEE Technical Committee on Scalable Computing (TCSC)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at the subjectivity and poor environmental adaptability of traditional reservoir porosity prediction models, as well as the non-linear characteristics of reservoir parameters, the paper proposes a porosity prediction algorithm based on eXtreme Gradient Boosting (XGBoost). The hyperparameters of XGBoost are optimized by Grid_search(GS) and Genetic A lgorithm(GA), and then a highly accurate porosity prediction model is established based on the optimized parameters. By comparing with the MAE, MAPE and RMSE of the five models, it is found that the three performance indicators of the GS+GA-XGBoost model are 0.155880, 0.020500 and 0.527946, which are at least 4-6 times lower than the errors of the other five models. At the same time, the influence of multi-threaded on the XGBoost model is studied. The final experimental results show that on the test set, the prediction results of the GS+GA-XGBoost model are basically consistent with the original porosity, and 4 threads can improve the speed of model establishment and prediction. The model can effectively predict the porosity of the reservoirs in this area, and the model is very popular. © 2020 IEEE.
Number of references: 10
Main heading: Porosity
Controlled terms: Forecasting - Genetic algorithms
Uncontrolled terms: Environmental adaptability - Gradient boosting - Nonlinear characteristics - Optimized parameter - Performance indicators - Porosity predictions - Reservoir parameters - Reservoir porosity
Classification code: 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1109/ISPA-BDCloud-SocialCom-SustainCom51426.2020.00153
Funding Details: Number: 2019JM-174,2020JM-534, Acronym: -, Sponsor: -; Number: 18JS086, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: ACKNOWLEDGMENT This research was partly supported by the National Natural Science Foundation Projects of Shaanxi Provincial (2019JM-174, 2020JM-534), and Scientific Research Program Funded by Shaanxi Provincial Education Department (18JS086).
Compendex references: YES
Database: Compendex
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104. Dominant effects of 2D pores on mechanical behaviors of plasma sprayed ceramic coatings during thermal exposure

Accession number: 20200608123992
Authors: Wang, Li-Shuang (1); Tang, Chun-Hua (2); Dong, Hui (1); Li, Guang-Rong (2); Yang, Guan-Jun (2)
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Language: English
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Publisher: Elsevier Ltd
Abstract: Realizing engineering application of new candidate ceramic materials is highly required for the development of advanced thermal barrier coatings (TBCs). In addition to the optimization of intrinsic properties of ceramic materials, a feasible way is to tailor the structure of coatings based on the understanding of structure-properties evolution during thermal exposure. Herein, the unique sintering behavior and the consequent effect on spallation of plasma sprayed coatings made of a candidate material, i.e., La2Zr2O7 (LZO), were investigated by experiments and simulation. Experimental results showed that significant changes occurred for the porosity, 2D pore density and hardness during thermal exposure. The 2D pores are the essential microstructural characteristics and are dominantly responsible for the changes of mechanical property. Simulation results suggested that the healing of 2D pores increase the driving force for crack extension. This is the main cause for the spallation of ceramic top coat during thermal cyclic test. Finally, some structural designs towards long lifetime of TBCs were discussed. The dominant effects of 2D pores on mechanical properties and failure of TBCs provide fundamental understanding to the structural tailoring of advanced TBCs for future applications. © 2019 Elsevier Ltd and Techna Group S.r.l.
Number of references: 63
Main heading: Thermal barrier coatings
Controlled terms: Zirconium compounds - Sprayed coatings - Structural design - Spalling - Sintering - Lanthanum compounds - Plasma jets - Plasma spraying - Thermal Engineering - Ceramic materials
Uncontrolled terms: 2D pores - Engineering applications - La2Zr2O7 - Micro-structural characteristics - Plasma-sprayed ceramic coatings - Plasma-sprayed coatings - Thermal barrier coating (TBCs) - Thermal cyclic tests
Classification code: 408.1 Structural Design, General - 812.1 Ceramics - 813.1 Coating Techniques - 813.2 Coating Materials - 932.3 Plasma Physics
DOI: 10.1016/j.ceramint.2019.11.168
Funding Details: Number: 2018M631151, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 20190403, Acronym: -, Sponsor: -; Number: JZX7Y20190262062001, Acronym: -, Sponsor: Domain Foundation of Equipment Advance Research of 13th Five-year Plan; Number: 2019JQ-165, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 51901181, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

105. Interface tuning charge transport and enhanced thermoelectric properties in flower-like SnSe2 hierarchical nanostructures

Accession number: 20200408085415
Authors: Sun, Jun (1); Liu, Shuai (2); Wang, Chen (1); Bai, Yu (3); Chen, Guanjun (1); Luo, Qiaomei (1); Ma, Fei (1)
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Source title: Applied Surface Science

Abbreviated source title: Appl Surf Sci
Volume: 510
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Publication year: 2020
Article number: 145478
Language: English
ISSN: 01694332
CODEN: ASUSEE
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Thermoelectric properties could be well improved in hierarchical nanostructures due to the selective scattering on electrons and phonons by interfaces. In this paper, flower-like SnSe2 nanostructure is synthesized by solution-based method and, the nanostructure is sintered into pellets by spark plasma sintering (SPS) to evaluate thermoelectric properties. It is demonstrated that the flower-like SnSe2 nanostructure exhibits the ultralow thermal conductivity of 0.44 Wm-1 K-1 due to the strong phonon scattering by high-density of interface and grain boundaries, which have been confirmed by both experiments and simulation. Besides, the electrical transport of the flower-like SnSe2 is optimized synergistically owing to the moderate interfacial potential barrier. The highest power factor of 43 μWm-1 K-2 and competitive ZT value are measured at 550 K. The thermoelectric performance of flower-like SnSe2 is better that that of nanoplate and bulk counterparts. It provides an efficient method to improve the thermoelectric properties of SnSe2 based materials. © 2020 Elsevier B.V.
Number of references: 37
Main heading: Selenium compounds
Controlled terms: Nanostructures - Thermoelectric equipment - Grain boundaries - Phonons - Tin compounds - Spark plasma sintering - Thermoelectricity
Uncontrolled terms: Electrical transport - Electrons and phonons - Hierarchical Nanostructures - Interfacial potential - SnSe2 - Solvothermal - Thermoelectric performance - Thermoelectric properties
Classification code: 615.4 Thermoelectric Energy - 701.1 Electricity: Basic Concepts and Phenomena - 761 Nanotechnology - 933 Solid State Physics
Numerical data indexing: Temperature 5.50e+02K
DOI: 10.1016/j.apsusc.2020.145478
Funding Details: Number: BP2018008, Acronym: -, Sponsor: -; Number: tywl2019-01, Acronym: -, Sponsor: -; Number: -, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: BK20190221, Acronym: -, Sponsor: Natural Science Foundation of Jiangsu Province; Number: 2019TD-020, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 51901177, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was jointly supported by National Natural Science Foundation of China (Grant Nos. 51771144 , 51901177), Natural Science Foundation of Shaanxi Province (Nos. 2019TD-020 , 2019JLM-30 , 2017JZ015), 111 Project 2.0 by China (BP2018008), Natural Science Foundation of Jiangsu Province (No. BK20190221), the fund of the Shaanxi Key Laboratory of Surface Engineering and Remanufacturing (tywl2019-01), Fundamental Research Funds for the Central Universities . This work was carried out using the HPCC Platform at the Xian Jiaotong University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

106. Plastic deformation mechanism transition of Ti/Ni nanolaminate with pre-existing crack: Molecular dynamics study

Accession number: 20204809529424
Authors: Su, Meng-Jia (1, 2); Deng, Qiong (1, 2); An, Min-Rong (3); Liu, Lan-Ting (1, 2)
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Article number: 116201
Language: English
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Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: Tensile behaviors of Ti/Ni nanolaminate with model-I crack are investigated by molecular dynamics simulations. The Ti/Ni nanolaminates with center crack either in Ti layer or in Ni layer under different loading directions are utilized to systematically study the mechanical performance of the cracked material. The results indicate that pre-existing crack dramatically changes the plastic deformation mechanism of the Ti/Ni nanolaminate. Unlike the initial plastic deformation originating from the interface or weak Ti layer of the crack-free samples, the plastic behavior of cracked Ti/Ni nanolaminate first occurs at the crack tip due to the local stress concentration. Subsequent plastic deformation is dominated by the interaction between the crack and interface. The Ti/Ni interface not only impedes the movement of the initial plastic deformation carriers (dislocation, slip band, and deformation twinning) from the crack tip, but also promotes the movement of interfacial dislocations in the tension process. Microstructure evolution analysis further confirms that the plastic deformation mechanism transition is ascribed to the orientation-dependent tensile behavior at the crack tip, which is intrinsically attributed to the anisotropy of the certain crystal structure and loading direction of the cracked Ti/Ni nanolaminate. In addition, by analyzing the effects of different plastic deformation carriers on crack propagation in specific crystal, it can be discovered that the interfacial dislocations moving towards the crack tip can further promote the crack growth. © 2020 Chinese Physical Society and IOP Publishing Ltd.
Number of references: 47
Main heading: Molecular dynamics
Controlled terms: Crack propagation - Crystal orientation - Molecular orientation - Plastic deformation - Crack tips
Uncontrolled terms: Deformation twinning - Interfacial dislocations - Local stress concentration - Mechanical performance - Micro-structure evolutions - Molecular dynamics simulations - Orientation dependent - Plastic deformation mechanisms
Classification code: 801.4 Physical Chemistry - 931.1 Mechanics - 933.1.1 Crystal Lattice - 933.3 Electronic Structure of Solids - 951 Materials Science
DOI: 10.1088/1674-1056/aba2e5
Funding Details: Number: 2016KW-049, Acronym: -, Sponsor: -; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-827, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0672, Acronym: -, Sponsor: Education Department of Shaanxi Province;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

107. Pressured carbon dioxide hydrothermal leaching of catalytic gasification ash for dealkalization of solid waste, sodium catalyst recovery and carbon dioxide utilization

Accession number: 20194807737029
Authors: Mei, Yangang (1, 2); Wang, Zhiqing (1); Zhou, Xing (1, 2); Ding, Liang (3); Liu, Zheyu (1); Huang, Jiejie (1); Fang, Yitian (1)
Author affiliation: (1) State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan; Shanxi; 030001, China; (2) University of Chinese Academy of Sciences, Beijing; 100049, China; (3) Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Zhiqing(qcumt@sxicc.ac.cn)
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The alkali catalysts are easy to deactivate, causing low catalysts recovery. Meanwhile, the alkali in the gasification residue also poses potential hazard to the environment if improperly handled. So alkali recovery and alkali residue dealing hinder the progress of catalytic gasification. In this study, pressured carbon dioxide (CO2) hydrothermal leaching catalytic gasification ash to recover sodium (Na) catalyst as sodium carbonate (Na2CO3) and CO2 mineralization was studied, and the re-catalytic performance of recovered Na was evaluated as well. When gasified at 900 °C, the catalytic gasification ash is composed of sodium aluminum silicates [(Na2O)0.33NaAlSiO4]. By hydrothermal leaching at 180 °C with 2 MPa of CO2, 93.6% of Na can be leached, and the leaching residue is composed of amorphous Si and Al matters. At the same time, 138 g of CO2 can be mineralized by dealing with 1 Kg of catalytic gasification ash. Moreover, the recovered Na even shows better catalytic performance than fresh Na2CO3 with the same Na loaded amount, due to calcium (Ca) in the recovered Na can also enhance gasification reactivity. By pressured CO2 hydrothermal leaching, the catalyst can be recovered, the alkali in the gasification residue can be dealkalized, and CO2 can be mineralized as well, thus making catalytic gasification cleaner. Therefore, it is an economical and environmental-friendly way for alkali recovery and CO2 utilization. © 2019 Elsevier Ltd
Number of references: 45
Main heading: Carbon dioxide
Controlled terms: Fly ash - Gasification - Mullite - Coal ash - Metal recovery - Sodium Carbonate - Amorphous silicon - Catalysts - Leaching
Uncontrolled terms: Carbon dioxide capture - Carbon dioxide utilization - Catalyst recovery - Catalytic gasification - Catalytic performance - Environmental-friendly - Gasification reactivity - Sodium aluminum silicate
Classification code: 482.2 Minerals - 524 Solid Fuels - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Mass 1.38e-01kg, Percentage 9.36e+01%, Pressure 2.00e+06Pa, Temperature 1.17e+03K, Temperature 4.53e+02K
DOI: 10.1016/j.jclepro.2019.119109
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Compendex references: YES
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108. Asynchronous Injection-Production Process: A Method to Improve Water Flooding Recovery in Complex Fault Block Reservoirs (*Open Access*)

Accession number: 20200708169117
Authors: Yuan, Shibao (1, 2); Wang, Rui (2); Jiang, Haiyan (1); Xie, Qing (1); Chen, Shengnan (3); Xu, Bo (1); Li, Lehong (1); Zhang, Yupeng (1)
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Abbreviated source title: Math. Probl. Eng.
Volume: 2020
Issue date: 2020
Publication year: 2020
Article number: 5207430
Language: English
ISSN: 1024123X
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Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: The complex fault block reservoir has the characteristics of small area and many layers in vertical. Due to the influence of formation heterogeneity and well pattern, the situation that "water fingering is serious with water

injection, on the contrary, driving energy is low" frequently occurs in water flooding, which makes it difficult to enhance oil recovery. Asynchronous injection-production (AIP) process divides the conventional continuous injection-production process into two independent processes: injection stage and production stage. In order to study oil recovery in the fault block reservoir by AIP technology, a triangle closed block reservoir is divided into 7 subareas. The result of numerical simulation indicates that all subareas have the characteristic of fluid diverting and remaining oil in the central area is also affected by injected water at injection stage of AIP technology. Remaining oil in the central area is driven to the included angle and border area by injected water and then produced at the production stage. Finally, the oil recovery in the central area rises by 5.2% and in the noncentral area is also increased in different levels. The AIP process can realize the alternative change of reservoir pressure, change the distribution of flow field, and enlarge the swept area by injected water. To sum it up, the AIP process is an effective method to improve the oil recovery in complex fault-block reservoir by water flooding. © 2020 Shibao Yuan et al.
Number of references: 24
Main heading: Reservoirs (water)
Controlled terms: Secondary recovery - Oil well flooding - Floods - Injection (oil wells)
Uncontrolled terms: Complex fault block - Continuous injections - Enhance oil recoveries - Injected water - Production process - Production stage - Reservoir pressures - Water fingering
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations
Numerical data indexing: Percentage 5.20e+00%
DOI: 10.1155/2020/5207430
Compendex references: YES
Open Access type(s): All Open Access, Bronze, Green
Database: Compendex
Data Provider: Engineering Village

109. Adsorption Behavior of CH4, C2H6, and CO2on Moisture-Equilibrated Shale

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Authors: Tian, Feng (1, 2, 3); Li, Tiantai (1); Huang, Xing (1); Dang, Hailong (3)
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Language: English
ISSN: 08870624
E-ISSN: 15205029
CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Investigation on the influence of CO2 on adsorption behavior of CH4 and C2H6 in moisture-equilibrated shale is important for understanding the mechanism of CO2 injection for shale gas recovery. In this study, the adsorption capacities of CH4, C2H6, and CO2 on shale samples are first compared using the thermogravimetric method. The low-field nuclear magnetic resonance technique is then used to investigate the influence of CO2 on the behavior of adsorbed CH4 and C2H6 on shale, and the performance of CO2 introduction for CH4 and C2H6 recovery is thus evaluated. Test results show that the adsorption capacity is measured in sequence of C2H6 > CO2 > CH4 for dry shale; interestingly, the adsorption capacity of CO2 can be stronger than C2H6 on the moisture-equilibrated shale, indicating the potential of CO2 for enhancing C2H6 recovery. On the basis of the NMR results, the T2 spectrum decreases in the adsorbed CH4 region for the dry and moisture-equilibrated shale samples after injecting CO2. On the contrary, the T2 spectrum of the adsorbed C2H6 is almost unchanged for the dry shale, while it decreases remarkably for the moisture-equilibrated sample, indicating the potential of CO2 for enhancing C2H6 recovery for water saturated shale gas reservoirs. It is found that the recovery of CH4 and C2H6 from the dry cores is always lower than that for the moisture-equilibrated shale cores, suggesting that the moisture content in shale is beneficial for shale gas recovery during CO2 injection. This study inspires new understanding of the fundamental mechanisms of applying a CO2

injection method for shale gas development; more importantly, it provides new strategies that could be employed for shale resource production. © 2020 American Chemical Society.
Number of references: 36
Main heading: Carbon dioxide
Controlled terms: Adsorption - Nuclear magnetic resonance - Gases - Moisture - Shale gas - Petroleum reservoirs - Recovery
Uncontrolled terms: Adsorption behavior - Adsorption capacities - Fundamental mechanisms - Gas development - Injection method - Low field nuclear magnetic resonance - Shale gas reservoirs - Thermogravimetric method
Classification code: 512.1.1 Oil Fields - 512.2 Natural Gas Deposits - 522 Gas Fuels - 802.3 Chemical Operations - 804.2 Inorganic Compounds
DOI: 10.1021/acs.energyfuels.0c01614
Funding Details: Number: 51774236,51974254, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019D-5007-0204, Acronym: -, Sponsor: PetroChina Innovation Foundation; Number: 2019JQ-823, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: The authors also appreciate the financial support of the Open Foundation of Shaanxi Key Laboratory of Carbon Dioxide Sequestration and Enhanced Oil Recovery (under planning), the Foundation of State Key Laboratory of Petroleum Resources and Prospecting, the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2019JQ-823), the PetroChina Innovation Foundation (No. 2019D-5007-0204), and the National Science Foundation of China (No. 51774236, 51974254).
Compendex references: YES
Database: Compendex
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110. Failure analysis and service life prediction of 80sh casing steel under thermal cycle service environment

Accession number: 20202708891527
Authors: Wei, Wenlan (1); Guo, Longlong (1); Ju, Luyan (1); Han, Lihong (2); Feng, Yaorong (2); Zhang, Jianbing (1); Zhang, Qunbing (3)
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Pages: 1293-1300
Language: English
ISSN: 02555476
E-ISSN: 16629752
CODEN: MSFOEP
ISBN-13: 9783035715668
Document type: Conference article (CA)
Conference name: 20th Chinese Materials Conference, CMC 2019
Conference date: July 10, 2019 - July 14, 2019
Conference location: Chengdu, China
Conference code: 240909
Publisher: Trans Tech Publications Ltd
Abstract: The main exploitation process of heavy oil is cyclic steam huff and puff. Cyclic operation causes the cumulative damage and final failure to thermal recovery casing. The failure analysis shows that the main failure factor of thermal recovery casing is the low cycle fatigue process caused by thermal cycle, which results in the decrease of strength of casing material, thus causing casing fracture and failure. Based on the failure analysis results, the low cycle fatigue tests of 80SH thermal recovery casing steel under different temperature, strain, pre-strain and other conditions were carried out in the present study. The influencing factors, life prediction model and criterion of service safety of casing materials under thermal recovery service conditions were first proposed, which provides a strong theoretical basis for the service safety design theory of thermal recovery casing materials. The research results showed that the

strain limit and low cycle fatigue life were the two factors for service life. It may be suggested that life prediction needs to satisfy two criteria. The first is the strain criterion. The strain limit should be lower than the total strain during the long service life. And the second is the low cycle fatigue criterion, which satisfies the expectation of low cycle fatigue life under double conditions of strain amplitude and mean strain.
Number of references: 24
Main heading: Failure analysis
Controlled terms: Failure (mechanical) - Fatigue testing - Thermal fatigue - Low-cycle fatigue - Recovery - Forecasting - Strain - Crude oil - Computer system recovery - Safety engineering
Uncontrolled terms: Cumulative damage - Life prediction models - Long service life - Low cycle fatigue life - Low cycle fatigues - Low-cycle fatigue tests - Service environment - Service life prediction
Classification code: 512.1 Petroleum Deposits - 914 Safety Engineering - 951 Materials Science
DOI: 10.4028/www.scientific.net/MSF.993.1293
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

111. First-principles study of CO and NO adsorption on pristine and transition metal doped blue phosphorene

Accession number: 20202308800030
Authors: Chen, Guo-Xiang (1); Wang, Rui-Xue (1); Wang, Dou-Dou (2); Li, Han-Xiao (1); Liu, Shuai (1); Zhang, Jian-Min (3)
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Corresponding author: Chen, Guo-Xiang(guoxchen@xsyu.edu.cn)
Source title: Vacuum
Abbreviated source title: Vacuum
Volume: 179
Issue date: September 2020
Publication year: 2020
Article number: 109503
Language: English
ISSN: 0042207X
CODEN: VACUAV
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: First-principles calculations within the density functional theory (DFT-D2 method) is carried out to systematically investigate the structural, energetic, electronic and magnetic properties of toxic CO and NO gas molecules on pristine and transition metal (TM) atom (Fe, Co, Ni, Pd, Ag and Pt) doped blue phosphorene. Our calculations show that the CO and NO molecules are physisorbed on pristine blue phosphorene due to small adsorption energies, charge transfer, and large adsorption distances of the adsorbed systems. TM doping can significantly enhance the interaction between the gas molecules and the blue phosphorene, leading to the CO and NO molecules absorbed on TM doped blue phosphorene belong to chemisorption with relatively large adsorption energies and charge transfer, except for CO adsorbed on Ag doped blue phosphorene. Meanwhile, the enhancing interaction between the gas molecules and TM doped blue phosphorene can dramatically induce magnetism and electrical conductivity changes. These results indicate that TM doped blue phosphorene is a potential candidate to develop novel two-dimensional phosphorene-based gas sensors.
Number of references: 56
Main heading: Adsorption
Controlled terms: Gases - Gas detectors - Chemical sensors - Molecules - Platinum compounds - Magnetism - Calculations - Charge transfer - Transition metals - Density functional theory
Uncontrolled terms: Adsorbed system - Adsorption energies - Electrical conductivity - Electronic and magnetic properties - First-principles calculation - First-principles study - Gas molecules - Physisorbed

Classification code: 531 Metallurgy and Metallography - 701.2 Magnetism: Basic Concepts and Phenomena - 801 Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 914.1 Accidents and Accident Prevention - 921 Mathematics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 943.3 Special Purpose Instruments
DOI: 10.1016/j.vacuum.2020.109503
Funding Details: Number: 2014KJXX-70, Acronym: -, Sponsor: -; Number: 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), the Shaanxi Province Science and Technology Foundation (Grant no. 2014KJXX-70), and the Postgraduate Innovation and Practical Ability Training Program of Xi'an Shiyou University (Grant no. YCS19112035).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

112. Erratum: Durability of GFRC modified by calcium sulfoaluminate cement under elevated curing temperatures (Advances in Materials Science and Engineering (2019) 2019 (2915684) DOI: 10.1155/2019/2915684) (*Open Access*)

Accession number: 20202108704727
Authors: Song, Meimei (1, 2); Wu, Ke (3); Dou, Yihua (1)
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Corresponding author: Wu, Ke(ke.wu@ucd.ie)
Source title: Advances in Materials Science and Engineering
Abbreviated source title: Adv. Mater. Sci. Eng.
Volume: 2020
Issue date: 2020
Publication year: 2020
Article number: 3614543
Language: English
ISSN: 16878434
E-ISSN: 16878442
Document type: Erratum (ER)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: In the article titled "Durability of GFRC Modified by Calcium Sulfoaluminate Cement under Elevated Curing Temperatures" [1], author Ke Wu was omitted from the list of corresponding authors. (e publisher apologises for introducing this error during the production of the article. (e correct information now appears in the author information above. © 2020 Hindawi Limited. All rights reserved.
DOI: 10.1155/2020/3614543
ErratuFlg: 2004565372
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

113. Combustion-processed NiO/ALD TiO2 bilayer as a novel low-temperature electron transporting material for efficient all-inorganic CsPbIBr2 solar cell

Accession number: 20201608418155
Authors: Chai, Wenming (1); Zhu, Weidong (1); Chen, Dandan (2); Chen, Dazheng (1); Xi, He (1); Chang, Jingjing (1); Zhang, Jincheng (1); Zhang, Chunfu (1); Hao, Yue (1)
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Corresponding author: Zhu, Weidong(wdzhu@xidian.edu.cn)
Source title: Solar Energy
Abbreviated source title: Sol. Energy
Volume: 203

Issue date: June 2020
Publication year: 2020
Pages: 10-18
Language: English
ISSN: 0038092X
CODEN: SRENA4
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Low-temperature ALD TiO2 electron transporting layers (ETLs) are promising for all-inorganic perovskite solar cells (PSCs), such as the CsPbIBr2-based ones. However, the non-ideal interfacial level-alignment between ALD TiO2 and CsPbIBr2, as well as the concomitant defects in ALD TiO2 during preparation of upper CsPbIBr2 film severely limit the performance of final PSC. We report herein a new design of ETL by combining ALD TiO2 with low-temperature combustion-processed NiO. Although the underlying NiO layer has a p-type conductivity and is known as a hole transporting layer (HTL), the NiO/ALD TiO2 bilayer can serve as an ETL with fewer traps, larger conduction band minimum (CBM) offset with CsPbIBr2 film, along with the similar optical transmittance, in contrast with individual ALD TiO2 ETL. Consequently, the resulting optimized CsPbIBr2 PSC yields the superior efficiency of 9.71% and photovoltage of 1.272 V, both of which exceed those of the one based on individual ALD TiO2 ETL and even so-gel TiO2 ETL. Our work verifies the great applicability of NiO/ALD TiO2 ETL for CsPbIBr2 PSC and thereby explores a promising way to develop more low-temperature ETLs by combining conventional HTLs with ALD TiO2 layers. © 2020 International Solar Energy Society
Number of references: 55
Main heading: Nickel oxide
Controlled terms: Perovskite - Perovskite solar cells - Temperature - Film preparation - Titanium dioxide - Lead compounds - Bromine compounds - Combustion
Uncontrolled terms: Conduction-band minimum - Electron transporting layer - Electron transporting materials - Hole transporting layers - Interfacial levels - Low temperature combustion - Low temperatures - P type conductivity
Classification code: 482.2 Minerals - 641.1 Thermodynamics - 702.3 Solar Cells - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 9.71e+00%, Voltage 1.27e+00V
DOI: 10.1016/j.solener.2020.04.024
Funding Details: Number: 61704128,61804113,61874083,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019M663628, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: JB181107,JBX171103, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: All the authors gratefully acknowledge the financial support from the National Natural Science Foundation of China (61804113 , 61874083 , and 61704128), the 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 Fundamental Research Funds for the Central Universities (JB181107 and JBX171103).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

114. Bioremediation of Clay With High Oil Content and Biological Response After Restoration

Accession number: 20220231970
Authors: Li, Xiaokang (1); Li, Jinling (2); Qu, Chengtun (3); Yu, Tao (1); Du, Mingming (1)
Author affiliation: (1) Xi'an Shiyou University, China; (2) College of Chemistry and Chemical Engineering, Shaanxi Oil and Gas Pollution Control and Reservoir Protection Key Laboratory, Xi'an Shiyou University, Xi'an; 710065, China; (3) State Key Laboratory of Petroleum Pollution Control, China
Corresponding author: Li, Jinling(lijinling@xsyu.edu.cn)
Source title: ResearchSquare
Abbreviated source title: ResearchSquare
Issue date: December 30, 2020
Publication year: 2020
Language: English
Document type: Preprint (PP)

Publisher: ResearchSquare
Abstract: The clay with high oil content form soil lumps, which is hard for microbes to repair. In this paper, the bioremediation + biostimulation was applied to improve the bioremediation effect of the soil with high oil content, that modified by local cow dung and sandy soil, the ecological toxicity of the soil after restoration was further analyzed. After 53 days of bioremediation, the degradation efficiency with respect to the total petroleum hydrocarbon (TPH) content reached 76.9% ± 2.2%; the soil bacterial content reached 4.9 × 107 CFU/g soil and the results were better than those in the natural attenuation M1group of experimental soils. The relative abundances of petroleum-degrading bacteria added to M5 remained high (Achromobacter 9.44%, Pseudomonas 31.06%, and Acinetobacter 14.11%), and the proportions of some other indigenous bacteria (Alcanivorax and Paenibacillus) also increased. The toxicity of the bioremediated soil was reduced by seed germination and earthworm survival experiments. © 2020, CC BY.
Number of references: 40
Main heading: Bioremediation
Controlled terms: Bacteria - Biodegradation - Biotechnology - Clay - Degradation - Gasoline - Restoration - Seed - Toxicity
Uncontrolled terms: Bio-augmentation - Biological response - Biostimulation - Biostimulation and bioaugmentation - Clay with high oil content - Cow dung - Ecological evaluation - Modified clays - Oil contents - Soil ecological evaluation
Classification code: 454.2 Environmental Impact and Protection - 461.7 Health Care - 461.8 Biotechnology - 483.1 Soils and Soil Mechanics - 523 Liquid Fuels - 801.2 Biochemistry - 802.2 Chemical Reactions - 821.4 Agricultural Products
Numerical data indexing: Percentage 2.20E+00%, Percentage 7.69E+01%, Percentage 3.106E+01%, Percentage 1.411E+01%, Age 1.4522E-01yr, Percentage 9.44E+00%
DOI: 10.21203/rs.3.rs-134470
Compendex references: YES
Preprint source website: https://www.researchsquare.com/browse
Database: Compendex
Data Provider: Engineering Village

115. Bright-Dark Mode Coupling Model of Plasmons#

Accession number: 20220711655016
Authors: Zhang, Jing (1, 2); Xu, Yong-Gang (1, 3); Zhang, Jian-Xin (1); Guan, Lu-Lu (1); Li, Yong-Fang (1)
Author affiliation: (1) School of Physics and Information Technology, Shaanxi Normal University, Xi'an; 710119, China; (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) School of Science, Xi'an University of Posts and Telecommunications, Xi'an; 710121, China
Corresponding author: Zhang, Jing
Source title: Chinese Physics Letters
Abbreviated source title: Chin. Phys. Lett.
Volume: 37
Issue: 3
Issue date: March 2020
Publication year: 2020
Article number: 037101
Language: English
ISSN: 0256307X
E-ISSN: 17413540
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: We propose a coupling model to describe the interaction between the bright and dark modes of the plasmons of a dimer composed of two orthogonal gold nano-rods (GNRs), referred to as the BDMC model. This model shows that the eigen-frequencies of the coupled plasmons are governed by Coulomb potential and electrostatic potential. With the BDMC model, the behaviors of the coupling coefficient and the frequency offset, which is a new parameter introduced here, are revealed. Meanwhile, the asymmetric behavior of two eigen-frequencies related to gap of two GNRs is explained. Using the harmonic oscillator model and the coupled parameters obtained by the BDMC model, the bright mode absorption spectra of the dimer are calculated and the results agree with the numerical simulation. © Chinese Physical Society and IOP Publishing Ltd.
Number of references: 36
Main heading: Plasmons
Controlled terms: Electric fields - Frequency allocation - Nanorods - Oscillators (mechanical)

Uncontrolled terms: Coulomb potential - Coupled plasmon - Coupling coefficient - Coupling models - Dark modes - Eigenfrequency - Electrostatic potentials - Gold nano - Mode coupling - Nano-rods
Classification code: 601.1 Mechanical Devices - 701.1 Electricity: Basic Concepts and Phenomena - 716.3 Radio Systems and Equipment - 716.4 Television Systems and Equipment - 761 Nanotechnology - 931.3 Atomic and Molecular Physics - 932.3 Plasma Physics - 933 Solid State Physics
DOI: 10.1088/0256-307X/37/3/037101
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

116. The study of elastic properties of fractured porous rock based on digital rock (*Open Access*)

Accession number: 20202908936295
Authors: Zhao, Jianpeng (1, 2); Chen, Hui (3); Li, Ning (4)
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Corresponding author: Zhao, Jianpeng(zjpsnow@126.com)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 514
Part number: 2 of 5
Issue: 2
Issue title: 4th International Symposium on Resource Exploration and Environmental Science - 1. Resource Exploration and Utilization, Geography and Geological Engineering
Issue date: July 2, 2020
Publication year: 2020
Article number: 022022
Language: English
ISSN: 17551307
E-ISSN: 17551315
Document type: Conference article (CA)
Conference name: 4th International Symposium on Resource Exploration and Environmental Science, REES 2020
Conference date: April 25, 2020 - April 26, 2020
Conference location: Ordos, China
Conference code: 161594
Publisher: IOP Publishing Ltd
Abstract: Knowledge of the elastic properties of fractured rock plays a significant role in accurate and rigorous reservoir description. In this paper, we carry out a systematic study about the effect of fracture width, fluid properties on elastic properties of reservoir rocks based on digital rock technology. Digital rock models with different fracture width are reconstructed via a superposition reconstruction procedure which impose a fracture on an isotropic host rock. A modified Finite Element Method (FEM) is adopted to investigate rock elastic properties. The results show that the presence of fracture leads to a strong anisotropy of rock. The five elastic constants of the resultant TI medium are derived as a function of the properties of the fracture width and fluid bulk modulus. The aspect ratio of P-wave velocity and S-wave velocity (V p/V s) is a function of fluid bulk modulus and can be used to identify fractured gas reservoir. The results allow one to have a better understanding about the correlations of fracture, fluid and elastic properties of reservoir rocks. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 23
Main heading: Rocks
Controlled terms: Seismic waves - Shear waves - Elastic moduli - Elasticity - Acoustic wave velocity - Petroleum reservoirs - Wave propagation - Aspect ratio - Fracture
Uncontrolled terms: Elastic properties - Fluid bulk modulus - Fractured gas reservoirs - P-wave velocity - Reconstruction procedure - Reservoir description - Strong anisotropy - Systematic study
Classification code: 484 Seismology - 512.1.1 Oil Fields - 751.1 Acoustic Waves - 931.1 Mechanics - 951 Materials Science
DOI: 10.1088/1755-1315/514/2/022022
Funding Details: Number: 41804125, Acronym: -, Sponsor: -; Number: 2018JQ4043, Acronym: -, Sponsor: -; Number: 18JK0619, Acronym: -, Sponsor: Education Department of Shaanxi Province;

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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

117. HCOOH dissociation over the core-shell M@Pd bimetallic catalysts: Probe into the effect of the core metal type on the catalytic performance

Accession number: 20195107870065
Authors: Yang, Min (1); Wang, Baojun (1); Li, Zhiqin (2); Ling, Lixia (1); Zhang, Riguang (1)
Author affiliation: (1) Key Laboratory of Coal Science and Technology of Ministry of Education and Shanxi Province, Taiyuan University of Technology, Taiyuan; Shanxi; 030024, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Zhang, Riguang(zhangriguang@tyut.edu.cn)
Source title: Applied Surface Science
Abbreviated source title: Appl Surf Sci
Volume: 506
Issue date: 15 March 2020
Publication year: 2020
Article number: 144938
Language: English
ISSN: 01694332
CODEN: ASUSEE
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The core-shell bimetallic catalysts have exhibited unique catalytic performance due to the bimetallic synergetic effect. In this work, the catalytic activity and selectivity of HCOOH dissociation on the Mcore@Pdshell(M = Cu, Au, Co, Ni, Ag, Al) catalysts are investigated to reveal the effect of the core metal on the shell Pd catalytic performance. Density functional theory calculations with microkinetic modeling are used. The results showed that compared to the Pd catalyst, M@Pd(M = Au, Co, Ni, Ag) catalysts are highly selective to CO2 formation, while Al@Pd is favorable for CO formation. Especially, Ag@Pd catalyst not only presents the best activity and selectivity toward CO2 generation, but also decreases CO adsorption ability to inhibit its poisoning and reduce noble Pd usage. The analysis of the electronic properties about the average Bader charge and d-band center corresponding to the shell Pd identify the function of the core metal type in adjusting the shell Pd catalytic performance toward HCOOH dissociation, in which the ligand effect caused by charge transfer between the core metal to the shell Pd plays a key role. This study provides valuable information for the improved performance of the core-shell bimetallic catalysts by altering the types of core metal. © 2019 Elsevier B.V.
Number of references: 68
Main heading: Charge transfer
Controlled terms: Catalyst activity - Dissociation - Formic acid - Electronic properties - Palladium - Palladium compounds - Heterojunctions - Nickel compounds - Carbon dioxide - Shells (structures) - Silver compounds - Catalyst poisoning - Catalyst selectivity - Density functional theory - Aluminum compounds
Uncontrolled terms: Bimetallic catalysts - Catalytic performance - CO adsorption - Core metals - Core shell - D-band centers - Microkinetic modeling - Synergetic effect
Classification code: 408.2 Structural Members and Shapes - 547.1 Precious Metals - 714.2 Semiconductor Devices and Integrated Circuits - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
DOI: 10.1016/j.apsusc.2019.144938
Funding Details: Number: 21736007,21776193, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 201606935026, Acronym: CSC, Sponsor: China Scholarship Council;
Funding text: This work is financially supported by the National Natural Science Foundation of China (No. 21736007 and 21776193), the China Scholarship Council (201606935026) and the Top Young Innovative Talents of Shanxi . Appendix A
Compendex references: YES
Database: Compendex

Data Provider: Engineering Village

118. Applications of laser-induced breakdown spectroscopy (LIBS) combined with machine learning in geochemical and environmental resources exploration

Accession number: 20204709523285
Authors: Chen, Tingting (1); Zhang, Tianlong (1); Li, Hua (1, 2)
Author affiliation: (1) Key Laboratory of Synthetic and Natural Functional Molecular Chemistry of Ministry of Education, College of Chemistry & Material Science, Northwest University, Xi'an; 710127, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding authors: Li, Hua(huali@nwu.edu.cn); Zhang, Tianlong(tlzhang@nwu.edu.cn)
Source title: TrAC - Trends in Analytical Chemistry
Abbreviated source title: TrAC Trends Anal. Chem.
Volume: 133
Issue date: December 2020
Publication year: 2020
Article number: 116113
Language: English
ISSN: 01659936
E-ISSN: 18793142
CODEN: TTAEDJ
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: Conventional geological and environmental analyses rely heavily on the geologists' assessments and time-consuming laboratory analyses that are relatively burdensome. Certain features of laser-induced breakdown spectroscopy (LIBS), especially the rapid and without complex sample preparation analysis (e.g., the remote and on-site detections and multi-element analyses), can significantly accelerate the field or remote detection of geological and environmental resources. Moreover, the LIBS technique combined with machine learning becomes an effective means to improve the accuracy of classification and quantitative analysis of the information derived from LIBS spectra data sets. This paper presents a brief account of LIBS equipments, preparation of samples, the spectral fusion technology, field-portable and remote LIBS, the machine learning methods in LIBS, the applications of LIBS to analyzing various geological and environmental materials at some specific field sites during the past six years. Finally, the potential applications of LIBS for some future developments are proposed. © 2020 Elsevier B.V.
Number of references: 123
Main heading: Machine learning
Controlled terms: Classification (of information) - Spectrum analysis - Environmental technology - Geology - Geochemistry - Atomic emission spectroscopy - Laser induced breakdown spectroscopy
Uncontrolled terms: Accuracy of classifications - Environmental analysis - Environmental materials - Environmental resources - Laserinduced breakdown spectroscopy (LIBS) - Machine learning methods - Multielement analysis - Spectral fusion technologies
Classification code: 454 Environmental Engineering - 481.1 Geology - 481.2 Geochemistry - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence - 903.1 Information Sources and Analysis - 931.1 Mechanics
DOI: 10.1016/j.trac.2020.116113
Funding Details: Number: 2011YQ030113, Acronym: -, Sponsor: -; Number: 20JS144, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 21675123,22073074,21873076,21605123, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by National Natural Science Foundation of China [No. 22073074 , 21873076 , 21675123 , and 21605123], National Major Scientific Instruments and Equipment Development Project of China [2011YQ030113], and Scientific Research Program Funded by Shaanxi Provincial Education Department [20JS144].
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

119. Two-fluid modeling of a wet spouted fluidized bed with wet restitution coefficient model

Accession number: 20200708172249
Authors: Zhong, Hanbin (1); Zhang, Yaning (2); Xiong, Qingang (3); Zhang, Juntao (1); Zhu, Yuqin (1); Liang, Shengrong (1); Niu, Ben (1); Zhang, Xinyu (1)

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Corresponding author: Xiong, Qingang(qgxiong@126.com)
Source title: Powder Technology
Abbreviated source title: Powder Technol.
Volume: 364
Issue date: 15 March 2020
Publication year: 2020
Pages: 363-372
Language: English
ISSN: 00325910
E-ISSN: 1873328X
CODEN: POTEBX
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Hydrodynamics of wet fluidized beds is significantly affected by the liquid bridge force between solid particles. In this study, two-fluid modeling of wet fluidizations with wet restitution coefficient model was realized in Ansys Fluent® through its user-defined function portal. Wet restitution coefficient was calculated using the sub-model proposed by Davis et al. (Elastohydrodynamic rebound of spheres from coated surfaces, J. Fluid Mech., 2002, 468, 107–109.), which depends on liquid viscosity, liquid layer thickness, and impacting velocity. A spouted bed with central air nozzle at the bottom was chosen as the simulation system. The simulation was first validated against available experimental and CFD-DEM results. Then, effects of the liquid viscosity and liquid layer thickness on fluidization hydrodynamics and distributions of relevant quantities were investigated. The simulation results demonstrate that the effect of liquid viscosity is significant while the influence of liquid layer thickness can be ignored in the current study. Finally, some thoughts on future studies for two-fluid modeling of wet fluidizations with wet restitution coefficient model were discussed. © 2020 Elsevier B.V.
Number of references: 33
Main heading: Fluidization
Controlled terms: Computational fluid dynamics - Fluidized beds - Hydrodynamics - Liquids - Viscosity of liquids - Two phase flow
Uncontrolled terms: Liquid layer thickness - Liquid viscosity - Restitution coefficient - Spouted bed - Two fluid model
Classification code: 631.1 Fluid Flow, General - 723.5 Computer Applications - 802.3 Chemical Operations - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1016/j.powtec.2020.02.001
Funding Details: Number: 2018D-5007-0402, Acronym: -, Sponsor: PetroChina Innovation Foundation; Number: SKLHOP201506, Acronym: -, Sponsor: State Key Laboratory of Heavy Oil Processing;
Funding text: The authors acknowledge the support by PetroChina Innovation Foundation (No. 2018D-5007-0402) and State Key Laboratory of Heavy Oil Processing (No. SKLHOP201506).The authors acknowledge the support by PetroChina Innovation Foundation (No. 2018D-5007-0402) and State Key Laboratory of Heavy Oil Processing (No. SKLHOP201506).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

120. A study on pore systems of Silurian highly mature marine shale in Southern Sichuan Basin, China

Accession number: 20200608142536
Authors: Zhang, Weiwei (1, 2); Huang, Zhilong (1, 2); Guo, Xiaobo (3); Pan, Yongshuai (2); Liu, Baichuan (2)
Author affiliation: (1) State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum (Beijing), Beijing; 102249, China; (2) College of Geosciences, China University of Petroleum, Beijing; 102249, China; (3) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Huang, Zhilong(huang5288@163.com)
Source title: Journal of Natural Gas Science and Engineering
Abbreviated source title: J. Nat. Gas Sci. Eng.
Volume: 76
Issue date: April 2020

Publication year: 2020
Article number: 103094
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The porosity system in shale, which is a combination of organic-hosted pore and inorganic pore, plays a pivotal role in adsorbing methane for gas shale reservoir. In order to identify the porosity system with different properties and to give a quantitative characterization of pore structure for each individual porosity system, the dual liquid NMR method was conducted on six shale samples from the Lower Silurian Longmaxi Formation in the Southern Sichuan Basin. In shale reservoir, hydrophilic pore and oleophilic pore are respectively related to hydrophilic minerals and oleophilic organic matter. The NMR method detected the signal of water penetrating the water-wetting porosity system when saturated with water, which can reflect the pore size distribution (PSD) of hydrophilic porosity. The PSD of oleophilic pore can also be reflected when saturated with kerosene, vice versa. Generally, the NMR T2 spectra of sample saturated with DI water and kerosene, T2_water and T2_kerosene exhibit bimodal pattern, a dominant peak with a relaxation time range of 0.1–10 ms and a minor peak with a relaxation time ranging 10–100 ms. Generally, higher TOC content corresponds to large amounts of cumulative organic nanoscale pore. The organic-rich shale shows high content of organic-hosted pores and large amounts of inorganic pores which are validated by plane porosity statistics from the observation of SEM photographs. By correlating the two pore structure characterizing methods, the relaxivity of shale can be calculated to be 0.055–0.092 μm/ms when saturated with water. The quantitative estimation of organic-hosted porosity system and inorganic porosity system in the shale will provide a pivotal basis for elucidating gas occurrence states in shale. © 2019 Elsevier B.V.
Number of references: 54
Main heading: Kerosene
Controlled terms: Hydrophilicity - Relaxation time - Contact angle - Nuclear magnetic resonance spectroscopy - Pore structure - Pore size
Uncontrolled terms: Hydrophilic minerals - Inorganic pore - Liquid NMR - Organic pore - Organic-rich shales - Quantitative characterization - Quantitative estimation - Sichuan Basin
Classification code: 513.3 Petroleum Products - 523 Liquid Fuels - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.jngse.2019.103094
Funding Details: Number: -, Acronym: CUPB, Sponsor: China University of Petroleum, Beijing; Number: 2017ZX05035002-005, Acronym: -, Sponsor: Science and Technology Major Project of Guangxi; Number: 41702127, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The works in the paper were conducted with financial support from the National Science and Technology Major Project (2017ZX05035002-005) of China and were partially sponsored by National Natural Science Foundation of China (No. 41702127), China, and some experiments including SEM observation, TOC test, and XRD analysis were conducted in the State Key Laboratory of Petroleum Resources and Prospecting and China University of Petroleum, Beijing. We are highly grateful to the doctoral supervisor Mr Huang for his support, encouragement, and repeated discussions and to anonymous reviewers who give comments for the perfection and better publishment of the paper.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

121. HCOOH dissociation over the Pd-decorated Cu bimetallic catalyst: The role of the Pd ensemble in determining the selectivity and activity

Accession number: 20200608135143
Authors: Meng, Fanhui (1); Yang, Min (1); Li, Zhiqin (2); Zhang, Riguang (1)
Author affiliation: (1) Key Laboratory of Coal Science and Technology of Ministry of Education and Shanxi Province, Taiyuan University of Technology, Taiyuan 030024; Shanxi, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an 710065; Shaanxi, China
Corresponding author: Zhang, Riguang(zhangriguang@tyut.edu.cn)
Source title: Applied Surface Science
Abbreviated source title: Appl Surf Sci
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Article number: 145554
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Pd-decorated Cu bimetallic catalysts experimentally exhibited better catalytic performance toward hydrogenation reaction than the single Pd or Cu catalyst. This study is expected to identify the role of the Pd ensemble in determining the activity and selectivity, thus, HCOOH dissociation over the Pd-decorated Cu catalysts with different surface Pd distribution is fully examined by employing density functional theory calculations, including Pd1Cu8, Pd3Cu6, Pd6Cu3 and Pd9Cu0 catalysts, which are compared to the single Pd and Cu catalysts. The results found the Pd ensemble on the Pd6Cu3 and Pd9Cu0 surfaces with the Pd/Cu ratio of 6/3 and 9/0 exhibit higher selectivity and activity toward CO2 formation via the COOH intermediate, especially, Pd6Cu3 is superior to the single Pd; whereas the isolated Pd atom on the Pd1Cu8 and Pd3Cu6 surfaces with the Pd/Cu ratio of 1/8 and 3/6 dominantly produce CO via the COOH intermediate. Further, the structural and electronic properties reveal the role of the Pd ensemble in determining the catalytic performance of HCOOH dissociation. Our results provide a valuable clue and evaluation method in designing low-cost catalyst with the noble metal-decorated the non-noble metal catalysts, which can exhibit better catalytic performance by forming the surface ensemble of the noble metal. © 2020
Number of references: 60
Main heading: Density functional theory
Controlled terms: Binary alloys - Dissociation - Formic acid - Copper - Catalyst selectivity - Electronic properties - Hydrogenation - Palladium
Uncontrolled terms: Bimetallic catalysts - Catalytic performance - Cu-catalysts - Ensemble effect - Hydrogenation reactions - Low cost catalysts - Non-noble metal catalysts - Structural and electronic properties
Classification code: 544.1 Copper - 547.1 Precious Metals - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

122. Study of Shale Gas Release from Freshly Drilled Core Samples Using a Real-Time Canister Monitoring Technique: Release Kinetics, Influencing Factors, and Upscaling

Accession number: 20220311477055
Authors: Nie, Haikuan (1, 2); Yang, Zhengheng (1, 2); Dang, Wei (3, 4, 5); Chen, Qian (1, 2); Li, Pei (6); Li, Donghui (1, 2); Wang, Ruijing (4)
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E-ISSN: 15205029
CODEN: ENFUEM
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Publisher: American Chemical Society
Abstract: Gas release from organic-rich shale rock plays a significant role in the migration and production of hydrocarbons in the shale reservoir. Despite recent progress in gas adsorption/desorption experiments and molecular simulation, information on the actual gas release process remains stagnated. Here, we demonstrate the real-time canister monitoring technique as a powerful tool to investigate the kinetics of shale gas release from freshly drilled core samples. Combined with the adsorption capacity measurement, it is found that the gas released from the core in the canister is the gas that was in the adsorbed state in the reservoir, and the free gas and a fraction of adsorbed gas were already lost during coring. Then, the reaction-based pseudo-first-order and pseudo-second-order models and the diffusion-based double-exponential (DE) model are used to interpret the kinetics of shale gas release. Instead of the coefficient of determination (R2), the corrected Akaike information criterion technique (AICc) was used to determine the best fitting model. It is found that the DE model best described the kinetics of shale gas release from the core, and the success of the DE model suggests that the shale gas release from the core is a process of first-order, two-stage, and micropore diffusion-controlled. Further, to investigate the dependence of gas release kinetics, the half-life time (t1/2) was calculated and correlated with the adsorption capacity, gas concentrations, and total organic matter (TOC) content. It is shown that increasing the gas adsorption capacity, gas concentrations, and TOC content could accelerate the rate of shale gas release. In addition, the potential implications and an upscaling attempt of the release kinetics in evaluating the shale gas content and production are also discussed. We found that the slow stage of gas release controls the estimated ultimate recovery (EUR) of shale gas wells, while the estimation based on the fast stage would significantly lower the EUR. Overall, by using the real-time wellsite canister monitoring technique, this study provides a unique perspective for understanding the kinetics of gas release from tight shale rock, as well as the long-term shale gas production behavior. Copyright © 2020 American Chemical Society.
Number of references: 48
Main heading: Shale gas
Controlled terms: Kinetics - Reaction kinetics - Infill drilling - Gas adsorption - Monitoring - Gases
Uncontrolled terms: Adsorption capacities - Double exponential model - Drilled core - Gas concentration - Gas release - Monitoring techniques - Real- time - Release kinetics - Shale rocks - Upscaling
Classification code: 511.1 Oil Field Production Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 631.1 Fluid Flow, General - 802.2 Chemical Reactions - 802.3 Chemical Operations - 931 Classical Physics; Quantum Theory; Relativity
DOI: 10.1021/acs.energyfuels.9b04122
Funding Details: Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: TPR-2019-01, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: 2019JQ-367, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This study was supported by the projects "Large-scale enrichment of oil and gas in the one-way breakup-conjunction process within Tethys tectonic domain (no. 91755211)" and "Research on evolution characteristics of shale reservoirs of Longmaxi Formation in Sichuan Basin (no. 41872124)" of the National Natural Science Foundation of China, the Natural Science Basic Research Plan in Shaanxi Province of China (2019JQ-367), and the Open Funding of Key Laboratory of Tectonics and Petroleum Resources, Ministry of Education (TPR-2019-01).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

123. Performance evaluation of degradable temporary plugging agent in laboratory experiment

Accession number: 20204109310520
Authors: Liu, Shun (1); Guo, Tiankui (2); Rui, Zhenhua (3); Ling, Kegang (4)
Author affiliation: (1) College of Petroleum Engineering, Xian Shiyou University, Xian; 710065, China; (2) College of Petroleum Engineering, China University of Petroleum, Huadong; 266580, China; (3) Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge; MA; 02139, United States; (4) Department of Petroleum Engineering, University of North Dakota, Grand Forks; ND; 58202, United States
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Abbreviated source title: J Energy Resour Technol Trans ASME
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Publication year: 2020
Article number: 123002
Language: English
ISSN: 01950738
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CODEN: JERTD2
Document type: Journal article (JA)
Publisher: American Society of Mechanical Engineers (ASME), United States
Abstract: Temporary plugging fracturing is an effective way to enhance the fracture complexity and increase the stimulated reservoir volume (SRV) of unconventional reservoirs. The performance of temporary plugging agents (TPA) directly affects the success rate of temporary plugging. Currently, laboratory evaluation of the plugging effects of the TPA is rarely reported, and there are no industrial standards on laboratory evaluation of TPA plugging. In this study, two new experimental methods were used to evaluate a novel particulate TPA. The plugging performance of the TPA to the core end face and the propped fractures was measured through displacement experiments of cores, and the applicability of its basic performance to the temporary plugging fracturing was verified. Furthermore, the large-scale true triaxial simulation experiment of temporary plugging fracturing was carried out to confirm the influence mechanism of different factors on fracture propagation during temporary plugging. Finally, the influence rule of different types of combinations of TPA and placement patterns on the plugging was obtained based on laboratory evaluation of the conductivity. The results show that the novel TPA causes effective temporary plugging on the core end face and the propped fractures and has the strong plugging performance, and the TPA solubility in the carrying fluids decreases with the increase in the TPA concentration. The basic performance of the TPA meets the requirements of temporary plugging fracturing. If the proppants and 20% fibers are placed within the fracture in the mixed pattern, the fracture is initiated along the direction of the horizontal maximum principal stress. The preset fracture reduces the fracture initiation pressure. The fracture complexity is closely related to the placement pattern of TPA and proppants. If the preset fractures are filled by the uniform mixture or the plug of the 20/40 mesh or 20/80 mesh particulate TPA (4%), fibers (1%), and proppants, the fracture initiation pressure significantly increases, and the complex fractures are formed after fracturing. Effective plugging cannot be formed only by mixing the fibers with the proppants, and the uniform mixture of the proppants and 4% particulate TPA and the 6% particulate TPA at the front end of the fracture form a temporary plugging belt, achieving effective plugging. The fibers improve the conductivity under the low closure stress, and it has a certain effect of temporary plugging under the closure stress above 30 MPa. The research results provide the design consideration for creating the complex fracture by temporary plugging. Copyright © 2020 by ASME.
Number of references: 41
Main heading: Proppants
Controlled terms: Gas hydrates - Fracture - Methane - Hydration - Laboratories - Fibers - Mesh generation - Mixtures - Gasoline - Petroleum engineering
Uncontrolled terms: Design considerations - Displacement experiments - Fracture initiation pressures - In-laboratory experiments - Maximum principal stress - New experimental method - Stimulated reservoir volumes - Unconventional reservoirs
Classification code: 511.1 Oil Field Production Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 523 Liquid Fuels - 723.5 Computer Applications - 804.1 Organic Compounds - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 951 Materials Science
Numerical data indexing: Percentage 1.00e+00%, Percentage 2.00e+01%, Percentage 4.00e+00%, Percentage 6.00e+00%, Pressure 3.00e+07Pa
DOI: 10.1115/1.4047311
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Funding text: The authors would like to acknowledge the financial support of the National Natural Science Foundation of China (Grant No. 51874338), and express their gratitude to project ZR2019QEE005 supported by the Shandong Provincial Natural Science Foundation.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

124. A novel strategy for quantitative analysis of soil pH via laser-induced breakdown spectroscopy coupled with random forest

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Authors: Zhao, Mingjing (1); Yan, Chunhua (1); Feng, Yaozhou (1); Xue, Jia (2); Tang, Hongsheng (1); Zhang, Tianlong (1); Li, Hua (1, 2)
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Corresponding author: Li, Hua(huali@nwu.edu.cn)
Source title: Plasma Science and Technology
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Publication year: 2020
Article number: 074003
Language: English
ISSN: 10090630
E-ISSN: 20586272
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: pH is one of the significant properties of soil, and is closely related to the decomposition of soil organic matter, anion-cation balance, growth of plants and many other soil processes. In the present work, laser-induced breakdown spectroscopy (LIBS) technique coupled with random forest (RF) was proposed to quantify the pH of soil. First, LIBS spectra of soil was collected, and some common elements in soil were identified based on the National Institute of Science and Technology database. Then, in order to obtain a better predictive result, the influence of different input variables (full spectrum, different spectral ranges, the intensity of characteristic bands and characteristic lines) on the predictive performance of RF calibration model was explored with the evaluation indicators of root mean square error (RMSE) and coefficient of determination (R 2), the characteristic bands of four elements (Al, Ca, Mg and Si) were determined as the optimal input variables. Finally, the predictive performance of RF calibration model was compared with partial least squares calibration model with the optimal input variables and model parameters, and RF calibration model showed a better predictive performance, and the four evaluation indicators of R2 RMSEP, mean absolute error and mean relative error were 0.9687, 0.1285, 0.1114 and 0.0136, respectively. It indicates that LIBS technique coupled with RF algorithm is an effective method for pH determination of soil. © 2020 Hefei Institutes of Physical Science, Chinese Academy of Sciences and IOP Publishing.
Number of references: 38
Main heading: Soils
Controlled terms: Errors - Decision trees - Atomic emission spectroscopy - Laser induced breakdown spectroscopy - Mean square error - Random forests - Spectrum analysis - Least squares approximations
Uncontrolled terms: Coefficient of determination - Evaluation indicators - Laserinduced breakdown spectroscopy (LIBS) - Partial least squares calibrations - Predictive performance - Root mean square errors - Science and Technology - Soil organic matters
Classification code: 483.1 Soils and Soil Mechanics - 723.4.2 Machine Learning - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods - 922.2 Mathematical Statistics - 931.1 Mechanics - 961 Systems Science
DOI: 10.1088/2058-6272/ab6ac2
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

125. Sensitivity enhanced microfiber interferometer ammonia gas sensor by using WO3 nanorods coatings

Accession number: 20200208027655
Authors: Wang, Qiqi (1, 2, 3); Fu, Haiwei (1, 2, 3); Ding, Jijun (1, 2, 3); Yang, Chong (1, 2, 3); Wang, Shuai (1, 2, 3)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Engineering Research Center of Oil and Gas Resource Optical Fiber Detection, China; (3) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, China
Corresponding author: Fu, Haiwei(hwfu@xsyu.edu.cn)
Source title: Optics and Laser Technology
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Publication year: 2020
Article number: 106036
Language: English
ISSN: 00303992
CODEN: OLTCAS
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Rapid and accurate detection of toxic and harmful gases in the environment is an important means to prevent poisoning and leakage accidents. A tapered microfiber interferometer coated by WO3 nanorods for gas sensing is fabricated by using flame melting biconical taper method. As a coated material for the microfiber interferometer (MFI) ammonia gas sensor, the WO3 nanorods are made by hydrothermal method, and are dripped onto the surface of the sensor. The WO3 nanorods coating on the sensor surface can absorb ammonia molecules and generate charge transfer, which results in the shift of transmission spectrum. The experimental results show that the prepared sensor has high sensitivity and selectivity to ammonia gas. When the ammonia gas concentration is from 0 to 11640 ppm, the spectrum shift of the WO3 nanorods coated sensor is 16.23 nm. The sensor has good repeatability, selectivity and wide application prospects in the monitor of harmful gases. © 2020 Elsevier Ltd
Number of references: 23
Main heading: Nanorods
Controlled terms: Gases - Coated materials - Interferometers - Charge transfer - Coatings - Tungsten compounds - Ammonia - Gas detectors - Optical fibers
Uncontrolled terms: Ammonia gas sensors - Ammonia molecules - Ammonia sensing - Application prospect - Gas selectivity - Hydrothermal methods - Micro-fiber - Transmission spectrums
Classification code: 741.1.2 Fiber Optics - 761 Nanotechnology - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 813 Coatings and Finishes - 813.2 Coating Materials - 914.1 Accidents and Accident Prevention - 933 Solid State Physics - 941.3 Optical Instruments - 943.3 Special Purpose Instruments
Numerical data indexing: Size 1.62e-08m
DOI: 10.1016/j.optlastec.2019.106036
Funding Details: Number: YCS19211030, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 14JS073, Acronym: -, Sponsor: -; Number: 2019GY-176, Acronym: -, Sponsor: Science and Technology Innovation as a Whole Plan Projects of Shaanxi Province;
Funding text: This work is supported by the Research Foundation of Education Bureau of Shaanxi Province, China , under Grant 14JS073 , the Graduate Student Innovation Fund of Xi’an Shiyou University (YCS19211030). Science and Technology Plan Program in Shaanxi Province of China (Grant No. 2019GY-170 , Grant No. 2019GY-176).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

126. Estimation of organic and inorganic porosity in shale by NMR method, insights from marine shales with different maturities

Accession number: 20201508400586
Authors: Zhang, Weiwei (1, 2); Huang, Zhilong (1, 2); Li, Xin (1, 2); Chen, Jinlong (1, 2); Guo, Xiaobo (3); Pan, Yongshuai (1, 2); Liu, Baichuan (1, 2)
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Corresponding author: Huang, Zhilong(huang5288@163.com)
Source title: Journal of Natural Gas Science and Engineering
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Volume: 78
Issue date: June 2020
Publication year: 2020
Article number: 103290
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands

Abstract: The porosity system of shale reservoir contains organic pore and inorganic pore, of which the gas adsorption characteristics and wettability properties differ dramatically. In order to conduct estimation of organic pore and inorganic pore in shale reservoir, six marine shale samples were selected to quantify the proportion (vol%) of different pores by using the new method, in which the NMR T2 spectra of samples saturated with deionized water and kerosene were respectively acquired, representing pore size distribution of hydrophilic pore and lipophilic pore correspondingly. The NMR T2 signals of different saturating fluids were introduced to calculate the proportion (vol%) of organic pore and inorganic pore. Further, the observation of argon milled image of shale samples which can give statistical analysis is also conducted accordingly. The results from the two methods are almost in agreement, indicating feasibility of the new method. By using the method in shales with varying maturities, the proportions of organic and inorganic pores of shales in different evolution stages were figured out. Generally, the TOC is positively correlated with organic porosity that almost an organic porosity of 1.51–1.76% (vol.) is provided for per unit TOC (1.0%, wt.) in low-mature shale. And the porosity increase caused by per unit TOC (1.0%, wt.) during organic matter maturation is 2.53–3.41%, while the proportion of inorganic porosity continuously decreases with thermal maturity. From the study, it is significant that the organic porosity and inorganic porosity of shale with given TOC and thermal maturity can be roughly estimated. © 2020 Elsevier B.V.
Number of references: 67
Main heading: Deionized water
Controlled terms: Shale - Nuclear magnetic resonance spectroscopy - Gas adsorption - Pore size
Uncontrolled terms: Adsorption characteristic - Different evolutions - Hydrophilic pores - Marine shales - Organic matter maturations - Organic porosities - Saturating fluids - Thermal maturity
Classification code: 445.1 Water Treatment Techniques - 802.3 Chemical Operations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 1.00e+00%
DOI: 10.1016/j.jngse.2020.103290
Funding Details: Number: -, Acronym: CUPB, Sponsor: China University of Petroleum, Beijing; Number: 2017ZX05035002-005, Acronym: -, Sponsor: Science and Technology Major Project of Guangxi; Number: 41702127, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The works in the paper were conducted with financial support from the National Science and Technology Major Project (2017ZX05035002-005) and were partially sponsored by National Natural Science Foundation of China (No. 41702127) and the AAPG FID for students, and some experiments including SEM observation, TOC test, and XRD analysis were conducted in the State Key Laboratory of Petroleum Resources and Prospecting and China University of Petroleum (Beijing) . We are truly grateful to the doctoral supervisor Mr Huang for his support, encouragement, and repeated discussions and to anonymous reviewers who make constructive suggestions for the improvement and better publishment of the paper.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

127. C2H2 semi-hydrogenation over the supported Pd and Cu catalysts: The effects of the support types, properties and metal-support interaction on C2H4 selectivity and activity

Accession number: 20194407594480
Authors: Guan, Zun (1); Xue, Mifeng (1); Li, Zhiqin (2); Zhang, Riguang (1); Wang, Baojun (1)
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Corresponding author: Zhang, Riguang(zhangriguang@tyut.edu.cn)
Source title: Applied Surface Science
Abbreviated source title: Appl Surf Sci
Volume: 503
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Publication year: 2020
Article number: 144142
Language: English
ISSN: 01694332
CODEN: ASUSEE
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands

Abstract: Aiming at identifying the effects of the support types, properties and the metal-support interaction of the supported catalysts on C2H4 selectivity and its formation activity for C2H2 semi-hydrogenation, the corresponding mechanism over the supported Pd and Cu catalysts with different supports are fully studied based on DFT calculations. This work indicates that the support types and properties change the selectivity of C2H4 and its formation activity, for the supported Pd catalysts, the oxygen-vacancy anatase and rutile TiO2 supports present much better selectivity of C2H4 and its formation activity than the pure Pd catalyst does; especially, the anatase exhibits better catalytic performance than the rutile, in which the oxygen-vacancy show the crucial function. For the supported Cu catalysts, γ–Al2O3 is unable to enhance C2H4 selectivity compared to the pure Cu catalyst, whereas MgO support improves C2H4 selectivity but reduces its formation activity. Further, the metal-support interaction of the supported Pd catalysts are much stronger than that of the supported Cu catalyst, which results in better activity and selectivity of C2H4 over the supported Pd catalysts. This study can give out a valuable clue for the preparation of the supported Pd or Cu catalysts with better performance in C2H2 semi-hydrogenation. © 2019
Number of references: 63
Main heading: Hydrogenation
Controlled terms: Alumina - Aluminum oxide - Density functional theory - Titanium dioxide - Catalyst selectivity - Catalyst supports - Magnesia - Oxide minerals - Oxygen vacancies - Copper - Oxygen - Palladium - Catalyst activity
Uncontrolled terms: Catalytic performance - Crucial functions - DFT calculation - Metal-support interactions - Support types - Supported Cu - Supported Pd - Supported Pd catalysts
Classification code: 482.2 Minerals - 544.1 Copper - 547.1 Precious Metals - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 933.1 Crystalline Solids
DOI: 10.1016/j.apsusc.2019.144142
Funding Details: Number: 21736007,21776193, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work is financially supported by the National Natural Science Foundation of China (No. 21776193), the Key projects of National Natural Science Foundation of China (No. 21736007) and the Top Young Innovative Talents of Shanxi, and U.S. NSF-sponsored NCAR-Wyoming Supercomputing Center (NWSC).This work is financially supported by the National Natural Science Foundation of China (No. 21776193), the Key projects of National Natural Science Foundation of China (No. 21736007) and the Top Young Innovative Talents of Shanxi, and U.S. NSF-sponsored NCAR-Wyoming Supercomputing Center (NWSC).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

128. Flux-mediated growth strategy enables low-temperature fabrication of high-efficiency all-inorganic CsPbIBr2 perovskite solar cells

Accession number: 20194907795876
Authors: Zhu, Weidong (1); Chai, Wenming (1); Deng, Minyu (1); Chen, Dandan (2); Chen, Dazheng (1); Zhang, Jincheng (1); Zhang, Chunfu (1); Hao, Yue (1)
Author affiliation: (1) State Key Discipline Laboratory of Wide Band Gap Semiconductor Technology & Shaanxi Joint Key Laboratory of Graphene, School of Microelectronics, Xidian University, Xi'an; Shaanxi; 710071, China; (2) College of Science, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Zhu, Weidong(wdzhu@xidian.edu.cn)
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Abbreviated source title: Electrochim Acta
Volume: 330
Issue date: 10 January 2020
Publication year: 2020
Article number: 135325
Language: English
ISSN: 00134686
CODEN: ELCAAV
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Flux-mediated crystal growth strategy is highlighted by its feasibility of low-temperature, fast growth of high-quality metal oxides, as a result of enhanced diffusion of reactants. Herein, this strategy is successfully extended for

CsPbIBr2 film for the first time by simply incorporating a certain amount of CH3NH3Br into the precursor film. The CH3NH3Br species served as flux agents could dramatically boost the growth and coarsening of CsPbIBr2 grains. Hence, a dense and uniform CsPbIBr2 film consisted of micro-sized and high-crystallinity grains is attained at a low temperature of 200 °C. This processing temperature is lowered by one-third in contrast to the previous methods. More importantly, the carbon-based, all-inorganic perovskite solar cell (PSC) based on such desired CsPbIBr2 film yields an optimized efficiency of 10.82%, which stands a record-high value for CsPbIBr2-based PSCs without configuration modifications. Meanwhile, the PSC delivers excellent operation stability under light, thermal, and humidity stresses. Consequently, the work contributes to establish a facile approach to low-temperature preparation of high-quality CsPbIBr2 film for development of practical and efficient PSCs. © 2019 Elsevier Ltd
Number of references: 58
Main heading: Perovskite solar cells
Controlled terms: Coarsening - Lead compounds - Processing - Temperature - Efficiency - Film preparation - Perovskite - Bromine compounds - Film growth - Ostwald ripening - Crystallinity
Uncontrolled terms: Flux synthesis - High crystallinity - High-efficiency - Low temperature preparation - Low temperatures - Low-temperature fabrication - Operation stability - Processing temperature
Classification code: 482.2 Minerals - 641.1 Thermodynamics - 702.3 Solar Cells - 913.1 Production Engineering - 913.4 Manufacturing - 933.1 Crystalline Solids - 951 Materials Science
Numerical data indexing: Percentage 1.08e+01%, Temperature 4.73e+02K
DOI: 10.1016/j.electacta.2019.135325
Funding Details: Number: 61804113,61874083,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: JB181107,JBX171103, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: All the authors gratefully acknowledge the financial support from the National Natural Science Foundation of China (61804113 and 61874083), the Initiative Postdocs Supporting Program of China (BX20190261), the National Natural Science Foundation of Shaanxi Province (2018ZDCXL-GY-08-02-02 and 2017JM6049), and the Fundamental Research Funds for the Central Universities of China (JB181107 and JBX171103). Appendix A
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

129. Combined Process of Hydrocracking and Hydrofining of Coal Tar

Accession number: 20204809542307
Authors: Niu, Menglong (1); Song, Zhaoyang (1); Pan, Liuyi (2); Yan, Yongli (1); Liu, Ning (3); Li, Dong (2); Li, Wenhong (2)
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Source title: Energy and Fuels
Abbreviated source title: Energy Fuels
Volume: 34
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Pages: 13614-13624
Language: English
ISSN: 08870624
E-ISSN: 15205029
CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: For coal tar hydrotreating technology, the combination of hydrofining and hydrocracking is a valuable research topic. Therefore, this paper will discuss this topic by comparing three different hydrogenation processes, which include hydrofining (process A); catalyst gradation of hydrofining and hydrocracking (process B); and hydrocracking of diesel fraction produced by hydrofining (process C). The research methods are mainly divided into three parts: product composition analysis, product properties analysis, and reaction kinetics analysis. The study reached the following conclusions: First, the combination of hydrofining and hydrocracking can get better quality gasoline and diesel oil. Second, process C has many advantages over process B and process A. The carbon

number and hydrogen number of process C products are more concentrated. In process C, alkaline nitrogen is separated from coal tar in the form of ammonia with water or gas, so process C can effectively improve the service life of hydrocracking catalyst. Third, compared with the two catalysts graded and packed in the reactor, the two-stage hydrogenation method is more convenient in adjusting the ratio of gasoline to diesel oil. Finally, process C is recommended to complete the hydrogenation of coal tar through the analysis of the product composition, reaction path, and reaction kinetics. © 2020 American Chemical Society.
Number of references: 43
Main heading: Gasoline
Controlled terms: Product development - Association reactions - Coal tar - Coal - Diesel engines - Ammonia - Reaction kinetics - Catalysts - Hydrocracking - Hydrogenation
Uncontrolled terms: Analysis of the product - Diesel fractions - Hydrocracking catalysts - Hydrogenation process - Hydrotreating technology - Product composition - Product property - Research topics
Classification code: 411.2 Coal Tar - 523 Liquid Fuels - 524 Solid Fuels - 612.2 Diesel Engines - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 913.6 Product Development; Concurrent Engineering
DOI: 10.1021/acs.energyfuels.0c02096
Funding Details: Number: 2018GY-08, Acronym: -, Sponsor: -;
Funding text: We gratefully acknowledge the financial support of the Key R&D Program Projects in Shaanxi Province (2018GY-08).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

130. Research on the mechanical properties of repaired clinched joints with different forces

Accession number: 20201608460432
Authors: Chen, Chao (1, 2); Ran, Xiangkun (1, 2); Pan, Qing (1, 2); Zhang, Huiyang (2); Yi, Ruixiang (1); Han, Xiaolan (3)
Author affiliation: (1) State Key Laboratory of High Performance Complex Manufacturing, Light Alloy Research Institute, Central South University, Changsha; 410083, China; (2) School of Mechanical and Electrical Engineering, Central South University, Changsha; 410083, China; (3) Mechanical Engineering College, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Pan, Qing(porfcsu@163.com)
Source title: Thin-Walled Structures
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Volume: 152
Issue date: July 2020
Publication year: 2020
Article number: 106752
Language: English
ISSN: 02638231
CODEN: TWASDE
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Recently, lightweight materials have been increasingly used to build engineering structures, especially automotive structures. Mechanical clinching, an advanced joining technology, is widely used to join lightweight materials on the structures. The clinched joint may be deformed or damaged when it bears higher shearing forces. Till now, there is no effective repairing technology to repair deformed/damaged clinching joints. A novel repairing process is thus proposed and studied in this paper. A custom-built rivet and two flat dies were used as main repairing tools. Different damaging forces were applied on clinched joints to produce different damaged joints. The damaging force, cross-sectional profile, neck thickness, and shearing force of the repaired joints were investigated. The novel process is suitable to repair deformed/damaged clinching joints. As for the deformed joint, the deformed neck can be reshaped to restore to its original shape in the repairing process. As for the damaged joint, the separated sheets are hooked by a new interlock generated by the custom-built rivet. Compared with clinched joint, the repaired joint can get higher shear strength, which is significant for the safety of engineering structures. © 2020 Elsevier Ltd
Number of references: 48
Main heading: Shearing
Controlled terms: Repair - Rivets - Riveting - Shear strength
Uncontrolled terms: Advanced joining - Automotive structures - Cross sectional profiles - Engineering structures - Lightweight materials - Repaired joints - Repairing process - Repairing technologies

Classification code: 604.1 Metal Cutting - 913.5 Maintenance
DOI: 10.1016/j.tws.2020.106752
Funding Details: Number: 2019RS1002, Acronym: -, Sponsor: -; Number: 2019JQ-372, Acronym: -, Sponsor: -; Number: 51805416, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: CAST, Sponsor: China Academy of Space Technology; Number: ZZYJKT2019-01, Acronym: -, Sponsor: State Key Laboratory of High Performance Complex Manufacturing;
Funding text: This research work is supported by the National Natural Science Foundation of China (Grant No. 51805416), Young Elite Scientists Sponsorship Program by CAST , Natural Science Foundation of Hunan Province , Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2019JQ-372 , Research Fund of State Key Laboratory of High Performance Complex Manufacturing (Grant No. ZZYJKT2019-01 , ZZYJKT2018-15), and Huxiang High-Level Talent Gathering Project of HUNAN Province (Grant No. 2019RS1002).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

131. Temperature-insensitive optical fiber reflective micro-liquid level sensor base on the drop shape quasi-Mach Zehnder interferometer

Accession number: 20202208775723
Authors: Liu, Qinpeng (1); He, Xue (1); Fu, Haiwei (1); Yang, Dexing (2); Xiao, Fajun (2); Wang, Xiangyu (1)
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Source title: Optik
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Volume: 216
Issue date: August 2020
Publication year: 2020
Article number: 164893
Language: English
ISSN: 00304026
Document type: Journal article (JA)
Publisher: Elsevier GmbH
Abstract: An optical fiber micro-liquid level sensor based on a quasi-Mach Zehnder (MZ) structure is proposed and demonstrated experimentally. Design, fabrication and the principle of the quasi-MZ interferometer based on the drop shape are analyzed. The experimental results show that the micro-liquid level sensitivity of the sensor is 338.0 pm/mm with the linearity of 0.981, the corresponding measurement range is from 0 mm to 6.5 mm, and it exhibits temperature independence in the absence of any compensation. As a micro-liquid level sensor with the performance, thus it has the potential for the important field of micro-liquid level measurement. © 2020 Elsevier GmbH
Number of references: 25
Main heading: Mach-Zehnder interferometers
Controlled terms: Optical fibers - Drops - Liquids - Optical fiber fabrication
Uncontrolled terms: Drop shape - M-Z interferometer - Mach-Zehnder - Measurement range - Micro-liquid - Temperature independence - Temperature-insensitive
Classification code: 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 941.3 Optical Instruments
Numerical data indexing: Size 0.00e+00m to 6.50e-03m
DOI: 10.1016/j.ijleo.2020.164893
Funding Details: Number: 2017ZX05019006, Acronym: -, Sponsor: -; Number: 61735014, Acronym: -, Sponsor: -; Number: 2017YFB0405502, Acronym: -, Sponsor: -; Number: 18JS093, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work was supported in part by Funding National Natural Science Foundation of China (nos. 61735014 , 61927812), National Key Research and Development Plan, Key strategic advanced electronic materials (no. 2017YFB0405502), National Science and Technology Project, Large Oil and Gas Field and Coal Bed Gas Development Project (no. 2017ZX05019006), in part Shaanxi Provincial Education Department (Program no.18JS093) and " Open Fund of Shaanxi Key Laboratory of Optical Information Technology Foundation ".
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

132. Development of platinum assisted ternary catalyst with high activity and selectivity at working temperature of proton-exchange membrane fuel cells for preferential oxidation of CO

Accession number: 20202608865901
Authors: Naren, Tuya (1); Jing, Guojuan (1); Xue, Lei (1); Wang, Qi (1); Zhao, Yuansong (1); Li, Caixia (1); Lu, Suhong (2); Wu, Jinfang (1); Zeng, Shanghong (1)
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Abbreviated source title: Int J Hydrogen Energy
Volume: 45
Issue: 41
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Publication year: 2020
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Language: English
ISSN: 03603199
CODEN: IJHEDX
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The development of superior catalysts for preferential oxidation of CO has always maintained challenging in heterogeneous catalysis. Herein it is found that the Pt0.05/CuO–CeO2 catalyst exhibited high activity and selectivity for preferential oxidation of CO at working temperature of proton-exchange membrane fuel cells (~80 °C). The studies indicate that the presence of platinum and cerium promote the generation of oxygen vacancy and the dissociation of O2 molecules. Meanwhile, the introduction of platinum facilitates the reduction of copper and cerium species as well as enhances the quantity of lattice oxygen. The timely update of lattice oxygen promotes CO oxidation with the help of oxygen vacancy. The finding may provide new ideas for developing the excellent ternary catalyst for preferential oxidation of CO at the proton-exchange membrane fuel cells working temperature. © 2020 Hydrogen Energy Publications LLC
Number of references: 44
Main heading: Platinum
Controlled terms: Platinum compounds - Oxidation - Oxygen - Proton exchange membrane fuel cells (PEMFC) - Catalyst activity - Cerium - Cerium oxide - Copper compounds - Catalyst selectivity - Oxygen vacancies
Uncontrolled terms: Co oxidation - High activity - Lattice oxygen - Preferential oxidation - Superior catalysts - Ternary catalysts - Working temperatures
Classification code: 547.1 Precious Metals - 547.2 Rare Earth Metals - 702.2 Fuel Cells - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 933.1 Crystalline Solids
DOI: 10.1016/j.ijhydene.2020.05.251
Funding Details: Number: -, Acronym: IMAU, Sponsor: Inner Mongolia Agricultural University; Number: -, Acronym: -, Sponsor: Natural Science Foundation of Inner Mongolia; Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

133. Electrochemical Performance of Steel Embedded in CSA Concrete and Its Interfacial Microstructure (*Open Access*)

Accession number: 20203209027418
Authors: Song, Meimei (1, 2); Li, Qiu (2); Wu, Ke (3); Dou, Yihua (1)

Author affiliation: (1) School of Mechanical Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) State Key Laboratories of Silicate Materials for Architectures, Wuhan University of Technology, Wuhan; 430070, China; (3) School of Mechanical and Materials Engineering, University College Dublin, Dublin, Ireland
Source title: Advances in Materials Science and Engineering
Abbreviated source title: Adv. Mater. Sci. Eng.
Volume: 2020
Issue date: 2020
Publication year: 2020
Article number: 4761854
Language: English
ISSN: 16878434
E-ISSN: 16878442
Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: Calcium sulfoaluminate cement (CSA) is a low-carbon cementitious material that significantly reduces alkalinity and produces calcium hydroxide-free (CH-free) matrix environment in comparison to ordinary Portland cement (OPC). It might be, however, less efficient towards the passivation of steel in concrete and further investigation before widespread adoption is required. In this project, scanning electron microscopy/energy dispersive X-ray spectroscopy (SEM/EDX) on polished samples was employed to provide the interfacial characterization of steel reinforced CSA concrete and study the relationship of interfacial quality and corrosion resistance of the embedded steel. The galvanostatic polarization behavior indicates that the steel embedded in CSA concrete remains passive for 28 days in absence of Cl- ions and carbonation. Microstructure analysis has shown that there is an Al-enriched layer at interfacial zone in CSA concrete with the main hydration product of AH3, which is also alkaline and is expected to improve the steel passivity. Furthermore, the interfacial zone has markedly reduced porosity compared to the bulk matrix, which leads to reduced possibility of current flow between anode and cathode and therefore improves the corrosion resistance of the embedded reinforcement. © 2020 Meimei Song et al.
Number of references: 19
Main heading: Corrosion resistance
Controlled terms: Portland cement - Reinforcement - Electrodes - Hydrated lime - X ray spectroscopy - Lime - Steel corrosion - Hydration - Microstructure - Scanning electron microscopy - Low carbon steel
Uncontrolled terms: Calcium sulfoaluminate cement - Electrochemical performance - Embedded reinforcements - Galvanostatic polarization - Interfacial characterization - Interfacial microstructure - Microstructure analysis - Ordinary Portland cement
Classification code: 412.1 Cement - 539.1 Metals Corrosion - 545.3 Steel - 804.2 Inorganic Compounds - 951 Materials Science
Numerical data indexing: Age 7.67e-02yr
DOI: 10.1155/2020/4761854
Funding Details: Number: SYSJJ2019-17, Acronym: -, Sponsor: -; Number: 51674199, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 51674199) and State Key Laboratories of Silicate Materials for Architectures, Wuhan University of Technology in China (No. SYSJJ2019-17).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

134. Natural fractures at depth in the Lower Cretaceous Kuqa Depression tight sandstones: Identification and characteristics

Accession number: 20211910335134
Authors: Nian, Tao (1, 2); Li, Yanze (3); Hou, Tao (4); Tan, Chengqian (1, 2); Liu, Chao (1, 2)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an Shaanxi; 710065, China; (2) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an Shaanxi; 710065, China; (3) Jidong Oilfield Company, PetroChina, Tangshan Hebei; 063000, China; (4) Huabei Oilfield Company, PetroChina, Renqiu Hebei; 062552, China
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Source title: Geological Magazine
Abbreviated source title: Geol. Mag.

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Pages: 1299-1315
Language: English
ISSN: 00167568
E-ISSN: 14695081
Document type: Journal article (JA)
Publisher: Cambridge University Press
Abstract: The Kuqa Depression in the northern Tarim Basin, NW China, is characterized by fault-controlled anticlines where natural fractures may influence production. Natural fractures in the Lower Cretaceous tight sandstones in the depression have been studied using seismic profiles, borehole images, cores and thin-sections. Results show that thrust faults, two types of opening-mode macrofractures and two types of microfractures are present. Thrust faults were generated during Cenozoic N-S-directed tectonic shortening and have hydraulically linked Jurassic source rocks and Cretaceous sandstones. Opening-mode fractures can be subdivided on the basis of sizes, filling characteristics and distribution patterns. Type 1 macrofractures are barren or mainly calcite-lined. They have straight traces with widths (opening displacements) that are of the order of magnitude of 10 μm, suggesting that their primary role is that of migration channels. Type 2 macrofractures are calcite-filled opening-mode fractures. They have an elliptical or tabular shape with sharply tapering tips. Transgranular microfractures are lens-shaped and open or filled mostly by calcite; maximum widths range between 0.01 mm and 0.1 mm. Intragranular microfractures are the most common microfracture type. They are filled by calcite, feldspar or quartz. The macrofractures and transgranular microfractures have regular distributions, while most intragranular microfractures are irregularly distributed owing to their inherited origin. The results imply that natural fractures in the tight sandstones were formed as tectonic, diagenetic and natural hydraulic origins. In situ stress and cementation analyses suggest that Type 1 macrofractures and their genesis-related microfractures have controlled the present flow system of the tight sandstones. © 2020 Cambridge University Press.
Number of references: 100
Main heading: Calcite
Controlled terms: Faulting - Natural fractures - Feldspar - Sandstone - Textures
Uncontrolled terms: Distribution patterns - Lower Cretaceous - Northern Tarim basin - Opening displacement - Opening mode fracture - Regular distribution - Tectonic shortening - Tight sandstones
Classification code: 421 Strength of Building Materials; Mechanical Properties - 482.2 Minerals - 484.1 Earthquake Measurements and Analysis - 804.2 Inorganic Compounds
Numerical data indexing: Size 1.00e-05m to 1.00e-04m, Size 1.00e-05m
DOI: 10.1017/S0016756819001444
Funding Details: Number: 41772090,41872133, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019M650783, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2017ZX05009-002, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This study was funded by China Postdoctoral Science Foundation (Grant No. 2019M650783), the National Natural Science Foundation of China (Grant Nos. 41772090 and 41872133) and the National Science and Technology Major Project of China (Grant No. 2017ZX05009-002). We thank Chengwen Xiao and Lei Zhou (in the Tarim Oilfield Company, PetroChina) for data preparation, and the Tarim oilfield for allowing data to be shared for this research. Dr Qiucheng Xu and Min Li are also thanked for their help during the revision. We thank two anonymous reviewers, Dr John Hooker and Prof. Olivier Lacombe for their constructive suggestions to improve the paper.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

135. Detection of Sparse Distributions of Nanoscale Gold Spheres on the Surface of an Optical Fiber

Accession number: 20223512658915
Authors: Gang, Tingting (1, 2, 3, 4); Bai, Xiaohong (1, 2, 4); Prezgot, Daniel (3); Liu, Fu (1); Ianoul, Anatoli (3); Albert, Jacques (1)
Author affiliation: (1) Department of Electronics, Carleton University, 1125 Colonel By Drive, Ottawa; ON; K1S 5B6, Canada; (2) School of Physics, Northwest University, Xi'an; 710127, China; (3) School of Science, Xi'An Shiyou University, Xi'an; 710065, China; (4) Department of Chemistry, Carleton University, 1125 Colonel By Drive, Ottawa; ON; K1S 5B6, Canada
Corresponding author: Albert, Jacques(jacques_albert@carleton.ca)

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Abbreviated source title: Opt. InfoBase Conf. Pap
Part number: 1 of 1
Issue title: Optical Fiber Sensors, OFS 2020
Issue date: 2020
Publication year: 2020
Article number: Th4.30
Language: English
ISBN-13: 9781557523075
Document type: Conference article (CA)
Conference name: 27th International Conference on Optical Fiber Sensors, OFS 2020
Conference date: June 8, 2020 - June 12, 2020
Conference location: Washington, DC, United states
Conference code: 181672
Publisher: Optica Publishing Group (formerly OSA)
Abstract: Polarized transmission spectra of tilted fiber Bragg gratings (TFBG) are used to detect 10-20 nm-sized gold particles with densities as low as 7 particles/μm2 on the fiber surface. © 2021 The Author(s).
Number of references: 7
Main heading: Fiber Bragg gratings
Controlled terms: Gold
Uncontrolled terms: Fibre surfaces - Gold particles - Gold spheres - Nano scale - Sparse distribution - Tilted fiber Bragg grating - Transmission spectrums
Classification code: 547.1 Precious Metals
Numerical data indexing: Size 1.00E-08m to 2.00E-08m
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

136. Four-metal-element quantitative analysis and pollution source discrimination in atmospheric sedimentation by laser-induced breakdown spectroscopy (LIBS) coupled with machine learning

Accession number: 20200808199956
Authors: Zhang, Xin (1); Li, Nan (1); Yan, Chunhua (1); Zeng, Jiahui (1); Zhang, Tianlong (1); Li, Hua (1, 2)
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Corresponding author: Zhang, Tianlong(tlzhang@nwu.edu.cn)
Source title: Journal of Analytical Atomic Spectrometry
Abbreviated source title: J Anal At Spectrom
Volume: 35
Issue: 2
Issue date: February 2020
Publication year: 2020
Pages: 403-413
Language: English
ISSN: 02679477
E-ISSN: 13645544
CODEN: JASPE2
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: The laser-induced breakdown spectroscopy (LIBS) technique coupled with random forest (RF) and least squares support vector machine (LSSVM) methods was proposed to perform the quantitative and classification analyses of atmospheric sedimentation. The LIBS spectra of 16 atmospheric sedimentation samples with different locations were obtained via the LIBS measurement system, and the major elements of the atmospheric sedimentation samples were identified by the National Institute of Standards and Technology (NIST) database. For quantitative analysis, first, the best pretreatment method needs to be selected to process the LIBS spectra of the four metal elements (Pb, Cu, Zn and Al) of atmospheric sedimentation samples obtained from 16 locations. Then, RF, LSSVM and PLS calibration models were constructed with the optimal pretreatment spectra as input variables. The

performances of the three calibration models were compared by the correlation coefficient of cross-validation (RCV2) and root mean square error of cross-validation (RMSECV) to obtain an optimal model. Finally, the optimal model was verified by the correlation coefficient of prediction (RP2) and root mean square error of prediction (RMSEP). The satisfactory quantitative results of Pb, Cu and Al are the RF calibration model, and Zn is the LSSVM calibration model. For classification analysis, first, the best pretreatment method needs to be selected to process the LIBS spectra of the atmospheric sedimentation samples. Then, RF, LSSVM and PLS-DA were constructed with the best pretreatment spectra as input variables. Finally, the five factors, i.e., accuracy, sensitivity, precision, specificity and area under curve (AUC) were used to evaluate the predictive performance of the three classification models, and the LSSVM classification model exhibited better prediction in pollution source discrimination. It was confirmed that the LIBS technique coupled with the RF and LSSVM methods is a promising approach to achieve the analysis of atmospheric sedimentation. © 2020 The Royal Society of Chemistry.
Number of references: 62
Main heading: Sedimentation
Controlled terms: Decision trees - Pollution - Least squares approximations - Mean square error - Support vector machines - Forecasting - Metal analysis - Atomic emission spectroscopy
Uncontrolled terms: Classification analysis - Correlation coefficient - Laserinduced breakdown spectroscopy (LIBS) - Least squares support vector machines - National Institute of Standards and Technology - Predictive performance - Root mean square errors - Root-mean-square error of predictions
Classification code: 723 Computer Software, Data Handling and Applications - 802.3 Chemical Operations - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.6 Numerical Methods - 922.2 Mathematical Statistics - 961 Systems Science
DOI: 10.1039/c9ja00360f
Funding Details: Number: 21375105,21605123,21675123,21873076, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JQ2013, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 21873076, 21675123, 21605123 and 21375105); Natural Science Basic Research Plan in Shanxi Province of China (No. 2018JQ2013).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

137. Acoustic and fractal analyses of the mechanical properties and fracture modes of bedding-containing shale under different seepage pressures (*Open Access*)

Accession number: 20203008963277
Authors: Wu, Zhonghu (1); Lou, Yili (1); Yin, Shuai (2); Wang, Anli (3); Liu, Hao (4); Sun, Wenjibin (4); Zuo, Yujun (4); Chen, Bin (4)
Author affiliation: (1) College of Civil Engineering, Guizhou University, Guiyang, China; (2) School of Earth Science and Engineering, Xi'an Shiyou University, Xi'an, China; (3) Guizhou Province Quality and Safety Traffic Engineering Monitoring and Inspection Center CO., LTD, Guiyang, China; (4) Mining College, Guizhou University, Guiyang, China
Corresponding author: Wu, Zhonghu(wuzhonghugzu@163.com)
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Abbreviated source title: Energy Sci. Eng.
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Issue date: October 1, 2020
Publication year: 2020
Pages: 3638-3656
Language: English
E-ISSN: 20500505
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: The mechanical properties and failure modes of shale that contains bedding were analyzed under coupled seepage pressure and stress. In the numerical model, seven sets of shale samples with different dip-bedding values were considered, and a seepage-stress coupling numerical simulation was carried out. The results showed that the compressive strength of shale exhibited obvious anisotropy with increase in the bedding angle, and the compressive strength decreased with an increase in the osmotic pressure. The elastic modulus of shale showed an increasing trend with increase in the bedding angle, while the osmotic pressure had little effect on the elastic modulus of shale.

The results also showed that weak bedding had a significant impact on the shale failure mode. When the osmotic pressure was 4MPa, the shale fracture mode showed five failure modes. When the osmotic pressure was 8MPa, the shale fracture mode exhibited four failure modes. When the osmotic pressure was 12MPa, the shale fracture mode showed four failure modes. As the osmotic pressure increased, the osmotic pressure played a leading role in the shale rupture process. The spatial distribution of the acoustic emission demonstrated some self-similarity patterns, and its fractal characteristics were analyzed. It was found that the fractal dimension better reflects the rupture damage to the shale. The larger the fractal dimension is, the more severe the rupture of shale. © 2020 The Authors. Energy Science & Engineering published by the Society of Chemical Industry and John Wiley & Sons Ltd.
Number of references: 52
Main heading: Fractal dimension
Controlled terms: Acoustic emission testing - Osmosis - Fracture - Shale - Compressive strength - Elastic moduli - Numerical models - Seepage - Failure modes
Uncontrolled terms: Coupled seepage - Fractal analysis - Fractal characteristics - Fracture mode - Rupture process - Seepage pressure - Seepage-stress couplings - Self-similarities
Classification code: 751.2 Acoustic Properties of Materials - 802.3 Chemical Operations - 921 Mathematics - 951 Materials Science
DOI: 10.1002/ese3.772
Funding Details: Number: YJSCXJH [2019] 033, Acronym: -, Sponsor: -; Number: KT201804, Acronym: -, Sponsor: -; Number: 51574093,51774101,51964007, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: [2017]5788#49,[2017]63,[2018]1107,[2019]1075, Acronym: GZU, Sponsor: Guizhou University; Number: 2016#4011, Acronym: -, Sponsor: Startup Project for High-level Talents of Guizhou Institute of Technology; Number: QYNYL[2017]0013, Acronym: -, Sponsor: Program for First-class Discipline Construction in Guizhou Province;
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Compendex references: YES
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138. Investigation of a renovating process for failure clinched joint to join thin-walled structures

Accession number: 20201108292437
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Corresponding author: Chen, Chao(profchenchao@163.com)
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Document type: Journal article (JA)
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Abstract: The clinched joint may be deformed or damaged under a high shear load on the thin-walled structure, which may cause an accident. In order to avoid the accident, a renovating process for the deformed and damaged joint was proposed and investigated in this paper. The clinched joints were gotten by clinching equipment in clinching process. Shear process was employed to produce deformed and damaged joints with different shear forces. Then the deformed and damaged joints were renovated under a force of 35 kN with two flat dies and a customized rivet. Through static shear test on the renovated joints, the failure mode, shear strength and energy absorption were obtained. Renovating force, failure mode, main geometrical parameters, cross-sectional profile, shear strength, and energy absorption were discussed on renovated joints. The energy absorption and shear strength of all the joints are increased after the renovating process. It has been verified to be available for this process to renovate the deformed and damaged joint. © 2020 Elsevier Ltd
Number of references: 43
Main heading: Energy absorption
Controlled terms: Failure (mechanical) - Rivets - Accidents - Geometry - Thin walled structures
Uncontrolled terms: Clinching process - Cross sectional profiles - Flat dies - High shear - Shear force - Shear process - Shear tests
Classification code: 914.1 Accidents and Accident Prevention - 921 Mathematics
Numerical data indexing: Force 3.50e+04N
DOI: 10.1016/j.tws.2020.106686
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

139. Rules acquisition of formal decision contexts based on three-way concept lattices

Accession number: 20200208001420
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ISSN: 00200255
CODEN: ISIJBC
Document type: Journal article (JA)
Publisher: Elsevier Inc.
Abstract: Three-way concept lattices can supply much more information than classical concept lattices since they contain the positive information and negative information between objects and attributes simultaneously. Taking advantage of this, the rules acquisition for formal decision contexts from the perspective of three-way concept lattices are discussed, and the results are compared with the common decision rules based on classical concept lattices. Firstly, the definition of object-induced three-way consistence of a formal decision context is presented. Then, positive decision rules and negative decision rules are proposed for an object-induced three-way consistent formal decision context. Furthermore, we give semantic explanation for these rules, and compare them with common rules obtained

from a strongly consistent lattice. In parallel, the similar issues are investigated from the perspective of attributes, including the definition of attribute-induced three-way consistence of a formal decision context, rules acquisition based on an attribute-induced three-way consistent formal decision context, and rules comparison. Finally, the relationships among the three types of consistence, namely, object-induced three-way consistence, attribute-induced three-way consistence, and existing strongly consistence are discussed to make the contents compact. Some theoretical examples are given to illustrate the main results of this paper. © 2019 Elsevier Inc.
Number of references: 64
Main heading: Formal concept analysis
Controlled terms: Semantics - Mergers and acquisitions - Information analysis
Uncontrolled terms: Concept Lattices - Decision rules - Definition of attributes - Formal decision context - Negative information - Rules acquisition - Three-way decision
Classification code: 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis
DOI: 10.1016/j.ins.2019.12.024
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

140. Productivity analysis for a horizontal well with multiple reorientation fractures in an anisotropic reservoir (*Open Access*)

Accession number: 20204709515976
Authors: Sun, S. (3); Edwards, M.G. (3); Frank, F. (3); Li, J.F. (3); Salama, A. (3); Yu, B. (3); Wang, Mingxian (1); Fan, Zifei (2); Zhao, Lun (2); Xing, Guoqiang (3); Zhao, Wenqi (2); Tan, Chengqian (1)
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Language: English
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CODEN: RFPTBH
Document type: Journal article (JA)
Publisher: Editions Technip
Abstract: Reorientation fractures may be formed in soft and shallow formations during fracturing stimulation and then affect well productivity. The principal focus of this study is on the productivity analysis for a horizontal well with multiple reorientation fractures in an anisotropic reservoir. Combining the nodal analysis technique and fracture-wing method, a semi-analytical model for a horizontal well with multiple finite-conductivity reorientation fractures was established to calculate its dimensionless productivity index and derivative for production evaluation. A classic case in the literature was selected to verify the accuracy of our semi-analytical solution and the verification indicates this new solution is reliable. Results show that for a fixed fracture configuration the dimensionless productivity index of the proposed model first goes up and then remains constant with the increase of fracture conductivity, and optimal fracture conductivity can be determined on derivative curves. Strong permeability anisotropy is a negative factor for well production and the productivity index gradually decreases with the increase of anisotropic factor. As principal fracture angle goes up, horizontal well's productivity index increases correspondingly. However, the effect of reoriented fracture angle on the productivity index is not as strong as that of principal fracture angle. When reoriented fracture angle is smaller than principal fracture angle, reoriented factor should be as low as possible to achieve optimal productivity index. Meanwhile, well productivity index rises up with the increase of fracture number and fracture spacing, but the horizontal

well has optimal reorientation fracture number and fracture spacing to get the economical productivity. Furthermore, the influence of the rotation of one central reorientation fracture on productivity index is weaker than that caused by the rotation of one external reorientation fracture. In addition, the asymmetrical distribution of one or more reorientation fractures slightly affects the productivity index when fracture conductivity is high enough. © M. Wang et al., published by IFP Energies nouvelles, 2020.
Number of references: 42
Main heading: Fracture
Controlled terms: Productivity - Anisotropy - Horizontal wells
Uncontrolled terms: Anisotropic reservoirs - Asymmetrical distributions - Dimensionless productivity index - Fracture conductivities - Permeability anisotropy - Semi-analytical model - Semi-analytical solution - Well productivity index
Classification code: 512.1.1 Oil Fields - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.2516/ogst/2020078
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Funding text: The authors gratefully acknowledge the financial support from the National Science and Technology Major Project of China (No. 2017ZX05030-002 & No. 2017ZX05013-004).Acknowledgments. The authors gratefully acknowledge the financial support from the National Science and Technology Major Project of China (No. 2017ZX05030-002 & No. 2017ZX05013-004).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

141. A Simple and Robust Total Variation-Based Inversion Scheme for Transient Electromagnetic Data (*Open Access*)

Accession number: 20200908225020
Authors: Rao, Liting (1); Gao, Jianshen (1); Wu, Xin (2); Wang, Youcheng (3); Jia, Huiqin (1)
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Corresponding author: Rao, Liting(ltrao@xsyu.edu.cn)
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Article number: 8949492
Language: English
E-ISSN: 21693536
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: Transient electromagnetic (TEM) data are conveniently inverted to visualized underground structure with the widely used Occam's inversion. However, in sedimentary environments, Occam's inversion performs poorly in reproducing the sharp boundaries as it produces smoothed results of subsurface geophysical properties. Here, we develop a simple and robust total variation (TV) based inversion scheme for TEM data to preserve sharp boundaries and improve the accuracy of recovered underground structure. To solve the standard L2-TV optimization problem, we propose a reconstructing minimization (RM) approach. The TV-based inversion scheme is divided into two phases. In Phase I the misfit is brought down to a desired level utilizing Occam's inversion. In Phase II we utilize RM approach to implement TV regularization until the convergent result is achieved. Taking advantage of the excellent stability of Occam's inversion, the TV-based inversion scheme has the characteristics of robustness to different initial models. The switch process between Occam's inversion and the RM approach is rather simple to realize due to their similar solution forms. The synthetic and field data examples validate the efficiency and accuracy of the proposed TV-based inversion scheme. We further present a novel analysis based on reconstruction of stabilizer to illustrate the reason for their distinctive behaviors of TV-based inversion and Occam's inversion. © 2013 IEEE.
Number of references: 22

Main heading: Underground structures
Controlled terms: Transient analysis
Uncontrolled terms: Geophysical properties - Optimization problems - Reconstructing minimization approach - Sedimentary environment - Sharp boundaries - Total variation - Transient electromagnetics - Tv regularizations
Classification code: 408.1 Structural Design, General
DOI: 10.1109/ACCESS.2020.2963917
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Database: Compendex
Data Provider: Engineering Village

142. First principle study on electronic structure, elastic properties and debye temperature of pure and doped KCaF3

Accession number: 20202408816212
Authors: Liu, Xing (1, 2); Fu, Jia (1)
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Corresponding author: Fu, Jia(fujia@xsyu.edu.cn)
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Article number: 109504
Language: English
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CODEN: VACUAV
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: As a potential functional material in the perovskite family, the electronic structure, elasticity, Debye temperature and anisotropy of pure and doped KCaF3 structures are investigated based on density functional theory (DFT). The virtual crystal approximation (VCA) and supercell doping methods are employed to study the relation between the dopant amount and band gap. Results show that: (1) The pure KCaF3 is an indirect band-gap semiconductor, with Young's modulus E of 64.20 GPa and band gap of 6.151 eV; (2) Band gap of doped KCaF3 after the supercell doping decreases to 4.900 eV, with the top of valence band and the bottom of conduction band changed while the doped KCaF3 becomes a direct band gap semiconductor; (3) Based on GGA and Reuss-Voigt-Hill methods, the E values of doped KCaF3 after VCA and supercell doping are 71.48 GPa and 84.02 GPa, respectively, demonstrating that the doped structure is stiffer than undoped structure. The bulk modulus to shear modulus ratio of pure KCaF3 seems to be relatively ductile, and the universal anisotropic index shows that both pure and doped KCaF3 exhibit fairly high elastic anisotropy. This research provides theoretical guidance for the design of new ABX3-type materials with better performance. © 2020 Elsevier Ltd
Number of references: 60
Main heading: Electronic structure
Controlled terms: Structural properties - Anisotropy - Elastic moduli - Functional materials - Energy gap - Structural design - Density functional theory - Semiconductor doping - Design for testability - Perovskite - Elasticity
Uncontrolled terms: Direct band gap semiconductors - Doped structures - Doping methods - Elastic anisotropy - Elastic properties - First-principle study - Indirect band gap - Virtual crystal approximation

Classification code: 408 Structural Design - 408.1 Structural Design, General - 482.2 Minerals - 712.1 Semiconducting Materials - 922.1 Probability Theory - 931.2 Physical Properties of Gases, Liquids and Solids - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science
Numerical data indexing: Electron_Volt 4.90e+00eV, Pressure 6.42e+10Pa, Pressure 7.15e+10Pa, Pressure 8.40e+10Pa
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Data Provider: Engineering Village

143. Prevention and Control Strategy for Multi-group Epidemics Based on Delay and Isolation Control (*Open Access*)

Accession number: 20210809954675
Authors: Shu-Guang, L.I.U. (1); Xiao-Long, Chen (2); Xing-Xing, Zhang (1); Wu-Yang, Chen (1)
Author affiliation: (1) Huangshan University, School of Mechanical and Electrical Eng, Huangshan, China; (2) Xi'an Petroleum University, School of Mechanical Engineering, Xi'an, China
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Article number: 9327877
Language: English
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Conference name: 2020 Chinese Automation Congress, CAC 2020
Conference date: November 6, 2020 - November 8, 2020
Conference location: Shanghai, China
Conference code: 166835
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at the prevention and control of multi-group epidemics, the dynamic model of disease transmission is established, and an optimal delay and isolation strategy is proposed. The control variables in the model represent the strength of various measures taken to block and isolate contact between groups. The optimal control problem is solved by Pontryagin maximum principle and the corresponding numerical iterative algorithm is given. The results show that the delay and isolation control strategy can effectively control the epidemic of infectious diseases while minimizing the cost of infectious diseases. The outbreak of the COVID-19 in 2020 is a serious threat to people's lives and health. It is because of the timely adoption of delay and isolation control strategy of "early detection and early isolation" and "joint-prevention and jointcontrol", China took the lead in the fight against the epidemic situation and made an example for the whole world. © 2020 IEEE.
Number of references: 16
Main heading: COVID-19
Controlled terms: Disease control - Chemical detection - Iterative methods - Health risks - Optimal control systems
Uncontrolled terms: Control strategies - Control variable - Disease transmission - Infectious disease - Numerical iterative algorithm - Optimal control problem - Optimal delay - Prevention and controls
Classification code: 461.7 Health Care - 731.1 Control Systems - 801 Chemistry - 921.6 Numerical Methods
DOI: 10.1109/CAC51589.2020.9327877
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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144. Exploration of Biological Genetic Code from the Perspective of i Ching

Accession number: 20210809955260
Authors: Shu-Guang, L.I.U. (1); Xiao-Long, Chen (2); Xing-Xing, Zhang (1); Wu-Yang, Chen (1)
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Conference name: 2020 Chinese Automation Congress, CAC 2020
Conference date: November 6, 2020 - November 8, 2020
Conference location: Shanghai, China
Conference code: 166835
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: I Ching, which came into being at the time of Yin and Zhou dynasties, is a classical work combining symbol system and concept system. Over the Thousands of years of evolving and interpretation, not only its philosophy is abundant, but also its symbol system contains more and more complete mathematical logicality. From the deduction of scientific logic, since we are looking for the origin and noumenon of the universe, everything in the universe as the research object must be the evolutions and derivatives of the origin and noumenon, so the evolution principle of TaiQi can naturally be used to guide scientific research. In the field of biological genetics, the model construction of the genetic theory system has an amazing coincidence with the I Ching's symbol system. In this paper, by comparing the biological genetics with I Ching, the corresponding relationship between the triplet code of nucleotides and 64 hexagrams is found out from the principle of I Ching evolution, and the divination interpretation of the three termination information codes is given from the perspective of I Ching. It has been proved that the model construction of the theoretical system of biogenetics has an amazing coincidence with the symbol system of the book of changes. © 2020 IEEE.
Number of references: 12
Main heading: Nucleotides
Controlled terms: Codes (symbols) - DNA - Gene encoding
Uncontrolled terms: Biological genetics - Concept Systems - Genetic theory - Information codes - Model construction - Research object - Scientific researches - Theoretical system
Classification code: 461.2 Biological Materials and Tissue Engineering - 461.9 Biology - 723.2 Data Processing and Image Processing
DOI: 10.1109/CAC51589.2020.9326703
Compendex references: YES
Database: Compendex
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145. Synthesis and Properties of Sodium Dodecyl Sulfate-Derived Multifunctional Surfactants

Accession number: 20204109303462
Authors: Minlan Gao (1); Bai, Yun (1, 2); Dong, Sanbao (1); Zhang, Rongjun (1, 3); Zhang, Jie (1); Pu, Chunsheng (2); Chen, Gang (1, 3)
Author affiliation: (1) Shaanxi Province Key Laboratory of Environmental Pollution Control and Reservoir Protection Technology of Oilfields, Xian Shiyou University, Xian; 710065, China; (2) School of Petroleum Engineering, Petroleum University of China (Huadong), Qingdao; 266580, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing; 102206, China
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Source title: Russian Journal of Physical Chemistry A
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Language: English
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CODEN: RJPCBS
Document type: Journal article (JA)
Publisher: Pleiades journals
Abstract: Abstract: Sodium dodecyl sulfate (SDS) was modified by a aldol reaction with formaldehyde. The molar ratios of SDS to formaldehyde were 1: 1, 1: 2, 1: 3, and 1: 4, the obtained products were named as HSDS(1: 1), HSDS(1: 2), HSDS(1: 3), HSDS(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 research results obtained show that the best foaming concentration of the products with different molar ratio HSDS(1: 1) to HSDS(1: 4) is 0.4%. When the concentration of the surfactant solution is 0.4%, the half life time of the HSDS(1: 1) reaches 7.71 min. Temperature, methanol and inorganic salts have great influence on the foaming ability of the products with different reaction conditions HSDS(1: 1) to HSDS(1: 4). In the presence of methanol and inorganic salts, the foam will disappear at an accelerated rate. But when the methanol concentration is less than 20%, the foam formed by SDS and HSDS(1: 1) to HSDS(1: 4) is HSDS(1: 2) > SDS > HSDS(1: 3) > HSDS(1: 1) > HSDS(1: 4). When the salinity reaches 200 g/L, the product with molar ratio of 1: 4 (HSDS(1: 4)) can still produce 350mL foam, indicating that it has a certain salt resistance. When the concentration was 0.1 g/L, the emulsifying ability with different molar ratios is HSDS(1: 3) > HSDS(1: 4) > HSDS(1: 2) > SDS > HSDS(1: 1); when the concentration was 0.2 g/L, the emulsifying ability was HSDS(1: 4) > HSDS(1: 3) > HSDS(1: 2) > SDS > HSDS(1: 1). The emulsifying ability of SDS and the products obtained at different molar ratios is general, and the emulsion will stratify after 30 min, followed by foam, crude oil and water from top to bottom. © 2020, Pleiades Publishing, Ltd.
Number of references: 21
Main heading: Methanol
Controlled terms: Sodium dodecyl sulfate - Surface properties - Condensation reactions - Sulfur compounds - Acetone - Emulsification - Formaldehyde - Stratigraphy - Salts - Molar ratio
Uncontrolled terms: Aldol reactions - High temperature resistance - Inorganic salts - Methanol concentration - Reaction conditions - Research results - Salt resistance - Surfactant solution
Classification code: 481.1 Geology - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 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 - 951 Materials Science
Numerical data indexing: Mass_Density 1.00e-01kg/m3, Mass_Density 2.00e+02kg/m3, Mass_Density 2.00e-01kg/m3, Percentage 2.00e+01%, Percentage 4.00e-01%, Time 1.80e+03s, Time 4.63e+02s
DOI: 10.1134/S0036024420100106
Funding Details: Number: YCS19111009, Acronym: -, Sponsor: -; Number: 2019ZDLGY06-03, Acronym: -, Sponsor: -; Number: 51774184,41202214, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

146. Effects of pore structures on the movable fluid saturation in tight sandstones: A He8 formation example in Sulige Gasfield, Ordos Basin, China

Accession number: 20201808608126
Authors: Hui, Wei (1, 2); Wang, Yueshe (1); Ren, Dazhong (3); Jin, Hui (1)
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Abstract: A complex pore structure is a crucial factor influencing the movable fluid saturation in tight sandstones, which poses a significant challenge to the exploration and development of the He8 formation in the Sulige Gasfield. To confront this challenge, various experimental methods, including, thin section, scanning electron microscopy (SEM), cathode luminescence (CL), high pressure mercury injection (HPMI), constant rate mercury injection and nuclear magnetic resonance (NMR), were introduced to investigate the factors that affect the movable fluid saturation. The results showed that coarse to medium-grained quartz sandstone and lithic quartz sandstone were the dominant sandstone types. The main pore types were intercrystalline pores and dissolution pores. The mercury injection and NMR test results showed that the pore structure can be divided into three main types with different curve morphologies and different peak amplitudes. The pore structures were highly correlated with movable fluid saturation. Multiple factors were shown to influence the movable fluid saturation, including pore radius, throat radius, pore-throat radius ratio, sorting coefficient, pore mercury saturation and throat mercury saturation. Among these factors, throat radius and pore mercury saturation were dominant in influencing the movable fluid saturation in all three types. The throat mercury saturation had the greatest effect on type 3, demonstrating that the throat volume strongly contributed to the total volume in tight sandstones. The pore-throat radius ratio, and the sorting coefficient, had a degree of influence on the movable fluid saturation. Meanwhile, strong diagenesis was the internal reason for the complex pore structure that further influenced the movable fluid saturation. Mechanical compaction and cementation led to the rearrangement and compactness of detrital grains, which resulted in the reduction of effective space and the decline in the movable fluid saturation. Feldspar dissolution and debris dissolution provided significant storage space and enhanced the seepage capacity. © 2020
Number of references: 44
Main heading: Pore structure
Controlled terms: Nuclear magnetic resonance - Sedimentology - Dissolution - Scanning electron microscopy - Feldspar - Quartz - Sandstone - Mercury (metal) - Structure (composition) - Petroleum prospecting
Uncontrolled terms: Cathode luminescence - Experimental methods - Exploration and development - Feldspar dissolution - High pressure mercury - Intercrystalline pores - Mechanical compaction - Nuclear magnetic resonance(NMR)
Classification code: 481.1 Geology - 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 802.3 Chemical Operations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.petrol.2020.107295
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

147. Exploring the nonlinear association between environmental regulation and carbon intensity in China: The mediating effect of green technology (*Open Access*)

Accession number: 20201308337158
Authors: Yang, Guanglei (1, 2); Zha, Donglan (1, 2); Wang, Xiaojuan (3); Chen, Qian (1, 2)
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Corresponding author: Zha, Donglan(zdl@nuaa.edu.cn)
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Language: English
ISSN: 1470160X
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Environmental regulation and green technology are important to mitigate global warming, whereas few studies explored the role of green technology in environmental regulation on carbon intensity. This paper systematically reviews the literature on the relationship among environmental regulation, green technology, and carbon intensity, and assumes that green technology is a potential mediator of the impact of environmental regulation on carbon intensity. The advanced SBM model and the factor analysis method were performed to measure the relationships. To explore the mediating effect of green technology, the two-step econometric model and the nonlinear mediating effect model were applied to a panel dataset of 30 provinces in China spanning the period 2005–2016. The results show that there is an inverted U-shaped relationship between environmental regulation and green technology, and a U-shaped relationship between environmental regulation and carbon intensity. Green technology has a significant negative impact on carbon intensity. This proves that green technology is an important mediating variable on the relationship between environmental regulation and carbon intensity. Moreover, the current environmental regulation intensity lies before the inflection point of both the inverted U-shaped and the U-shaped curves. The effects of environmental regulation on green technology and carbon intensity in developed and developing regions follow an inverted U-shaped, and a U-shaped curve, respectively. Furthermore, the mediating effect in developing regions is significantly larger than that in developed regions. Finally, policy implications are given to reduce carbon intensity. © 2020
Number of references: 54
Main heading: Environmental technology
Controlled terms: Carbon - Public policy - Environmental regulations - Global warming
Uncontrolled terms: Carbon intensity - Developing regions - Econometric model - Factor analysis method - Green technology - Inflection points - Mediating effect - Policy implications
Classification code: 443.1 Atmospheric Properties - 454 Environmental Engineering - 454.2 Environmental Impact and Protection - 804 Chemical Products Generally - 971 Social Sciences
DOI: 10.1016/j.ecolind.2020.106309
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Open Access type(s): All Open Access, Hybrid Gold
Database: Compendex
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148. A novel polymer-phenolic prepolymer based blocking system for high-temperature and high-salinity oil reservoirs

Accession number: 20204909577742
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Source title: Tenside, Surfactants, Detergents
Abbreviated source title: Tenside Surfactants Deterg
Volume: 57
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Publication year: 2020
Pages: 534-539
Language: English
ISSN: 09323414
CODEN: TSDEES
Document type: Journal article (JA)
Publisher: Carl Hanser Verlag

Abstract: Focusing on the leakage problem in high temperature and high salinity oil fields (reservoir temperature 120°C-130°C, forma- tion water salinity 220000 mg/L), a gel-blocking system is pro- posed using a polymer and a phenolic prepolymer. Specifically, it addresses the short storage time issue of synthetic phenolic prepolymer by introducing p-hydroxybenzoic acid to modify and effectively extend its lifespan. The additional introduction of c-aminopropyl triethoxysilane (KH550) improves the wall-ad- hesion of this system. The proposed gel-blocking system shows good on-site application results in a western China oil field. © 2020 Carl Hanser Verlag. All rights reserved.
Number of references: 15
Main heading: Oil fields
Controlled terms: Monomers - Silicon compounds - Reservoirs (water) - Petroleum reservoir engineering - Petroleum reservoirs
Uncontrolled terms: High temperature - Leakage problems - Novel polymers - P-Hydroxybenzoic acid - Reservoir temperatures - Site application - Triethoxysilane - Water salinity
Classification code: 441.2 Reservoirs - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 804 Chemical Products Generally
Numerical data indexing: Mass_Density 2.20e+02kg/m3, Temperature 3.93e+02K to 2.73e+02K
DOI: 10.3139/113.110706
Funding Details: Number: PLC20190801, Acronym: -, Sponsor: -; Number: 19JK0664, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: YCS18111002, Acronym: -, Sponsor: -; Number: 2019JM-269, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; 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), National Natural Science Foundation of China (51934005), Shaanxi Natural Science Foundation (2019JM-269), Project of Shaanxi Education Department (19JK0664) and Xi'an Shiyou University Graduate Innovation and Practice Ability Development Program Funding (YCS18111002).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

149. Robust extreme learning machine in the presence of outliers by iterative reweighted algorithm

Accession number: 20201208310291
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Article number: 125186
Language: English
ISSN: 00963003
CODEN: AMHCBQ
Document type: Journal article (JA)
Publisher: Elsevier Inc.
Abstract: Extreme learning machine (ELM) is widely used to derive the single-hidden layer feedforward neural networks. However, ELM faces a great challenge in the presence of outliers, which can result in the sensitivity and poor robustness. To overcome this dilemma, a non-convex 2-norm loss function is developed to reduce these negative influences by setting a fixed penalty on any potential outliers. A novel robust ELM is proposed in this paper, and the resultant optimization can be implemented by an iterative reweighted algorithm, called IRRELM. In each iteration, IRRELM solves a weighted ELM. Several artificial datasets, real-world datasets and financial time series datasets are employed in numerical experiments, which demonstrate that IRRELM has superior generalization performance and robustness for modeling datasets in the presence of outliers, especially at the higher outlier levels. © 2020 Elsevier Inc.
Number of references: 28
Main heading: Network layers

Controlled terms: Learning algorithms - Knowledge acquisition - Statistics - Iterative methods - Machine learning - Multilayer neural networks
Uncontrolled terms: Extreme learning machine - Financial time series - Generalization performance - Numerical experiments - Outliers - Real-world datasets - Robust - Single-hidden layer feedforward neural networks
Classification code: 723 Computer Software, Data Handling and Applications - 723.4 Artificial Intelligence - 723.4.2 Machine Learning - 921.6 Numerical Methods - 922.2 Mathematical Statistics
DOI: 10.1016/j.amc.2020.125186
Funding Details: Number: BM2017002, Acronym: -, Sponsor: -; Number: 61833005, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018M642129, Acronym: -, Sponsor: -;
Funding text: The work was supported by the National Science Foundation of China , China under Grant No. 61833005 and 61907033 , the Provincial Key Laboratory, China and Xizang Minzu University, China under Grant No. BM2017002, and the Postdoctoral Science Foundation, China; Jiangsu , China under Grant No. 2018M642129 .
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

150. Electronic and elastic properties of the tetragonal anatase TiO2 structure from first principle calculation

Accession number: 20200708183141
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Corresponding author: Fu, Jia(fujia@xsyu.edu.cn)
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Abbreviated source title: Optik
Volume: 206
Issue date: March 2020
Publication year: 2020
Article number: 164342
Language: English
ISSN: 00304026
Document type: Journal article (JA)
Publisher: Elsevier GmbH
Abstract: Based on the density functional theory (DFT), the band structure, density of state and elastic constants of anatase TiO2 were studied and analyzed by using the Cambridge Sequential Total Energy Package (CASTEP) package. Besides, the mechanical properties, Debye temperature and the tendency of the preferential growth of anatase TiO2 are also studied. The results show that: (1) anatase TiO2 is indirect band gap semiconducting, with a energy gap of 2.116 eV and an obvious electron transfer phenomenon between Ti and O, where the electron distribution has strong localization. (3) Ti-O bond also shows some covalent bond characteristics due to the existence of hybridization. (3) the bulk modulus of elasticity is estimated to be 177.24 GPa, higher than the shear modulus of 42.69 GPa and Young's modulus of 118.54 GPa, showing great anisotropic characteristics. (4) the nanocrystal growth preferentially grows in the edge of the [101] direction in anatase TiO2 structure. As there is less slip system in TiO2,the lack of gliding planes of anatase TiO2 makes it easily to be broken by fracture. The anatase TiO2 has the brittle fracture and poor toughness. As the shear modulus is relatively small, in the anatase TiO2 tetragonal system, this kind of hybrid network structure of ionic bond and covalent bond makes this material show a greater anisotropy. © 2020 Elsevier GmbH
Number of references: 50
Main heading: Density functional theory
Controlled terms: Elasticity - Energy gap - Shear strain - Titanium dioxide - Anisotropy - Elastic moduli - Electronic structure
Uncontrolled terms: Anatase TiO2 - Bond characteristics - Elastic properties - Electron distributions - First principle calculations - Nanocrystal growth - Preferential growth - Strong localizations
Classification code: 804.2 Inorganic Compounds - 922.1 Probability Theory - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science
Numerical data indexing: Electron_Volt 2.12e+00eV, Pressure 1.19e+11Pa, Pressure 1.77e+11Pa, Pressure 4.27e+10Pa

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

151. The role of KCl in cationic Gemini viscoelastic surfactant based clean fracturing fluids

Accession number: 20203909224862
Authors: Yang, Xiaojiang (1); Mao, Jinhua (1); Mao, Jincheng (1); Jiang, Qihui (2); Fu, Meitao (3); Lin, Chong (1); Chen, An (1); Cun, Meng (1); Du, Anqi (1); Xiao, Shuyue (1); Zhao, Jinzhou (1)
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Corresponding author: Mao, Jincheng(jcmao@swpu.edu.cn)
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Abbreviated source title: Colloids Surf. A Physicochem. Eng. Asp.
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Issue date: 5 December 2020
Publication year: 2020
Article number: 125510
Language: English
ISSN: 09277757
E-ISSN: 18734359
CODEN: CPEAEH
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: KCl, as a kind of counter-ion salt, is often used in cationic viscoelastic surfactant (VES) clean fracturing fluid systems. The interaction between Cl- and VES cationic hydrophilic groups is used to promote the formation of VES micelles, which significantly improves the viscoelasticity, temperature resistance, and shear resistance of cationic VES fracturing fluid. At the same time, KCl is also a widely used inorganic salt clay stabilizer. K+ enters the interlayer of the clay and reduces the hydration expansion of clay by charge attraction. To determine whether Cl- and K+ in KCl can simultaneously play the role of counter-ion and clay stabilizer, we have evaluated the performance of KCl on viscoelasticity, temperature, shear resistance of cationic VES fracturing fluid and clay stability. The interaction of KCl and VES in clay stability was also studied. Results revealed that VES thickener has a clay stabilization effect in cationic VES fracturing fluid system, and the higher the concentration, the better the clay stabilization effect. KCl can not only effectively enhance the viscoelasticity and temperature resistance of cationic VES fracturing fluid, showing a counter-ion performance, but also acted as a clay stabilizer. However, VES and KCl can restrain each other in clay stability and produce antagonistic effects. © 2020 Elsevier B.V.
Number of references: 25
Main heading: Fracturing fluids
Controlled terms: Surface active agents - Stabilization - Ions - Micelles - Potassium compounds - Chlorine compounds - Viscoelasticity
Uncontrolled terms: Antagonistic effects - Cationic gemini - Clay stabilization - Clay stabilizers - Hydrophilic groups - Shear resistances - Temperature resistances - Viscoelastic surfactants
Classification code: 801.3 Colloid Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1016/j.colsurfa.2020.125510
Funding Details: Number: G201601, Acronym: -, Sponsor: -; Number: 16CZ0008, Acronym: -, Sponsor: -; Number: 2020YFQ0031, Acronym: -, Sponsor: -; Number: 2017JQ0010, Acronym: -, Sponsor: Sichuan Youth Science and Technology Foundation; Number: 41902303, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019M650250, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: -, Acronym: SWPU, Sponsor: Southwest Petroleum University; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2016ZX05014-005-007,2016ZX05053, Acronym: -, Sponsor: National High-tech Research and Development Program;
Funding text: The research is partly supported by China Postdoctoral Science Foundation (2019M650250), National Natural Science Foundation of China (Grant Nos. 41902303), Sichuan Youth Science & Technology Foundation (2017JQ0010), National High Technology Research & Development Program (2016ZX05053, 2016ZX05014-005-007), Key Fund Project of Educational Commission of Sichuan Province (16CZ0008), the Explorative Project Fund

(G201601) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Southwest Petroleum University) and Sichuan Province Regional Innovation Cooperation Project (2020YFQ0031).The research is partly supported by China Postdoctoral Science Foundation (2019M650250), National Natural Science Foundation of China (Grant Nos. 41902303), Sichuan Youth Science & Technology Foundation (2017JQ0010), National High Technology Research & Development Program (2016ZX05053 , 2016ZX05014-005-007), Key Fund Project of Educational Commission of Sichuan Province (16CZ0008), the Explorative Project Fund (G201601) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Southwest Petroleum University) and Sichuan Province Regional Innovation Cooperation Project (2020YFQ0031).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

152. Permeability enhancement of low rank coal through acidization using H2S solution: An experimental study in the Kuqa-Bay Coalfield, Xinjiang, China

Accession number: 20194307579550
Authors: Wang, Haichao (1); Cheng, Xiaoqian (1); Tian, Jijun (1); Li, Teng (2); Wang, Wenfeng (1); Pan, Jienan (1); Niu, Qinghe (3); Feng, Shuo (1); Hao, Huili (1); Zhang, Yuyao (1)
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Corresponding author: Tian, Jijun(tianxju@yahoo.com)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 185
Issue date: February 2020
Publication year: 2020
Article number: 106476
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Coalbed methane (CBM) wells with abnormally high H2S contents present higher CBM productivity in the low rank coal development areas of Xinjiang, China. The influence of abnormally high H2S contents on the coal reservoir properties is an important research topic. Therefore, acidization experiments using a H2S solution on low rank coal of the Kuqa-Bay coalfield were conducted. The pore structure characteristics and permeability at the horizontal and vertical stratifications were compared before and after the acidization experiments using various methods including X-ray diffraction (XRD), permeability test, high pressure mercury injection porosimetry (HPMIP), and field emission scanning electron microscope (FESEM). The results show that the H2S solution can significantly enhance the permeability of low rank coal. The higher the primary permeability, the greater the permeability amplification would be. The total pore volume (TPV) of the coal increased after the acidization experiment, and the pore distribution and connectivity among micropores, transition pores, and mesopores were also improved. Additionally, the pore volume ratio of the semi-closed pores increased, while that for the macropores showed an opposite trend. The permeability enhancement mechanisms after the H2S solution acidizing experiments indicated that the H2S solution can dissolve the carbonate minerals in the coal, thus, increasing the permeability, and this was considered as a positive permeability enhancement effect. Meanwhile, the clay minerals in the coal expanded with the H2S solution, and this decreased the permeability and was considered a negative permeability enhancement effect. The positive effect precedes the negative effect, leading to an increase in the coal permeability. Additionally, the acidization experiment indicated that the closed pores transform to semi-closed pores, improving the connectivity of the pores and indicating that the permeability of the coal can be further increased. © 2019
Number of references: 51
Main heading: Scanning electron microscopy
Controlled terms: High pressure effects - Coal bed methane - Pore structure - Coal deposits - Methane - Coal
Uncontrolled terms: Coal fields - Field emission scanning electron microscopes - High pressure mercury - Low rank coals - Negative permeability - Permeability enhancement - Structure characteristic - Vertical stratification
Classification code: 503 Mines and Mining, Coal - 512.2 Natural Gas Deposits - 522 Gas Fuels - 524 Solid Fuels - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1016/j.petrol.2019.106476

Funding Details: Number: XJEDU2018Y014, Acronym: -, Sponsor: -; Number: 201604371197,41902171, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: XJU, Sponsor: Xinjiang University; Number: 2018D01C050, Acronym: -, Sponsor: Department of Education, Xinjiang Uygur Autonomous Region; Number: 2017ZX05063002-008, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: 201910755001, Acronym: -, Sponsor: National College Students Innovation and Entrepreneurship Training Program; Number: -, Acronym: -, Sponsor: Natural Science Foundation of Xinjiang;
Funding text: This work was supported by the National Natural Science Foundation of China (201604371197 , 41902171), National Science and Technology Major Project of China (2017ZX05063002-008), Natural Science Foundation of Xinjiang Uygur Autonomous region, China (2018D01C050), Scientific Research Program of the Higher Education Institution of Xinjiang (XJEDU2018Y014), the 2017 PhD research startup foundation of Xinjiang University , and National Training Program of Innovation and Entrepreneurship for Undergraduate (201910755001).This work was supported by the National Natural Science Foundation of China (201604371197, 41902171), National Science and Technology Major Project of China (2017ZX05063002-008), Natural Science Foundation of Xinjiang Uygur Autonomous region, China (2018D01C050), Scientific Research Program of the Higher Education Institution of Xinjiang (XJEDU2018Y014), the 2017 PhD research startup foundation of Xinjiang University, and National Training Program of Innovation and Entrepreneurship for Undergraduate (201910755001).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

153. Nuclear Magnetic Resonance (NMR) mapping of remaining oil distribution during sequential rate waterflooding processes for improving oil recovery

Accession number: 20200908221873
Authors: Wei, Bing (1); Liu, Jiang (1); Zhang, Xiang (1); Xiang, Hua (2); Zou, Peng (1); Cao, Jie (3); Bai, Mingxing (3)
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Corresponding author: Wei, Bing(bwei@swpu.edu.cn)
Source title: Journal of Petroleum Science and Engineering
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Volume: 190
Issue date: July 2020
Publication year: 2020
Article number: 107102
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: At the conclusion of waterflooding phase, significant volume of oil still remains in reservoir formations. In this paper, waterflooding was performed at a designed sequential rate mode with an aim to further reduce the remaining oil saturation (Sor). Waterflooding process was monitored continuously by a low-field Nuclear Magnetic Resonance (NMR) spectrometer attempting to map pore-scale displacing behaviors and also quantify the reduction in Sor in-situ. The results showed that the main pore size of the cores ranged from 1.6 μm to 63.0 μm inferred by T2 (transverse relaxation time) distributions. The value of Sor in the cores increased towards the outlet face during waterflooding because of capillary end effect, which became more significant for heavy oil. At the termination of this waterflooding process, Sor was found to be further reduced by approximately 5.0% in the presence of thief water pathways as a result of the improved viscous forces. Water fingering and capillary imbibition effects were clearly visualized in the NMR images. These observations are expected to be useful for heavy oil waterflooding operations especially in post-breakthrough phase. © 2020 Elsevier B.V.
Number of references: 35
Main heading: Nuclear magnetic resonance
Controlled terms: Petroleum reservoirs - Crude oil - Enhanced recovery - Heavy oil production - Oil well flooding - Pore size
Uncontrolled terms: Capillary imbibition - Enhanced oil recovery - Low field nuclear magnetic resonance - Nuclear magnetic resonance(NMR) - Remaining oil distribution - Remaining oil saturations - Sequential rate mode - Transverse relaxation time
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science

Numerical data indexing: Percentage 5.00e+00%, Size 1.60e-06m to 6.30e-05m
DOI: 10.1016/j.petrol.2020.107102
Funding Details: Number: 51804264,51974265,PLN201909,PLN201912, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017CXTD04, Acronym: SWPU, Sponsor: Southwest Petroleum University; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation;
Funding text: The authors gratefully acknowledge the financial support of National Natural Science Foundation of China (51974265 and 51804264), Open Fund (PLN201909 and PLN201912) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Southwest Petroleum University) and Youth Science and Technology Innovation Team of SWPU (2017CXTD04). The authors also thank the anonymous reviewers for their valuable comments.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

154. Joint estimation of hydraulic and biochemical parameters for reactive transport modelling with a modified ILUES algorithm (*Open Access*)

Accession number: 20203509119009
Authors: Zhang, Ruicheng (1); Zhou, Nianqing (1); Xia, Xuemin (1); Zhao, Guoxian (2); Jiang, Simin (1, 3)
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Corresponding author: Jiang, Simin(jiangsimin@tongji.edu.cn)
Source title: Water (Switzerland)
Abbreviated source title: Water
Volume: 12
Issue: 8
Issue date: August 2020
Publication year: 2020
Article number: 2161
Language: English
E-ISSN: 20734441
Document type: Journal article (JA)
Publisher: MDPI AG, Postfach, Basel, CH-4005, Switzerland
Abstract: Multicomponent reactive transport modeling is a powerful tool for the comprehensive analysis of coupled hydraulic and biochemical processes. The performance of the simulation model depends on the accuracy of related model parameters whose values are usually difficult to determine from direct measurements. In this situation, estimates of these uncertain parameters can be obtained by solving inverse problems. In this study, an efficient data assimilation method, the iterative local updating ensemble smoother (ILUES), is employed for the joint estimation of hydraulic parameters, biochemical parameters and contaminant source characteristics in the sequential biodegradation process of tetrachloroethene (PCE). In the framework of the ILUES algorithm, parameter estimation is realized by updating local ensemble with the iterative ensemble smoother (IES). To better explore the parameter space, the original ILUES algorithm is modified by determining the local ensemble partly with a linear ranking selection scheme. Numerical case studies based on the sequential biodegradation of PCE are then used to evaluate the performance of the ILUES algorithm. The results show that the ILUES algorithm is able to achieve an accurate joint estimation of related model parameters in the reactive transport model. © 2020 by the authors.
Number of references: 60
Main heading: Parameter estimation
Controlled terms: Inverse problems - Iterative methods - Uncertainty analysis - Biodegradation
Uncontrolled terms: Biochemical parameters - Biodegradation process - Comprehensive analysis - Data assimilation methods - Iterative ensemble smoothers - Multicomponent reactive transports - Reactive transport modeling - Reactive transport modelling
Classification code: 461.8 Biotechnology - 801.2 Biochemistry - 921.6 Numerical Methods - 922.1 Probability Theory
DOI: 10.3390/W12082161
Funding Details: Number: 201902020, Acronym: -, Sponsor: Tongji University; Number: 2019nkzd01, Acronym: Hydro-Lab, Sponsor: State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering;
Funding text: Funding: This work was supported by the International Exchange Program for Graduate Students, Tongji University (No. 201902020), and the Belt and Road Special Foundation of the State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering (No. 2019nkzd01).
Compendex references: YES

Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

155. Hydrophobic Modification on the Surface of SiO2Nanoparticle: Wettability Control

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Publisher: American Chemical Society
Abstract: Good control of the morphology, particle size, and wettability of silica nanoparticles is of increasing importance to their use in a variety of fields. Here, we propose a strategy to tune the surface wettability of nanosilica by changing the dosage of a chemical modifier. A series of measurements, including scanning electron microscopy (SEM), laser scatting technique, Fourier transform infrared (FTIR) spectroscopy, thermogravimetry, and surface hydroxyl number and water contact angle measurement, were conducted to verify the surface chemistry and wettability of these nanoparticles. Through controlled chemical modification, the contact angle of the treated nanoparticles increases from 34.7 to 155° with increasing amount of dichlorodimethylsilane (DCDMS) within a molar ratio (MR) between DCDMS and nanoparticles of 5.17. The number of hydroxyl groups covered on the particle surface decreases gradually from 1.79 to 0.47, and the surface grafting rate could reach 73.7%. As the addition of dichlorodimethylsilane equals MR 5.17, the contact angle reaches the maximum value of 155°, which displays excellent superhydrophobicity. After surpassing the point of MR 5.17, the contact angle does not increase but starts to decrease, ultimately remaining stable at 135°. It can be concluded that the surface wettability of nano-SiO2 particles can be precisely modulated by varying the amounts of the modifier. Furthermore, the modulating mechanism of the process occurring on the surface of SiO2 particles has been investigated at the molecular level. © 2020 American Chemical Society.
Number of references: 52
Main heading: Contact angle
Controlled terms: Morphology - Grafting (chemical) - Fourier series - Wetting - Hydrophobicity - Molar ratio - Chemical modification - Fourier transform infrared spectroscopy - Particle size - Silica nanoparticles - Surface morphology - Scanning electron microscopy - SiO2 nanoparticles - Thermogravimetric analysis
Uncontrolled terms: Chemical modifiers - Dichlorodimethylsilane - Hydrophobic modification - Molecular levels - Particle surface - Surface wettability - Water contact angle measurement - Wettability control
Classification code: 761 Nanotechnology - 801 Chemistry - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 921.3 Mathematical Transformations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 7.37e+01%
DOI: 10.1021/acs.langmuir.0c02118
Funding Details: Number: 2014E-3603, Acronym: -, Sponsor: -; Number: 2018JM2011, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2016ZX05056002, Acronym: -, Sponsor: National Science and Technology Major Project; Number: 21773183, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES

Database: Compendex
Data Provider: Engineering Village

156. Green synthesis of ester base oil with high viscosity – Part : Catalyst preparation, characterization, evaluation, and mechanism analysis

Accession number: 20201608435394
Authors: Hu, Shaojian (1); Zhu, Jianhua (1); Wu, Bencheng (1); Ma, Rui (2); Chang, Yuechun (1); Li, Xiaohui (3); Wei, Yuqing (1); Yu, Liujie (1)
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Corresponding author: Zhu, Jianhua(rdcas@cup.edu.cn)
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Publication year: 2020
Article number: 117802
Language: English
ISSN: 00162361
CODEN: FUELAC
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: High viscosity ester base oil, as an eco-friendly lubricant base oil with high performance, can significantly reduce the friction, wear, and energy consumption of large machinery. However, there is less research on the preparation of heterogeneous catalysts for synthesis of high viscosity ester oil. In this work, Sn/Zr mixed oxide catalysts were prepared for the green synthesis of ester base oil with high viscosity. This approach gets rid of additional template, surfactant, organic solvent, sulfur, nitrogen, phosphorus, and halogen, thereby avoiding the potential environmental pollution. A superior powdered catalyst MO-Sn8Zr-9.0-160-18 was developed with optimized Sn/Zr molar ratio, pH, hydrothermal temperature, and hydrothermal time of 8:1, 9.0, 160 °C, and 18 h, respectively. Results of catalyst characterization indicated that the developed catalysts were mesoporous materials with hydrophobic properties, allowing for free diffusion of macromolecules, adsorption of reactants, and desorption of water. Additionally, the specific surface area, pore volume, pore diameter, and surface hydrophobicity of catalyst were enhanced by doping Zr, so the catalysts with higher [Sn/Zr]ICP/[Sn/Zr]XPS exhibited better catalytic activity. Preformed catalyst was prepared by simple mechanical mixing method to achieve better catalyst separation. The specific surface area, acid amount, and acid strength of catalyst were indeed improved significantly after catalyst molding. By programmed heating, the preformed catalyst achieved a maximum carboxyl conversion of 97.2%. Moreover, spent catalyst could be reactivated via solvent washing, drying, calcination, and hydrogen reduction, exhibiting good reusability. © 2020 Elsevier Ltd
Number of references: 43
Main heading: Esters
Controlled terms: Tin compounds - Hydrothermal synthesis - Layered semiconductors - Reusability - Energy utilization - Mesoporous materials - Hydrophobicity - Molar ratio - Catalyst activity
Uncontrolled terms: Catalyst characterization - Environmental pollutions - Heterogeneous catalyst - Hydrophobic properties - Hydrothermal temperature - Mechanical mixing method - Mixed oxide catalysts - Surface hydrophobicity
Classification code: 525.3 Energy Utilization - 712.1 Semiconducting Materials - 801.4 Physical Chemistry - 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
Numerical data indexing: Percentage 9.72e+01%, Temperature 4.33e+02K, Time 6.48e+04s
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Data Provider: Engineering Village

157. Chaos detection and parameters recovery of Duffing oscillator for weak SNR signal while drilling

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Title of translation: SNRDuffing
Authors: Yang, Yi (1); Cheng, Weibin (2); Wang, Yuelong (1); Chen, Jia (1)
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Publication year: 2020
Pages: 235-244
Language: Chinese
ISSN: 02543087
CODEN: YYXUDY
Document type: Journal article (JA)
Publisher: Science Press
Abstract: During the process of drilling, the strong vibration and rapid rotation of bottom drilling tools make the attitude measurement signal contain multi-frequency and high-amplitude interference. The weak original signal amplitude and low signal-to-noise ratio are difficult to be extracted in the field of measurement while drilling. To solve this problem, a Duffing chaotic oscillation detection method for weak signal recognition is proposed in this paper. Firstly, the frequency reconstruction of the measurement signal is realized by scale transformation. In this way, the measured signal can satisfy the restriction of frequency parameters. Then, to solve the influence of the initial phase of the measured signal on the accuracy of the detection model, Duffing oscillator detection model with full phase coverage is achieved by changing the initial phase of the driving signal. Finally, the threshold of Duffing oscillator entering the chaotic state is determined by adjusting the amplitude of the driving signal. The amplitude and phase parameters of the signal are estimated. The test results show that the root mean square error of inclination detected by chaos is 0.69%, and the relative error of the field-drilling is within [10.7%, 20.8%], which are higher than the results of original measurement data and standard Kalman filter. The feasibility and effectiveness of the proposed method has been proved. © 2020, Science Press. All right reserved.
Number of references: 21
Main heading: Parameter estimation
Controlled terms: Mean square error - Infill drilling - Signal detection - Signal to noise ratio - Oscillators (mechanical)
Uncontrolled terms: Attitude measurement - Chaotic oscillation - Field of measurements - Frequency parameters - Low signal-to-noise ratio - Root mean square errors - Scale transformation - Standard Kalman filters
Classification code: 511.1 Oil Field Production Operations - 601.1 Mechanical Devices - 716.1 Information Theory and Signal Processing - 922.2 Mathematical Statistics
Numerical data indexing: Percentage 6.90e-01%
DOI: 10.19650/j.cnki.cjsi.J1905497
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

158. Perfect codes in Cayley sum graphs

Accession number: 20200567892
Authors: Ma, Xuanlong (1); Wang, Kaishun (2); Yang, Yuefeng (3)
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Source title: arXiv
Abbreviated source title: arXiv

Issue date: July 16, 2020
Publication year: 2020
Language: English
E-ISSN: 23318422
Document type: Preprint (PP)
Publisher: arXiv
Abstract: A subset C of the vertex set of a graph Γ is called a perfect code of Γ if every vertex of Γ is at distance no more than one to exactly one vertex in C. Let A be a finite abelian group and T a square-free subset of A. The Cayley sum graph of A with respect to the connection set T is a simple graph with A as its vertex set, and two vertices x and y are adjacent whenever $x + y \in T$. A subgroup of A is said to be a subgroup perfect code of A if the subgroup is a perfect code of some Cayley sum graph of A. In this paper, we give some necessary and sufficient conditions for a subset of A to be a perfect code of a given Cayley sum graph of A. We also characterize all subgroup perfect codes of A.MSC Codes 05C25, 05C69, 94B25 Copyright © 2020, The Authors. All rights reserved.
Number of references: 28
Main heading: Graph Databases
Controlled terms: C (programming language) - Codes (symbols) - Group theory
Uncontrolled terms: Abelian group - Cayley sum graph - Perfect codes - Simple++ - Subgroup perfect code - Vertex set
Classification code: 723.1.1 Computer Programming Languages - 723.2 Data Processing and Image Processing - 723.3 Database Systems - 921.1 Algebra - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
Compendex references: YES
Preprint ID: 2007.08163
Preprint source website: https://arxiv.org
Preprint ID type: ARXIV
Database: Compendex
Data Provider: Engineering Village

159. Viscosity Reduction of Heavy Oil by Ultrasonic

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Authors: Shiyi Lv (1); Peng, Sen (2); Zhang, Rongjun (1); Guo, Zhen (1); Du, Weichao (1, 3); Zhang, Jie (1, 3); Chen, Gang (1, 3)
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Corresponding author: Chen, Gang(gangchen@xsyu.edu.cn)
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Pages: 998-1002
Language: English
ISSN: 09655441
E-ISSN: 15556239
CODEN: PHEME4
Document type: Journal article (JA)
Publisher: Pleiades journals
Abstract: Abstract: In this paper, the effect of ultrasonic wave was evaluated on viscosity and pour point of heavy oil. The effects of time, temperature and power on the viscosity reduction of heavy oil were tested at first. The results showed that ultrasonic wave can reduce the viscosity of the heavy oil from Jinghe Oilfield effectively with the highest viscosity reduction of 87.2%. Then the pour point depressing was evaluated to find the highest pour point depression of 4.8C. Partly recovering of the viscosity after ultrasonic treatment, the paraffin crystal morphology analysis was conducted on the heavy oil to elucidate the mechanism of viscosity reduction and pour point depression. © 2020, Pleiades Publishing, Ltd.
Number of references: 16
Main heading: Viscosity

Controlled terms: Ultrasonic waves - Crude oil - Heavy oil production
Uncontrolled terms: Crystal morphologies - Pour points - Ultrasonic treatments - Viscosity reduction
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 631.1 Fluid Flow, General - 753.1 Ultrasonic Waves - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 8.72e+01%, Temperature 2.78e+02K
DOI: 10.1134/S0965544120090194
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160. A fractal model for gas-water relative permeability curve in shale rocks

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Authors: Li, Ran (1); Chen, Zhangxin (1); Wu, Keliu (1, 2); Liu, Xiong (3); Dou, Liangbin (3); Yang, Sheng (1); Xu, Jinze (1)
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Corresponding authors: Chen, Zhangxin(zhachen@ucalgary.ca); Wu, Keliu(kwu@cup.edu.cn)
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Article number: 103417
Language: English
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Abstract: Initial water content and subsequent fracturing fluid injection lead to gas-water flow in shale nanopores, especially the water-wet pores. But there is few research and experiment to introduce relative permeability curves governing multiphase transport behaviors in shale nanopores. With the consideration of water true slippage and gas slippage, an analytical model illustrating gas-water relative permeability curve in fractal-like tree pore structures has been constructed, aiming to explain gas-water two phase flow behaviors and further evaluate the effects of pore size distributions and water films on gas-water transport. Sensitivity analysis verifies that smaller pore radius, more branching levels and less branching number tend to increase the gas relative flow capacity. Also, ignoring the existence of high-viscosity water molecules has been discovered to reduce water flow resistance. But if the high-viscosity water film loses its mobility, water relative permeability drops slightly. In contrast, mobile bulk water molecules are mainly conducive to increase the gas molecules relative movements. Besides, the analysis of pore size distribution confirms that the fractal-like tree network possesses a more significant gas dominancy compared with log-normal pore network. © 2020 Elsevier B.V.
Number of references: 67
Main heading: Sensitivity analysis
Controlled terms: Hydraulics - Pore size - Gases - Two phase flow - Bubbles (in fluids) - Forestry - Size distribution - Fracturing fluids - Shale gas - Flow of water - Gas permeability - Viscosity - Fractal dimension - Pore structure
Uncontrolled terms: High viscosities - Initial water contents - Multiphase transport - Relative movement - Relative permeability - Relative permeability curves - Significant gas - Water molecule
Classification code: 512.2 Natural Gas Deposits - 522 Gas Fuels - 631.1 Fluid Flow, General - 631.1.1 Liquid Dynamics - 631.1.2 Gas Dynamics - 632.1 Hydraulics - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 921 Mathematics - 922.2 Mathematical Statistics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.jngse.2020.103417

Funding Details: Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: 2204093, Acronym: -, Sponsor: Natural Science Foundation of Beijing Municipality; Number: 2462018YJRC033, Acronym: -, Sponsor: Science Foundation of China University of Petroleum, Beijing;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

161. Visible-light-driven conversion of organic compounds over WO3-based microtubes with mesoporous-walled structure

Accession number: 20201908638274
Authors: Lv, Ying (1, 2); Xu, Zhanglian (3); Du, Lei (1)
Author affiliation: (1) Zhejiang Provincial Research Center of Clothing Engineering Technology, Zhejiang Sci-Tech University, Hangzhou; 310018, China; (2) College of Materials Science and Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (3) School of Nuclear Science and Technology, Xi'An Jiaotong University, Xi'an; 710049, China
Corresponding author: Du, Lei(dulei@zstu.edu.cn)
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Issue date: April 28, 2020
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Language: English
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CODEN: NJCHE5
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Pd-WO3 microtubes with mesoporous-walled structure were prepared through a template-free urea assisted solvothermal method followed by reductive calcination, which demonstrated multifunctional photocatalytic performances depending on the pollutant target, (e.g. complete oxidation of dye molecules, and partial oxidation of propan-2-ol with high selectivity for acetone generation). © 2020 The Royal Society of Chemistry and the Centre National de la Recherche Scientifique.
Number of references: 43
Main heading: Tungsten compounds
Controlled terms: Acetone - Urea - Palladium compounds - Photocatalytic activity
Uncontrolled terms: Complete oxidation - High selectivity - Partial oxidations - Photocatalytic performance - Pollutant targets - Solvothermal method - Template-free - Visible-light-driven
Classification code: 801.4 Physical Chemistry - 804.1 Organic Compounds
DOI: 10.1039/d0nj00196a
Funding Details: Number: 2019FZKKF01, Acronym: -, Sponsor: -; Number: 2017YBZX13, Acronym: -, Sponsor: -; Number: 17072190-Y, Acronym: -, Sponsor: -; Number: LQ19E030021, Acronym: -, Sponsor: Natural Science Foundation of Zhejiang Province; Number: 19JK0654, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Provincial Department of Education;
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Compendex references: YES
Database: Compendex
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162. Numerical investigation on the temperature sensing based on the ?-shaped microfiber resonator

Accession number: 20203909233236
Authors: Xu, Jiayu (1); Xu, Yiping (1); Ren, Liyong (2); Sun, Shuai (1); Jia, Tianxu (1); Zhang, Lei (1); Xiao, Jianting (1); Wang, Bingchuan (1); Ma, Chengju (3); Cheng, Shubo (1); Chen, Fang (1); Song, Feng (1, 4)
Author affiliation: (1) School of Physics and Optoelectronic Engineering, Yangtze University, Jingzhou; 434023, China; (2) School of Physics & Information Technology, Shaanxi Normal University, Xi'an; 710119, China; (3) School of Science, Xi'An Shiyou University, Xi'an; 710065, China; (4) School of Physics, Nankai University, Tianjin; 300071, China
Source title: Journal of Optoelectronics and Advanced Materials
Abbreviated source title: J. Optoelectron. Adv. Mat.
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Issue: 7-8
Issue date: July 2020
Publication year: 2020
Pages: 325-332
Language: English
ISSN: 14544164
Document type: Journal article (JA)
Publisher: National Institute of Optoelectronics
Abstract: In this paper, we propose a temperature sensor based on the ?-shaped microfiber resonator. The numerical researched results indicate that the temperature sensing sensitivity of the resonator is closely related to the microfiber diameter and the external refractive index (ERI), while it has little dependence on other parameters. As the microfiber diameter is 1 μm, it reaches the peak value of 2.09 pm/°C. Additionally, as the ERI increases, it improves gradually, then decreases sharply. When the ERI locates at 1.25 to 1.28, it keeps a constant value of about 2.8 pm/°C. © 2020 National Institute of Optoelectronics. All rights reserved.
Number of references: 39
Main heading: Resonators
Controlled terms: Refractive index - Microfibers - Temperature sensors
Uncontrolled terms: Constant values - External refractive indices - Micro-fiber - Numerical investigations - Peak values - Temperature sensing
Classification code: 741 Light, Optics and Optical Devices - 741.1 Light/Optics - 741.1.2 Fiber Optics - 944.5 Temperature Measuring Instruments
Numerical data indexing: Size 1.00e-06m
Funding Details: Number: 2016CFC767, Acronym: -, Sponsor: -; Number: 61275149,61535015,61605018, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 801080010128, Acronym: YU, Sponsor: Yangtze University; Number: SKLST201612, Acronym: SKLTOP, Sponsor: State Key Laboratory of Transient Optics and Photonics;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

163. Composite sensitivity matrix for reducing the influence of medium electrification on electrical capacitance tomography

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Authors: Tang, Kaihao (1); Hu, Hongli (1); Li, Lin (1); Wang, Xiaoxin (2)

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Corresponding author: Hu, Hongli(hlhu@mail.xjtu.edu.cn)
Source title: IEEE Transactions on Instrumentation and Measurement
Abbreviated source title: IEEE Trans. Instrum. Meas.
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Issue: 4
Issue date: April 1, 2020
Publication year: 2020
Pages: 1159-1169
Article number: 8688448
Language: English
ISSN: 00189456
E-ISSN: 15579662
CODEN: IEIMAO
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: The electrical capacitance tomography (ECT) is an image-based technology which has been widely used for gas-solid two-phase flow measurement. The solid-phase electrification is an inevitable phenomenon during pneumatic conveying. To reduce the influence of medium electrification on the ECT image reconstruction, a composite sensitivity matrix (CSM) which takes into account the effect of charge electrification is developed in this paper, so that the image reconstruction error can be well suppressed. This paper first analyzes how the medium electrification affects ECT sensitivity field from the perspective of electromagnetic theory. The CSM is then derived accordingly. Simulations and physical experiments are carried out to validate the proposed method. The experimental results show that the relative error and the correlative coefficient of the reconstructed images have been significantly improved comparing with that in traditional approaches. The results support the effectiveness of the proposed method. © 1963-2012 IEEE.
Number of references: 28
Main heading: Image reconstruction
Controlled terms: Electric impedance tomography - Electric utilities - Matrix algebra - Two phase flow - Electric fields - Inverse problems - Capacitance - Image enhancement
Uncontrolled terms: Correlative coefficients - Electrical Capacitance Tomography - Electromagnetic theories - Gas solid two phase flow - medium electrification - Physical experiments - Sensitivity coefficient - Traditional approaches
Classification code: 631.1 Fluid Flow, General - 701.1 Electricity: Basic Concepts and Phenomena - 921.1 Algebra
DOI: 10.1109/TIM.2019.2910343
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Funding text: This work was supported in part by the National Natural Science Foundation of China under Grant 51777151, in part by the National Key R&D Program of China under Grant 2016YFB0901200, in part by the Shaanxi Provincial Key Technologies R&D Programme under Grant 2016GY-001, and in part by the Shaanxi Provincial Key Technologies R&D Programme under Grant 2016GY-177.Manuscript received October 11, 2018; revised February 22, 2019; accepted March 1, 2019. Date of publication April 11, 2019; date of current version March 10, 2020. This work was supported in part by the National Natural Science Foundation of China under Grant 51777151, in part by the National Key R&D Program of China under Grant 2016YFB0901200, in part by the Shaanxi Provincial Key Technologies R&D Programme under Grant 2016GY-001, and in part by the Shaanxi Provincial Key Technologies R&D Programme under Grant 2016GY-177. The Associate Editor coordinating the review process was Amitava Chatterjee. (Corresponding author: Hongli Hu.) K. Tang, H. Hu, and L. Li are with the State Key Laboratory of Electrical Insulation and Power Equipment, School of Electrical Engineering, Xi'an Jiaotong University, Xi'an 710049, China (e-mail: mrerr07@stu.xjtu.edu.cn; hlhu@mail.xjtu.edu.cn; ll123xjtu.edu.cn@ stu.xjtu.edu.cn).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

164. Research on the gas refractive index sensing based on microfiber double-knot resonator with a parallel structure

Accession number: 20200207998110

Authors: Sun, Shuai (1); Xu, Yiping (1); Ren, Liyong (2); Xu, Jiayu (1); Jia, Tianxu (1); Zhang, Lei (1); Xiao, Jianting (1); Wang, Bingchuan (1); Yang, Wenxing (1); Cheng, Shubo (1); Chen, Fang (1); Ma, Chengju (3); Song, Feng (1, 4)
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Document type: Journal article (JA)
Publisher: Elsevier GmbH
Abstract: In this paper, we propose a method based on microfiber double-knot resonator with a parallel structure to detect the volume content of the hybrid gases of CO and CO2. The primary principle is that the mixed gases with different volume ratios have different refractive indexes (RIs). The transmission spectrum of the microfiber resonator immersing into the hybrid gases with different volume ratios will produce a spectral drift. The volume content of the mixed gases can be detected using the gas RI sensing method. We present a theoretical study on the influence of different parameters of the microfiber resonator on the gas sensing sensitivity. The observations indicate that the microfiber diameter has the largest impact on the gas sensing sensitivity, while other parameters have negligible effect on it. When the microfiber diameter is 1.0 μm, the maximum sensitivity of 98.4 nm/RIU is obtained. Our results will provide some theoretical guidances for the application of the microfiber resonator in the gas sensing field. © 2020
Number of references: 32
Main heading: Resonators
Controlled terms: Refractive index - Chemical detection - Gas detectors - Gases - Microfibers
Uncontrolled terms: Gas refractive index - Maximum sensitivity - Optical sensing and sensors - Parallel structures - Spectral drifts - Theoretical study - Transmission spectrums - Volume content
Classification code: 741 Light, Optics and Optical Devices - 741.1 Light/Optics - 741.1.2 Fiber Optics - 801 Chemistry - 914.1 Accidents and Accident Prevention - 943.3 Special Purpose Instruments
Numerical data indexing: Size 1.00e-06m
DOI: 10.1016/j.ijleo.2020.164207
Funding Details: Number: 11904032,61535015,61605018, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2016CFC767, Acronym: -, Sponsor: Natural Science Foundation of Hubei Province; Number: -, Acronym: YU, Sponsor: Yangtze University; Number: 801080010128, Acronym: -, Sponsor: Doctoral Scientific Research Start-up Foundation from Henan University of Technology; Number: 2017031,SKLST201612, Acronym: SKLTOP, Sponsor: State Key Laboratory of Transient Optics and Photonics;
Funding text: This work was supported in part by the National Natural Science Foundation of China (NSFC) (61605018, 61535015, 11904032), the Hubei Natural Science Foundation of China (2016CFC767), the Doctoral Scientific Research Startup Foundation of Yangtze University (801080010128), the Open Research Fund of State Key Laboratory of Transient Optics and Photonics (SKLST201612), and the Tenth Innovation Training Program for College Students of Yangtze University (2017031).This work was supported in part by the National Natural Science Foundation of China (NSFC) (61605018 , 61535015 , 11904032), the Hubei Natural Science Foundation of China (2016CFC767), the Doctoral Scientific Research Startup Foundation of Yangtze University (801080010128), the Open Research Fund of State Key Laboratory of Transient Optics and Photonics (SKLST201612), and the Tenth Innovation Training Program for College Students of Yangtze University (2017031).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

165. Numerical simulation of liquid droplet coalescence and breakup

Accession number: 20204009288487
Authors: Yuan, Shuxia (1); Dabirian, Ramin (2); Shoham, Ovadia (2); Mohan, Ram S. (3)
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Language: English
ISSN: 01950738
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CODEN: JERTD2
Document type: Journal article (JA)
Publisher: American Society of Mechanical Engineers (ASME), United States
Abstract: This paper studied the evolution of binary droplet collision in liquid and also a mathematical calculation method of coalescence time. Binary droplet collisions occur in many engineering applications; however, the accurate models to predict the collision of droplets in the liquid are still lacking. In this work, the binary collision processes of droplets were simulated through computational fluid dynamic (CFD) method, where the interfaces between the two phases were tracked by the volume of fluid (VOF) approach. The results reveal that Weber number determines the results of the head-on collisions, and the cases with the same Weber number present similar evolution processes. If coalescence happens, the collision time decreases with increase in relative velocity, whereas the shape recovery time is independent with the relative velocity, but depends on droplet diameter. It is derived from this research that the collision time is proportional to the droplet diameter, and the shape recovery time is proportional to the 3/2 power of droplet diameter. The droplet moving directions play an important role in the collision results, and the case of two droplets moving toward each other with equal velocity is the easiest way to coalesce. When two droplets with different sizes collide, besides relative velocity, the coalescence and breakup are determined by the absolute velocities, the size, and size ratio of the two droplets. The increase in viscosity of continuous phase results an increase in collision time, but decrease in coalescence time. Copyright © 2020 by ASME.
Number of references: 41
Main heading: Coalescence
Controlled terms: Computational fluid dynamics - Drop breakup - Shape optimization - Drop formation - Recovery - Velocity - Liquids
Uncontrolled terms: Absolute velocities - Binary droplet collisions - Coalescence and breakups - Droplet diameters - Engineering applications - Evolution process - Mathematical calculations - Relative velocity
Classification code: 723.5 Computer Applications - 801.3 Colloid Chemistry - 921.5 Optimization Techniques - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1115/1.4046603
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

166. Stable slippery coating with structure of tubes and pyramids for inhibition of corrosion induced by microbes and seawater

Accession number: 20201108295649
Authors: Han, Xiaomei (1); Dou, Wenwen (1, 3); Chen, Shougang (1); Zhu, Shidong (2); Pu, Yanan (1); Li, Hang (1); Wang, Wei (1); Li, Wen (1)
Author affiliation: (1) Department of Materials Science and Engineering, Ocean University of China, Qingdao; 266100, China; (2) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) Shandong Key Laboratory of Corrosion Science, Institute of Oceanology, Chinese Academy of Sciences, Qingdao; 266071, China
Corresponding author: Dou, Wenwen(dww@ouc.edu.cn)
Source title: Surface and Coatings Technology
Abbreviated source title: Surf. Coat. Technol.
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Publication year: 2020
Article number: 125596

Language: English
ISSN: 02578972
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Corrosion induced by microorganisms and seawater can accelerate the failure of metals. To inhibit the corrosion process, in this work, an aluminum oxide coating with tubes-pyramids structure and SLIPS (AO-TP-SLIPS) is fabricated by employing a three-step method, which includes anodizing of Al, fluorination modification and lubricant infusion. To this end, the AO-TP-SLIPS coating affords stable mechanical properties and high corrosion-resistance against microorganisms and seawater. The pyramids structure of the AO-TP-SLIPS surface forms a barrier and slows down the consumption of the lubricant in the tubes, which is one of the key reasons for the improved corrosion resistance. The electrochemical measurements show that the AO-TP-SLIPS coating attains a corrosion current density of 3.39 × 10-12 A cm-2 in Pseudomonas aeruginosa broth and 3.17 × 10-13 A cm-2 in seawater. A high corrosion resistance of the AO-TP-SLIPS specimen retains for 36 days in seawater. This work demonstrates that a composite structure with tubes and pyramids can prolong the service life of coatings in an efficient way, which offers a theory basis for applications of SLIPS in marine environment. © 2020 Elsevier B.V.
Number of references: 63
Main heading: Corrosion resistance
Controlled terms: Composite coatings - Marine applications - Seawater corrosion - Aluminum oxide - Corrosion resistant coatings - Bacteria - Corrosion inhibitors - Aluminum coatings - Alumina - Tubes (components) - Mechanical stability - Aluminum corrosion
Uncontrolled terms: Aluminum oxide coating - Anti-corrosion - Corrosion current densities - Electrochemical measurements - Inhibition of corrosion - Microbiologically induced corrosion - Pseudomonas aeruginosa - Slippery surfaces
Classification code: 471.4 Seawater, Tides and Waves - 539.1 Metals Corrosion - 539.2 Corrosion Protection - 539.2.1 Protection Methods - 541.1 Aluminum - 619.1 Pipe, Piping and Pipelines - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 813.2 Coating Materials
Numerical data indexing: Age 9.86e-02yr
DOI: 10.1016/j.surfcoat.2020.125596
Funding Details: Number: KLCS201903, Acronym: -, Sponsor: -; Number: 51572249,U1806223, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018M640655,2018M640658,2019T120610, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 201813020, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

167. 2D Lanthanide Coordination Polymers: Synthesis, Structure, Luminescent Properties, and Ratiometric Sensing Application in the Hydrostable PMMA-Doped Hybrid Films

Accession number: 20213610848963
Authors: Song, Xue-Qin (1); Meng, Huan-Huan (1); Lin, Zeng-Gang (1); Wang, Li (2, 3)
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Publisher: American Chemical Society
Abstract: Three LnIII coordination polymers [LnL(NO3)3]n·2C4H8O2 (LnL, Ln = Nd, NdL; Eu, EuL; Tb, TbL) based on an asymmetric polymonodentate ligand L, which has abundant branched end groups for chelating LnIII ions and strong light-harvesting ability to sensitize lanthanide luminescence, have been prepared and well characterized. Single-crystal X-ray diffraction studies reveal that they are isomorphic and feature unique undulated two-dimensional (2D) networks where ligand L acted as asymmetric trimonodentate connectors to bind three LnIII ions. Solid-state luminescence determination indicates that TbL emits bright green lights while EuL shows both EuIII-based red emission and L-based blue emission. For EuL, white emission with CIE coordinates of (0.3280, 0.3471) and (0.3441, 0.3236) was obtained upon excitation at 285 and 345 nm, which are close to the NTSC (National Television System(s) Committee) standard value for white emission. In addition, poly(methyl methacrylate) (PMMA) films doped with EuL and TbL (EuL@PMMA and TbL@PMMA) were developed to improve their luminescence performance, thermal stability, and water resistance. With the aid of the PMMA matrix, the emission with the CIE coordinates of (0.3304, 0.3119), which was much closer to the standard white light than that of EuL, resulted when EuL@PMMA was excited at 296 nm. Prominently, both EuL@PMMA and TbL@PMMA exhibited ratiometric emission responses toward Zn2+ selectively in water and could in-site detect Zn2+ to render them as ratio luminescence sensors for Zn2+ in aqueous solution. Copyright © 2020 American Chemical Society.
Number of references: 47
Main heading: Ligands
Controlled terms: Television systems - Chelation - Rare earth elements - Amides - Single crystals - Light - Luminescence - Polymer films - Esters
Uncontrolled terms: Coordination Polymers - Lanthanide coordination polymer - Lanthanide luminescence - Luminescent property - Poly(methyl methacrylate) (PMMA) - Ratiometric sensing - Single-crystal X-ray diffraction studies - Two Dimensional (2 D)
Classification code: 547.2 Rare Earth Metals - 716.4 Television Systems and Equipment - 741.1 Light/Optics - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 815.1 Polymeric Materials - 933.1 Crystalline Solids
Numerical data indexing: Size 2.85e-07m, Size 2.96e-07m, Size 3.45e-07m
DOI: 10.1021/acsapm.0c00052
Funding Details: Number: 21661019, Acronym: NNSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
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168. A modified backward elimination approach for the rapid classification of Chinese ceramics using laser-induced breakdown spectroscopy and chemometrics

Accession number: 20201308342138
Authors: Ruan, Fangqi (1); Hou, Lin (3); Zhang, Tianlong (1); Li, Hua (1, 2)
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Corresponding author: Zhang, Tianlong(tlzhang@nwu.edu.cn)
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E-ISSN: 13645544
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Publisher: Royal Society of Chemistry

Abstract: A modified backward elimination approach was proposed for feature selection (FS) to eliminate the redundant and irrelevant features from laser-induced breakdown spectroscopy (LIBS) spectra for the rapid classification of Chinese archaeological ceramics. The major elements (Fe, Ca, Si, Al and Mg) were identified in the LIBS spectra of the ancient ceramics using the National Institute of Standards and Technology (NIST) database. Six different pre-processing methods were used to reduce the errors caused by random factors and the influence of various non-target factors on the classification results, which could increase the comparability among the Chinese archaeological ceramics from different dynasties. The input features for the random forest (RF) model were selected by a modified backward elimination approach and three assessment criteria, namely sensitivity, specificity and accuracy, from full spectra. LIBS spectra pre-processed by mean centering with the optimal input feature were used to construct an RF classification model for different dynasty ceramics. As indicated by the research results, the sensitivity, specificity and accuracy of the RF model for the ceramic samples in the test set are 0.9526, 0.9910 and 0.9782, respectively. In this sense, available statistics proved the excellent performance of Chinese archaeological ceramic classification. Compared with the predictive result using RF, VI-RF and SBS-RF models, the sensitivity, specificity and accuracy of the modified SBS-RF model are higher than the results by other models. The results demonstrate that the proposed algorithm is more efficient in reducing the redundant features and computational time and improve the model performance. In addition, it is a good alternative for rapid analyses in multivariate classification. This journal is © The Royal Society of Chemistry.
Number of references: 36
Main heading: Decision trees
Controlled terms: Random errors - Computational efficiency - Atomic emission spectroscopy - Laser induced breakdown spectroscopy - Multivariant analysis
Uncontrolled terms: Archaeological ceramics - Backward elimination - Classification models - Classification results - Laserinduced breakdown spectroscopy (LIBS) - Multivariate classification - National Institute of Standards and Technology - Pre-processing method
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922 Statistical Methods - 931.1 Mechanics - 961 Systems Science
DOI: 10.1039/c9ja00371a
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

169. Characteristics and control mechanism of melting process under extra magnetic force fields

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Authors: Dai, Renkun (1, 2); Wu, Yining (1); Mostaghimi, Javad (2); Tang, Linghong (3); Zeng, Min (1)
Author affiliation: (1) Key Laboratory of Thermo-Fluid Science and Engineering, Ministry of Education, Xi'an Jiaotong University, Xi'an; Shaanxi; 710049, China; (2) Centre for Advanced Coating Technologies, University of Toronto, Toronto; M5S 3G8, Canada; (3) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Zeng, Min(zengmin@mail.xjtu.edu.cn)
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Volume: 167
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Article number: 114704
Language: English
ISSN: 13594311
CODEN: ATENFT
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Melting is an essential process in various industrial applications. Effective control and optimization of the melting process are in desperate need. Despite the commonly used control of energy input, extra forces can also produce sophisticated effects on the melting process. This present study aims to investigate the fundamental mechanism of melting control through extra force fields. The extra magnetic force fields are generated by the electrical coils on four different sides of the cavity. The basic melting characteristics are obtained using the enthalpy based lattice Boltzmann method. Results indicate that, when coils are on the bottom or left side, the increase of magnetic force would result in enhancement of the melting process. And it would result in suppression when coils are on the right side. Besides, it would result in suppression first and then enhancement when coils are on the top side, due to the

competition of gravity. The underlying reason is that when coils are set on different sides, the angle between the given temperature gradient and the extra magnetic force varies. Basically it would result in enhancement when the angle increases. Otherwise it would result in suppression. This is the key to achieve different control effects. © 2019 Elsevier Ltd
Number of references: 45
Main heading: Kinetic theory
Controlled terms: Metal melting - Process control - Heat transfer
Uncontrolled terms: Flow and heat transfer - Lattice Boltzmann method - Magnetic force - Melting control - Thermomagnetic convection
Classification code: 641.2 Heat Transfer
DOI: 10.1016/j.applthermaleng.2019.114704
Funding Details: Number: -, Acronym: CSC, Sponsor: China Scholarship Council; Number: 51721004, Acronym: -, Sponsor: Foundation for Innovative Research Groups of Hubei Province of China; Number: 51776157, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Database: Compendex
Data Provider: Engineering Village

170. Conflict analysis under one-vote veto based on approximate three-way concept lattice

Accession number: 20200107982931
Authors: Zhi, Huilai (1); Qi, Jianjun (2); Qian, Ting (3); Ren, Ruisi (4)
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Corresponding author: Qi, Jianjun(qijj@mail.xidian.edu.cn)
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ISSN: 00200255
CODEN: ISIJBC
Document type: Journal article (JA)
Publisher: Elsevier Inc.
Abstract: Conflict analysis, which plays an important role in our society, has attracted more and more attentions. However, the existing conflict analysis models are not effective enough to evaluate the inconsistency degree of cliques that have more than two individuals. Besides, for each clique, its allied, conflict and neutral attributes have not been explicitly defined and thoroughly explored. Therefore, due to the lack of enough explicit clues, we cannot further formulate some strategies manipulating the conflict degrees of related cliques to realize the specific objectives. Last but not least, one-vote veto is seldom considered, although it plays a vital role in many fields, such as venture capital and United Nations Security Council resolutions. In order to solve these problems, we resort to three-way concept analysis and describe a clique by using the intent of a specific concept. On the basis of the obtained specific concepts, we derive the allied, conflict and neutral attributes of cliques, and further make decisions and explore the maximal coalitions and minimum conflict sets. Finally, in order to cater dynamic environment, we also describe an incremental algorithm for conflict analysis. © 2019 Elsevier Inc.
Number of references: 50
Main heading: Investments
Controlled terms: Information analysis
Uncontrolled terms: Approximate three-way concept - Concept analysis - Concept Lattices - Conflict analysis - Dynamic environments - Incremental algorithm - One-vote veto - United nations security councils
Classification code: 903.1 Information Sources and Analysis
DOI: 10.1016/j.ins.2019.12.065

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Funding text: This work was supported by the National Natural Science Foundation of China (Nos. 61502150 , 61772021 , 11801440 and 61976244), the Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-816) and the Innovation Talent Promotion Plan of Shaanxi Province for Young Sci-Tech New Star (Program No.2017KJXX-60).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

171. SiO2 supported highly dispersed Pt atoms on LaNiO3 by reducing a perovskite-type oxide as the precursor and used for CO oxidation

Accession number: 20191606793728
Authors: Zhang, Siran (1, 2); An, Kang (1, 2); Fang, Chunyu (1, 2); Zhang, Ziyang (1, 2); Liu, Qiang (1, 2); Lu, Suhong (3); Liu, Yuan (1, 2)
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Corresponding authors: Liu, Yuan(yuanliu@tju.edu.cn); Lu, Suhong(lusuhong@xsyu.edu.cn)
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CODEN: CATTEA
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: A new facile method for preparing highly dispersed precious metal catalysts was proposed in this work. Highly dispersed Pt supported on LaNiO3/SiO2 were prepared by using LaNi1-xPtxO3 perovskite as precursors. The catalytic performances of CO oxidation over the prepared catalytsts were investigated. The structural features of the catalysts were characterized by N2 adsorption-desorption, XRD, H2-TPR, TEM, EXAFS, CO-TPD and O2-TPD techniques. The result indicated that nanocrystalline of LaNi1-xPtxO3 was supported on SiO2. Reducing LaNi1-xPtxO3/SiO2 could make Pt from the interior of the perovskite crystal lattice onto the surface and then form highly dispersed Pt on the support of LaNiO3/SiO2. As the platinum content was 0.5% or less, platinum atoms could distribute highly even maybe in single atoms. The catalytic test revealed that LaNi0.95Pt0.05O3/SiO2 exhibited a significant activity and stability for CO oxidation, as well as excellent performance in the presence of both 15 vol.% H2O and 12.5 vol.% CO2. It has been demonstrated that the highly dispersed Pt, the easy reducibility, and sufficient surface oxygen species were responsible for the high catalytic activity of LaNi0.95Pt0.05O3/SiO2 catalyst. © 2019 Elsevier B.V.
Number of references: 57
Main heading: Silica
Controlled terms: Nickel compounds - Catalytic oxidation - Lanthanum compounds - Nanocrystals - Platinum compounds - Catalyst activity - Perovskite - Platinum - Atoms
Uncontrolled terms: Catalytic performance - Co oxidation - High dispersion - Perovskite crystal - Perovskite type oxides - Precious metal catalysts - Single atoms - Structural feature
Classification code: 451.2 Air Pollution Control - 482.2 Minerals - 547.1 Precious Metals - 761 Nanotechnology - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 931.3 Atomic and Molecular Physics - 933.1 Crystalline Solids
Numerical data indexing: Percentage 5.00e-01%
DOI: 10.1016/j.cattod.2019.04.041
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

172. Microstructure and phase transformation of IGZO targets with different stoichiometry during sintering

Accession number: 20200308038815
Authors: Qi, Chao (1); Chen, Jie (1); Sun, Benshuang (1); Liu, Shuai (2); Liu, Min (3); Shu, Yongchun (1); He, Jilin (1)
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Language: English
ISSN: 02728842
CODEN: CINNDH
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In this study, indium-gallium-zinc oxide (IGZO) target was synthesized through a pressureless oxygen atmosphere sintering technique, and the effects of chemical stoichiometry and sintering temperature on the IGZO ceramic targets were systematically studied. In2O3, Ga2O3, and ZnO powders in the mole ratio of 1:1:1 and 1:1:4, respectively, were selected as raw materials. After ball milling, green compacts were obtained by granulation and isostatic pressing technology. Then the green compacts were sintered at different temperatures under oxygen atmosphere. The microstructure and phase compositions of the IGZO ceramic targets were analyzed by scanning electron microscopy and X-ray diffraction. In2O3 and ZnGa2O4 phases were observed for the IGZO-111 ceramic at temperatures below 1300 °C. However, single phase of InGaZn2O5 was generated at 1204 °C for the IGZO-114 ceramics and no phase transformation occurred between 1300 and 1500 °C. The IGZO-111 ceramic with lower Zn content was easier to densify; nonetheless, the reaction process was delayed throughout the temperature range. However, the IGZO-114 ceramic with high Zn content exhibited a faster reaction process, but the densification was slower. The IGZO-111 ceramics showed a smaller resistivity of 3.4 m# cm at 1500 °C compared to IGZO-114 ceramics. The perfect microstructure and generation of In2Ga2ZnO7 phase with lower resistivity in the IGZO-111 ceramics contributed to better electrical performance of the IGZO targets. © 2020 Elsevier Ltd and Techna Group S.r.l.
Number of references: 30
Main heading: Microstructure
Controlled terms: Stoichiometry - Sintering - Oxygen - Scanning electron microscopy - Gallium compounds - II-VI semiconductors - Powders - Atmospheric temperature - Zinc oxide - Differential scanning calorimetry - Ball milling - Pressing (forming)
Uncontrolled terms: Chemical stoichiometry - Electrical performance - Indium gallium zinc oxides - Isostatic pressing - Oxygen atmosphere - Reaction process - Sintering temperatures - Temperature range
Classification code: 443.1 Atmospheric Properties - 712.1 Semiconducting Materials - 801.4 Physical Chemistry - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 944.6 Temperature Measurements - 951 Materials Science
Numerical data indexing: Electrical_Resistivity 3.40e-05Ohms*m, Temperature 1.48e+03K, Temperature 1.57e+03K, Temperature 1.57e+03K to 1.77e+03K, Temperature 1.77e+03K
DOI: 10.1016/j.ceramint.2020.01.060
Funding Details: Number: SKL2016K001, Acronym: -, Sponsor: -; Number: 2018M632797, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 192102210014, Acronym: -, Sponsor: Science and Technology Department of Henan Province;

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

173. Reservoir characteristics and evaluation of fluid mobility in organic-rich mixed siliciclastic-carbonate sediments: A case study of the lacustrine Qiketai Formation in Shengbei Sag, Turpan-Hami Basin, Northwest China

Accession number: 20194907789518
Authors: Li, Tianjun (1, 2); Huang, Zhilong (1, 2); Feng, Yue (1); Chen, Xuan (3); Ma, Qiang (3); Liu, Bo (4); Guo, Xiaobo (5)
Author affiliation: (1) State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum, Beijing; 102249, China; (2) College of Geosciences, China University of Petroleum, Beijing; 102249, China; (3) PetroChina Tuha Oilfield Company, Hami; 839009, China; (4) Northeast Petroleum University, Daqing; 163318, China; (5) Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Huang, Zhilong(huangzhilong1962@163.com)
Source title: Journal of Petroleum Science and Engineering
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Language: English
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Publisher: Elsevier B.V., Netherlands
Abstract: Organic matter-rich mixed siliciclastic-carbonate sediments is a special type of tight oil reservoir in the Turpan-Hami basin, which is characterized by complex fluid type, mineral composition and pore structure. By using casting thin sections, scanning electron microscopy (SEM) and whole rock X diffraction (XRD), pore types and petrological characterization of reservoirs are analyzed. Combined with the result of the physical property, nuclear magnetic resonance (NMR) experiments, the effects of the porosity, permeability, and pore size distribution on the movable fluid distribution in the tight reservoir were evaluated. The results showed that there are four types of mixed siliciclastic-carbonate sediments reservoir, which have high TOC. The reservoirs are characterized by low porosity range from 2% to 10% and extra low permeability mainly less than 0.1 × 10-3 μm2. Nanometer scale intergranular pores and micro-fractures were the main reservoir pore types, we further divided the pore sizes distribution into two categories based on their water-saturated NMR T2 spectra: Type I (bimodal pattern) and Type II (left unimodal, micropores with a diameter less than 100 nm). The fluid components in the reservoir including water in nano-pores, movable light oil, non-movable heavy oil and bound water were analyzed using advanced NMR T1-T2 maps. The mobile light oil content in the silt-bearing argillaceous arenaceous limestone and silt-bearing lime micritic dolomite is higher than that of other lithological reservoirs. The movable light oil content exhibited a strong correlation with permeability, and the proportion of large pores, indicating that the large pores, which are mainly supplied by the intergranular pores in dolomite, substantially contributed to mobility of the hydrocarbon fluid. The non-movable heavy oil fluid component is impacted the small pores ratio and solid organic matter, while water the in nano-pores is greatly affected by clay minerals. © 2019 Elsevier B.V.
Number of references: 77
Main heading: Nuclear magnetic resonance
Controlled terms: Petroleum reservoirs - Nuclear magnetic resonance spectroscopy - Scanning electron microscopy - Biogeochemistry - Crude oil - Heavy oil production - Pore size - Pore structure - Dolomite - Petroleum reservoir engineering - Carbonation - Lime - Sediments - Silt - Textures - Lithology
Uncontrolled terms: 2-D NMR - Lithological reservoir - Nuclear magnetic resonance(NMR) - Petrological characterization - Pore distribution - Reservoir characteristic - Siliciclastic carbonates - Turpan-Hami basin
Classification code: 481.1 Geology - 481.2 Geochemistry - 482.2 Minerals - 483 Soil Mechanics and Foundations - 483.1 Soils and Soil Mechanics - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.1 Oil Fields

- 512.1.2 Petroleum Deposits : Development Operations - 801.2 Biochemistry - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 2.00e+00% to 1.00e+01%, Size 1.00e-07m
DOI: 10.1016/j.petrol.2019.106667
Funding Details: Number: 41702127, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: MOST, Sponsor: Ministry of Science and Technology of the People's Republic of China; Number: -, Acronym: CUP, Sponsor: China University of Petroleum, Beijing; Number: -, Acronym: NEPU, Sponsor: Northeast Petroleum University; Number: -, Acronym: SKLMR, Sponsor: State Key Laboratory of Microbial Resources; Number: -, Acronym: -, Sponsor: State Key Laboratory Cultivation Base for Nonmetal Composites and Functional Materials; Number: -, Acronym: -, Sponsor: Science and Technology Department, Heilongjiang Province;
Funding text: This research was supported by State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum (Beijing) and Accumulation and Development of Unconventional Oil and Gas, State Key Laboratory Cultivation Base Jointly-constructed by Heilongjiang Province and Ministry of Science and Technology, Northeast Petroleum University. And thanks to the National Natural Science Foundation of China (No. 41702127). The authors sincerely thank the Tuha Oilfield Company of PetroChina Co. Ltd. for providing the cores for in this study.This research was supported by State Key Laboratory of Petroleum Resources and Prospecting , China University of Petroleum (Beijing) and Accumulation and Development of Unconventional Oil and Gas, State Key Laboratory Cultivation Base Jointly-constructed by Heilongjiang Province and Ministry of Science and Technology , Northeast Petroleum University . And thanks to the National Natural Science Foundation of China (No. 41702127). The authors sincerely thank the Tuha Oilfield Company of PetroChina Co. Ltd. for providing the cores for in this study. Appendix A
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

174. Long-term continuous partial nitritation-anammox reactor aeration optimization at different nitrogen loading rates for the treatment of ammonium rich digestate lagoon supernatant

Accession number: 20203709179376
Authors: Yang, Sen (1); Xu, Shengnan (1); Boiocchi, Riccardo (1); Mohammed, Abdul (1, 2); Li, Xinru (3); Ashbolt, Nicholas J. (4); Liu, Yang (1)
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CODEN: PBCHE5
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Dissolved oxygen (DO) is an important parameter for partial nitritation-anammox process but previously not evaluated for the treatment of digested biosolid thickening lagoon supernatant. Using intermittent aeration we investigated nitrogen removal from such supernatant in an integrated fixed film activated sludge (IFAS) process operated under a variety of hydraulic retention times (1.2–2.5 days). The overall nitrogen removal rate (NRR) was significantly increased (P -3 d-1 at HRT of 2.5 days to 0.50 ± 0.01 kg N m-3 d-1 at HRT of 1.2 day. Higher nitrogen loading rates needed higher DO concentrations in order to cope with the increased oxygen demand by ammonium-oxidizing bacteria (AOB). Enhancing the DO concentration from 0.18 mg L-1 to 0.35 mg L-1 improved AOB activity. However, when the bulk liquid DO was in the range of 0.28-0.35 mg L-1, anammox activity inhibition was observed associated with a significant free nitrous acid (FNA) accumulation (21.70 ± 4.10 μg L-1). Batch studies confirmed the inhibition of anammox activity under high DO conditions (0.28-0.35 mg L-1). Aeration strategies, other than increasing the DO set points, should be investigated in order to be able to work at high nitrogen loading rates without compromising anammox activity. © 2020 Elsevier Ltd
Number of references: 50

Main heading: Dissolved oxygen
Controlled terms: Activated sludge process - Bacteria - Loading - Wastewater treatment - Nitrogen removal
Uncontrolled terms: Aeration strategies - Ammonium oxidizing bacteria - Free nitrous acid (FNA) - Hydraulic retention time - Integrated fixed-film activated sludge - Intermittent aeration - Nitrogen removal rates - Partial nitritation
Classification code: 452.2 Sewage Treatment - 452.4 Industrial Wastes Treatment and Disposal - 691.2 Materials Handling Methods
Numerical data indexing: Age 3.29e-03yr, Mass_Density 1.80e-04kg/m3 to 3.50e-04kg/m3
DOI: 10.1016/j.procbio.2020.08.030
Funding Details: Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: -, Acronym: -, Sponsor: Mitacs; Number: -, Acronym: -, Sponsor: Alberta Innovates;
Funding text: This study was financially supported by the Natural Sciences and Engineering Research Council of Canada (NSERC), Alberta Innovates, Mitacs awards, and EPCOR Water Services Inc. We appreciate Veolia Water Technologies Canada for providing seeding biofilm carriers.This study was financially supported by the Natural Sciences and Engineering Research Council of Canada (NSERC), Alberta Innovates, Mitacs awards , and EPCOR Water Services Inc. We appreciate Veolia Water Technologies Canada for providing seeding biofilm carriers.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

175. Nitrogen-Doped Carbon Nanolayer Coated Hematite Nanorods for Efficient Photoelectrocatalytic Water Oxidation

Accession number: 20202108685659
Authors: Kong, Ting-Ting (1, 2, 3); Huang, Jian (1); Jia, Xin-Gang (1); Wang, Wen-Zhen (1); Zhou, Yong (3); Zou, Zhi-Gang (3)
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Publication year: 2020
Article number: 119113
Language: English
ISSN: 09263373
CODEN: ACBEE3
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: To improve the charge carrier transfer ability in the bulk and at the surface of α–Fe2O3 and accelerate the water oxidation kinetics at the photoanode/electrolyte interface, herein, starting with Ti-doped α–Fe2O3 nanorods, a nitrogen (N) doped carbon (C) nanolayer was coated on the surface of nanorods through a facile hydrothermal method, following a thermal treatment in Ar atmosphere. It was revealed that the N-doped C nanolayer, acting as the passivation layer and/or the water oxidation catalyst, could efficiently extract and collect photoexcited holes from the bulk of α–Fe2O3 and then inject them into the electrolyte for the accelerated water oxidation reaction, by inhibiting both the bulk and surface charge carrier recombination. As a result, the photocurrent density of Ti-doped α–Fe2O3 nanorods coated with N doped C nanolayer was increased by $\sim$2.7 folds at 1.8 V vs. RHE, as compared with the pristine one. © 2020 Elsevier B.V.
Number of references: 59
Main heading: Carbon
Controlled terms: Doping (additives) - Electrolytes - Nanorods - Nitrogen - Charge carriers - Oxidation - Hematite - Passivation
Uncontrolled terms: Charge carrier recombination - Charge carrier transfer - Hydrothermal methods - Nitrogen-doped carbons - Photocurrent density - Photoelectrocatalytic - Photoexcited holes - Water oxidation catalysts

Classification code: 482.2 Minerals - 539.2.1 Protection Methods - 701.1 Electricity: Basic Concepts and Phenomena - 702 Electric Batteries and Fuel Cells - 761 Nanotechnology - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 933 Solid State Physics
DOI: 10.1016/j.apcatb.2020.119113
Funding Details: Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 51902253, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

176. Oil recovery and compositional change of CO2 huff-n-puff and continuous injection modes in a variety of dual-permeability tight matrix-fracture models

Accession number: 20202008657946
Authors: Wei, Bing (1); Zhong, Mengying (1); Gao, Ke (1); Li, Xiang (3); Zhang, Xiang (1); Cao, Jie (2); Lu, Jun (3)
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Corresponding author: Wei, Bing(bwei@swpu.edu.cn)
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Publication year: 2020
Article number: 117939
Language: English
ISSN: 00162361
CODEN: FUELAC
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: CO2 offers potential for improving oil recovery of unconventional reservoirs. There is, however, a lack of understanding of mass transport in matrix-facture systems during CO2 injection to simulate hydraulically fractured formations. To bridge the gaps, three dual-permeability tight matrix-fracture models were designed and employed to mimic CO2 huff-n-puff (HnP) and continuous injection (CI). Fracture aperture (h) and fracture permeability (Kf) of the models with confining pressure were firstly correlated, after which CO2 HnP and CI were performed to observe the variations of system pressure (Psys) and oil recovery factor (ORF) over time. Our results indicated that either CO2 HnP or CI could substantially recover the matrix oil, and an ORF up to 53.28% OOIP (original oil in place) was produced by the CI mode. However, the ORF was found to rapidly decline with cycle number or time. The mass transport of these two modes was dictated by both diffusion and advection. Light hydrocarbons (HCs) extraction/vaporization promoted the mass exchange between fracture and matrix, which, therefore, increased the ultimate ORF. Surface area exposure was the decisive factor to the ORF of CO2 injection and other similar methods followed by fluid conductivity. The results of this study supplement earlier findings and can provide insights into the oil recovery mechanisms of CO2 injection in tight reservoirs. © 2020 Elsevier Ltd
Number of references: 39
Main heading: Carbon dioxide
Controlled terms: Bridges - Petroleum reservoir engineering - Enhanced recovery - Fracture - Petroleum reservoirs
Uncontrolled terms: Compositional changes - Confining pressures - Continuous injections - Fracture permeability - Fractured formations - Oil recovery mechanisms - Original oil in places - Unconventional reservoirs
Classification code: 401.1 Bridges - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 804.2 Inorganic Compounds - 951 Materials Science
Numerical data indexing: Percentage 5.33e+01%
DOI: 10.1016/j.fuel.2020.117939

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

177. Growth and metabolism of an aerobic thermophilic Geobacillus strain under simulated composite extreme reservoir conditions (*Open Access*)

Accession number: 20204309381293
Authors: Wang, Junqi (1, 2); Kong, Xiangping (1, 3)
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Document type: Conference article (CA)
Conference name: 2020 6th International Conference on Energy Science and Chemical Engineering, ICESCE 2020
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Conference location: Dali, China
Conference code: 163712
Publisher: IOP Publishing Ltd
Abstract: The growth and metabolism of an aerobic thermophilic Geobacillus strain DM-2 under simulated composite extreme conditions of the Ng3, Gudao Block, Shengli Oilfield (China) with sufficient oxygen and nutrition were investigated. The experimental device for simultaneously simulating the temperature, pressure, salinity, porosity, permeability, fluid characteristics and development status of the target reservoir was designed, where the air assisted flooding technology was used. Particularly, the oxygen demand was estimated according to biotic and abiotic oxygen consumption. Despite the relatively lower rates of microbial growth and metabolism, the strain was able to grow under these conditions with the cell density increased from 106 to 108 cellsmL-1, and CH3COO- produced at the concentration of about 400 mg . L-1. Aerobic microorganisms, such as Geobacillus sp., may be promising candidates for microbial enhanced oil recovery and oily sewage treatment technology. © Published under licence by IOP Publishing Ltd.
Number of references: 11
Main heading: Oxygen
Controlled terms: Environmental management - Metabolism - Oil well flooding - Air - Petroleum reservoir engineering - Reservoirs (water) - Enhanced recovery
Uncontrolled terms: Aerobic microorganisms - Aerobic thermophilic - Experimental devices - Extreme conditions - Microbial enhanced oil recoveries - Oxygen consumption - Reservoir conditions - Treatment technologies
Classification code: 441.2 Reservoirs - 454.1 Environmental Engineering, General - 454.2 Environmental Impact and Protection - 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 804 Chemical Products Generally
DOI: 10.1088/1755-1315/565/1/012047

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Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

178. A 3D Cu(ii) tetrazolate coordination polymer based on pentanuclear units with a large coercive field

Accession number: 20200508091564
Authors: Sun, Wu-Juan (1); Li, Lei-Lei (1); Liu, Xiang-Yu (2); Liu, Shuang (1); Ke, Cong-Yu (1); Zhang, Qun-Zheng (1); Zhang, Xun-Li (1)
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Corresponding author: Zhang, Xun-Li(xlzhang@xsyu.edu.cn)
Source title: Dalton Transactions
Abbreviated source title: Dalton Trans.
Volume: 49
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Issue date: 2020
Publication year: 2020
Pages: 651-658
Language: English
ISSN: 14779226
E-ISSN: 14779234
CODEN: DTARAF
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A novel 3D coordination polymer {[Cu4.5 (BTZE)1.5 (μ3-OH)3(μ-OH)(SO4)(H2O)1.5·4H2O]}n (1) was synthesized by a solvothermal reaction of 1,2-bis(tetrazol-5-yl) ethane (BTZE) with copper sulfate. Compound (1) contained triangular [Cu3(μ3-OH)] cluster based magnetic Δ–chains linked with in situ generated μ2-BTZE ligands to form a 2D cyclic annular layer. This 2D layer structure was further modified with sulfate and symmetry-related μ3-OH groups, extending to a 3D coordination framework structure. The magnetic performance of (1) was characterized in the temperature range of 2-300 K in terms of direct-current and alternating-current magnetic susceptibilities, revealing that (1) was a canted ferromagnet with a critical temperature (Tc) of 9.5 K. Notably, (1) behaved as a hard magnet with a coercive field of 2.3 kOe at 2 K, showing significant unique characteristics compared to those of the reported spin canting systems based on pure Cu(ii) ions. © 2020 The Royal Society of Chemistry.
Number of references: 58
Main heading: Copper compounds
Controlled terms: Magnets - Coordination reactions - Sulfur compounds - Magnetic susceptibility - Coercive force - Magnetism
Uncontrolled terms: 3D coordination - Alternating current - Coordination Polymers - Critical temperatures - Direct current - Magnetic performance - Solvothermal reactions - Temperature range
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 802.2 Chemical Reactions
Numerical data indexing: Temperature 2.00e+00K, Temperature 2.00e+00K to 3.00e+02K, Temperature 9.50e+00K
DOI: 10.1039/c9dt04113c
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

179. Research on high temperature thermal stability and safety of two types of composite inorganic phase change thermal storage materials

Accession number: 20204809532776
Title of translation:
Authors: Liu, Liang (1, 2); Wu, Aizhi (1); Huang, Yun (2); Huang, Jian (3)
Author affiliation: (1) Beijing Academy of Safety Science and Technology, Beijing; 101101, China; (2) State Key Laboratory of Multiphase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences, Beijing; 100190, China; (3) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Liang(liuliang8@126.com)
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Abbreviated source title: Huagong Xuebao
Volume: 71
Issue date: October 2020
Publication year: 2020
Pages: 314-320
Language: Chinese
ISSN: 04381157
CODEN: HUKHAI
Document type: Journal article (JA)
Publisher: Materials China
Abstract: In this paper, nitrate (KNO3, NaNO3) and carbonate (Li2CO3, K2CO3, Na2CO3 and CaCO3), which are composite inorganic phase change thermal storage materials suitable for industrial thermal storage, non-toxic and less corrosive, are used as phase change components, respectively. The thermal properties (melting point, latent heat) of 4 different ratios of nitrate phase change components and 6 different ratios of carbonate phase change components were studied, and a distribution ratio of molten salt phase change components was selected respectively. Using the principle of porous carrier adsorption, two types of composite molten salt thermal storage materials with the best ratio were prepared. The ease of decomposition of the thermal storage materials in different media atmospheres (Ar and air) was analyzed. TG-DSC-MS tested high temperature thermal decomposition products show that the composite nitrate thermal storage materials have stable physical and chemical properties and good safety when storing thermal at medium temperature (300), but they are easy to decompose NO and high temperature (500) or higher. NO2 and air atmosphere are more likely to generate toxic gases, and composite carbonate thermal storage materials are more likely to generate CO in air than Ar, which affects the safety of the thermal storage process. © 2020, Editorial Board of CIESC Journal. All right reserved.
Number of references: 30
Main heading: Thermolysis
Controlled terms: Molten materials - Fused salts - Storage (materials) - Sodium nitrate - Phase change materials - Potash - Carbonation - Heat storage - Lithium compounds - Toxic materials - Calcite - Nitrates - Calcium carbonate - Sodium Carbonate - Potassium Nitrate
Uncontrolled terms: Composite carbonates - Distribution ratio - High temperature thermal-stability - Medium temperature - Molten salt thermal storage - Phase-change thermal storages - Physical and chemical properties - Thermal decomposition products
Classification code: 482.2 Minerals - 694.4 Storage - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds
DOI: 10.11949/0438-1157.20200355
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

180. Multiple-Transmit Focusing for the Nondestructive Testing of Downhole Casings Based on Borehole Transient Electromagnetic Systems (*Open Access*)

Accession number: 20205109648699
Authors: Liu, Changzan (1); Dang, Bo (2); Wang, Haiyan (1); Shen, Xiaohong (1); Yang, Ling (2); Ren, Zhiping (2); Dang, Ruirong (2); Kang, Yuzhu (1); Sun, Baoquan (3)
Author affiliation: (1) School of Marine Science and Technology, Northwestern Polytechnical University, Xi'an; 710072, China; (2) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, Xi'an Shiyou University, Xi'an; 710065, China; (3) Petroleum Engineering Technology Research Institute, Shengli Oilfield Company, Sinopec, Dongying; 257000, China
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Abbreviated source title: IEEE Access
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Publication year: 2020
Pages: 210978-210987
Article number: 9258894
Language: English
E-ISSN: 21693536
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Borehole transient electromagnetic (TEM) array has proven to be efficient for the downhole nondestructive testing (NDT) of metal casings through the eddy-current property. However, restricted by bad downhole conditions, the simple increase of the receiving array is not sufficient enough for improving the downhole NDT performance. In this paper, we present a multiple-transmit focusing (MTF)-based borehole TEM system for the NDT of downhole casings. On the basis of the borehole TEM signal model, the response of the multiple-transmit array is derived by employing the matrix form of the borehole TEM response. It was shown that the excited magnetic field by the multiple-transmit array can be focused by weighting the current of each transmitter. Using this property, a modified linear constrained minimum variance-based multiple-transmitting array weighting method was proposed to realize the MTF. Moreover, a subarray partition approach was proposed to simplify the MTF realization, where the subarray weighting and mean square error were also analyzed. The MTF method performance was verified by applying it to a borehole TEM system for the NDTs of downhole casings. Finally, simulations and experiments were conducted, and the results demonstrated the effectiveness of the proposed method. © 2013 IEEE.
Number of references: 32
Main heading: Transient analysis
Controlled terms: Boreholes - Eddy current testing - Focusing - Mean square error
Uncontrolled terms: Downhole conditions - Linear constrained minimum variances - Multiple transmit - Receiving arrays - Signal modeling - Transient electromagnetic systems - Transient electromagnetics - Weighting methods
Classification code: 922.2 Mathematical Statistics
DOI: 10.1109/ACCESS.2020.3037944
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

181. Over 20% Efficiency in Methylammonium Lead Iodide Perovskite Solar Cells with Enhanced Stability via "in Situ Solidification" of the TiO2 Compact Layer (*Open Access*)

Accession number: 20201008267277
Authors: Li, Yan (1); Hoye, Robert L. Z. (2); Gao, Huan-Huan (1); Yan, Lihe (3); Zhang, Xiaoyong (1); Zhou, Yong (1); MacManus-Driscoll, Judith L. (2); J., Gan
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Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: In methylammonium lead iodide (MAPbI3) perovskite solar cells (PSCs), the device performance is strongly influenced by the TiO2 electron transport layer (ETL). Typically, the ETL needs to simultaneously be thin and pinhole-free to have high transmittance and avoid shunting. In this work, we develop an "in situ solidification" process following spin coating in which the titanium-based precursor (titanium(diisopropoxide) bis(2,4-pentanedionate)) is dried under vacuum to rapidly achieve continuous TiO2 layers. We refer to this as "gas-phase quenching". This results in thin (60 ± 10 nm), uniform, and pinhole-free TiO2 films. The PSCs based on the gas-phase quenched TiO2 exhibits improved power conversion efficiency, with a median value of 18.23% (champion value of 20.43%), compared to 9.03 and 14.09% for the untreated devices. Gas-phase quenching is further shown to be effective in enabling efficient charge transfer at the MAPbI3/TiO2 heterointerface. Furthermore, the stability of the gas-phase quenched devices is enhanced in ambient air as well as under 1 sun illumination. In addition, we achieve 12.1% efficiency in upscaled devices (1.1 cm2 active area). © 2020 American Chemical Society.
Number of references: 69
Main heading: Perovskite solar cells
Controlled terms: Electron transport properties - Layered semiconductors - Solar power generation - Lead compounds - Perovskite - Quenching - Phase interfaces - Gases - Charge transfer - Iodine compounds - Titanium dioxide - Efficiency
Uncontrolled terms: Device performance - Electron transport layers - Enhanced stability - High transmittance - Interface charge - Lead iodide - Photovoltaics - Power conversion efficiencies
Classification code: 482.2 Minerals - 537.1 Heat Treatment Processes - 615.2 Solar Power - 702.3 Solar Cells - 712.1 Semiconducting Materials - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 913.1 Production Engineering
Numerical data indexing: Area 1.10e-04m2, Percentage 1.21e+01%, Percentage 1.41e+01%, Percentage 1.82e+01%, Percentage 2.00e+01%, Percentage 2.04e+01%, Percentage 9.03e+00%
DOI: 10.1021/acsami.9b19153
Funding Details: Number: 2019JQ-286, Acronym: -, Sponsor: -; Number: -, Acronym: -, Sponsor: Royal Academy of Engineering; Number: 11674260, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018M640906, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 19JK0660, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: Research funding from the National Science Foundation of Shaanxi Province (no. 2019JQ-286) and the Scientific Research Program of Shaanxi Education Department (no. 19JK0660) are greatly acknowledged by the authors. J.G. acknowledges the funding from the China Postdoctoral Science Foundation through the project (no. 2018M640906). J.L.M.-D. acknowledges the Winton Programme for the Physics of Sustainability and funding from Bill Welland. R.L.Z.H. acknowledges funding from the Royal Academy of Engineering through the Research Fellowships scheme (no. RF20171817101) as well as from the Isaac Newton Trust (Minute 19.07(d)). L.Y. acknowledges the funding from National Natural Science Foundation of China (no. 11674260). X.Z. acknowledges funding for the provincially advanced subject of Materials Science and Engineering at Xi'an Shiyou University in Shaanxi (no. YS37020203).
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182. Inter-well interferences and their influencing factors during water flooding in fractured-vuggy carbonate reservoirs

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Title of translation:
Authors: Wang, Jing (1, 2); Zhao, Wei (1, 2); Liu, Huiqing (1, 2); Liu, Fangna (1, 2); Zhang, Tuozheng (1, 2); Dou, Liangbin (1, 3); Yang, Xinling (4); Li, Bo (4)
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Source title: Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development
Abbreviated source title: Shiyou Kantan Yu Kaifa
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Pages: 990-999 and 1051
Language: Chinese
ISSN: 10000747
CODEN: SKYKEG
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Based on the characteristics of injection-production units in fractured-vuggy carbonate reservoirs, nine groups of experiments were designed and performed to analyze the interference characteristics and their influencing factors during water flooding. Based on percolation theory, an inversion model for simulating waterflooding interferences was proposed to study the influence laws of different factors on interference characteristics. The results show that well spacing, permeability ratio, cave size, and cave location all affect the interference characteristics of water flooding. When the cave is located in high permeability fractures, or in the small well spacing direction, or close to the producer in an injection-production unit, the effects of water flooding are much better. When the large cave is located in the high-permeability or small well spacing direction, the well in the direction with lower permeability or smaller well spacing will see water breakthrough earlier. When the cave is in the higher permeability direction and the reserves between the water injector and producer differ greatly, the conductivity differences in different injection-production directions are favorable for water flooding. When the injection-production well pattern is constructed or recombined, it's better to make the reserves of caves in different injection-production directions proportional to permeability, and inversely proportional to the well spacing. The well close to the cave should be a producer, and the well far from the cave should be an injector. Different ratios of cave reserves to fracture reserves correspond to different optimal well spacings and optimal permeability ratios. Moreover, both optimal well spacing and optimal permeability ratio increase as the ratio of cave reserves to fracture reserves increases. © 2020, The Editorial Board of Petroleum Exploration and Development. All right reserved.
Number of references: 12
Main heading: Floods
Controlled terms: Caves - Oil well flooding - Fracture - Petroleum reservoirs - Injection (oil wells) - Petroleum reservoir engineering - Reservoirs (water) - Solvents - Well spacing
Uncontrolled terms: High permeability - Inter-well interference - Interference characteristics - Inversion models - Percolation theory - Permeability ratio - Production wells - Water breakthrough
Classification code: 441.2 Reservoirs - 481.1 Geology - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 803 Chemical Agents and Basic Industrial Chemicals - 951 Materials Science
DOI: 10.11698/PED.2020.05.13
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

183. Investigation on geothermal water reservoir development and utilization with variable temperature regulation: A case study of China

Accession number: 20202508852084
Authors: Fan, Huifang (1); Zhang, Luyi (1); Wang, Ruifei (2); Song, Hongqing (1); Xie, Hui (1); Du, Li (3); Sun, Pengguang (3)
Author affiliation: (1) School of Civil and Resource Engineering, University of Science and Technology Beijing, 30 Xueyuan Rd, Beijing; 100083, China; (2) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) Sinopec Star Petroleum Co., Ltd, 263 N 4th Ring Road Middle, Beijing; 100083, China
Corresponding author: Song, Hongqing(songhongqing@ustb.edu.cn)
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Publication year: 2020
Article number: 115370

Language: English
ISSN: 03062619
CODEN: APENDX
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Geothermal heating technology is an important technique for alleviation of energy crisis and environmental pollution. A numerical simulation and multi-objective optimisation for geothermal heating systems are conducted considering factors such as the heating load, heating modes, and region characteristics. Heating modes play a vital role in the utilization of geothermal reservoirs. It is found that regulated geothermal heating system can postpone the formation of thermal breakthroughs and shrink radius of the cold front. It's also indicated that well spacing and production rate are the two main factors affecting the production performance and emission reduction of geothermal heating systems. Construction investment of geothermal wells and the annual water consumption of regulated geothermal heating system decreases by up to 30% and 60%, comparing with unregulated geothermal heating system, although electricity costs increase by 5% to 25%. Multi-objective optimized heating system parameters for Qingfeng project in China are achieved. The best regulated geothermal heating system with well spacing of 295 m and production rate of 100 m3/h generates the highest efficiencies in terms of heat production, emission reduction, and economic performance. The mathematical model and multi-objective optimization model can provide references for utilization of geothermal heating technology in other places with similar conditions. © 2020 Elsevier Ltd
Number of references: 41
Main heading: Multiobjective optimization
Controlled terms: Geothermal wells - Reservoirs (water) - Energy policy - Environmental technology - Heating equipment - Costs - Well spacing - District heating - Geothermal fields - Emission control - Investments
Uncontrolled terms: Annual water consumption - Construction investments - Environmental pollutions - Geothermal heating systems - Multi-objective optimization models - Production performance - Region characteristics - Reservoir development
Classification code: 441.2 Reservoirs - 451.2 Air Pollution Control - 454 Environmental Engineering - 481.3.1 Geothermal Phenomena - 525.6 Energy Policy - 615.1 Geothermal Energy - 643.1 Space Heating - 911 Cost and Value Engineering; Industrial Economics - 921.5 Optimization Techniques
Numerical data indexing: Percentage 3.00e+01%, Percentage 5.00e+00% to 2.50e+01%, Percentage 6.00e+01%, Size 2.95e+02m
DOI: 10.1016/j.apenergy.2020.115370
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184. Metallic Support for Direct-CH4 Solid Oxide Fuel Cell

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Title of translation: CH4
Authors: Li, Kai (1); Gao, Wenming (1); Du, Ying (2); Li, Jian (3)
Author affiliation: (1) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Army Unit 66389, Xi'an; 710061, China; (3) Center for Fuel Cell Innovation, State Key Laboratory for Materials Processing and Die & Mould Technology, School of Materials Science and Engineering, Wuhan; 430074, China
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Language: Chinese
ISSN: 1005023X
Document type: Journal article (JA)
Publisher: Cailiao Daobaoshe/ Materials Review

Abstract: Metal support solid oxide fuel cells (MS-SOFC) resembles with conventional solid oxide fuel cells in materials and fabrication schemes, with main difference being loading bear component. MS-SOFC relies heavily on porous metallic supporting structure, and offers competitive advantages such as low materials cost, high tolerance towards rapid thermal cycling, excellent structural robustness and sealing efficiency. However, MS-SOFC remains many major challenges in support materials, cell preparation and fuel selection due to the distinct physical and chemical pro-perties in metal and ceramic materials. For recent research on MS-SOFC, in addition to the metal support materials and preparation process, efforts have been made to prepare the anode function layer, electrolyte and cathode on the metal substrate by thin file technology and continually optimize preparation process of MS-SOFC according to the different microstructure for porous electrode and dense electrolyte. For directly using CH4 based fuel in MS-SOFC, nano-structured metallic support are prepared by infiltrating nano catalytic particles into metal support to improve CH4 reforming activity and carbon resistance. In addition, an extra layer with high catalytic activity is applied on the metallic support to on-cell reform the hydrocarbon fuel and improve the stability of CH4 fueled MS-SOFC. The objective of this article is to provide a critical and comprehensive review in the recent development of MS-SOFC, metallic support materials and fabrication process, as well as the key issue in direct CH4 MS- SOFC. The issues raised by MS-SOFC fabrication process are also presented and analyzed to provide some guidelines in the search for new fabrication schemes for MS-SOFC. Emphasis will be placed on Ni-Fe alloy support SOFC with CH4 fuel. The methods of enhancing the catalytic activity of metal support are proposed according to the characters of metal support. Finally, the development trends of metal support for direct methane SOFC are discussed. © 2020, Materials Review Magazine. All right reserved.
Number of references: 58
Main heading: Solid oxide fuel cells (SOFC)
Controlled terms: Catalyst activity - Fabrication - Metals - Nickel alloys - Binary alloys - Cerium oxide - Solid electrolytes - Methane - Competition - Iron alloys
Uncontrolled terms: Carbon resistances - Catalytic particles - Competitive advantage - Fabrication process - Preparation process - Rapid thermal cycling - Structural robustness - Supporting structure
Classification code: 545.2 Iron Alloys - 548.2 Nickel Alloys - 702.2 Fuel Cells - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 911.2 Industrial Economics
DOI: 10.11896/cldb.19120197
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

185. pH and temperature-responsive POSS-based poly(2-(dimethylamino)ethyl methacrylate) for highly efficient Cr(VI) adsorption

Accession number: 20203609121890
Authors: Huang, Hai (1); Ren, Dazhong (1); Qu, Jia (2)
Author affiliation: (1) Engineering Research Center of Development and Management for Low to Ultra-Low Permeability Oil & Gas Reservoirs in West China, Ministry of Education, Xian Shiyou University, Xian; Shaanxi; 710065, China; (2) Shaanxi Key Laboratory of Comprehensive Utilization of Tailings Resources, Shaanxi Engineering Research Center for Mineral Resources Clean & Efficient Conversion and New Materials, Shangluo University, Shangluo; Shaanxi; 726000, China
Corresponding authors: Ren, Dazhong(petro_gas@163.com); Qu, Jia(qj0424@126.com)
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Abbreviated source title: Colloid Polym. Sci.
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Language: English
ISSN: 0303402X
E-ISSN: 14351536
CODEN: CPMSB6
Document type: Journal article (JA)
Publisher: Springer Science and Business Media Deutschland GmbH
Abstract: Sixteen-arm star-shaped polymer of s-POSS-(PDMAEMA)16 was synthesized by octakis(dibromoethyl) polyhedral oligomeric silsesquioxane (POSS-(Br)16) initiating 2-(dimethylamino)ethyl methacrylate (DMAEMA) via atom transfer radical polymerization (ATRP) process. The obtained s-POSS-(PDMAEMA)16 showed controllable and reversible pH-responsive behavior at pH = 112 and thermoresponsive behavior at 2060°C. Typical core/shell micelles (100130nm) were formed by s-POSS-(PDMAEMA)16 at pH = 7.8 and transformed into 450600nm snowflake-shaped micelles at pH = 6, 400nm butterfly-shaped micelles at pH = 3, and 2040nm spherical particles at pH = 10 due to the different interactions between the PDMAEMA chains and the aqueous solution. When the pH of the solution decreased from 10 to 3, 350400nm butterfly-shaped micelles were reformed, demonstrating the reversibility of this process. The soluble-insoluble transition temperature for s-POSS-(PDMAEMA)16 was located between 20 and 60°C. Furthermore, equilibrium adsorption indicated that s-POSS-(PDMAEMA)16 could adsorb Cr(VI) due to strong electrostatic interactions between its tertiary amines and Cr(VI). © 2020, Springer-Verlag GmbH Germany, part of Springer Nature.
Number of references: 44
Main heading: Micelles
Controlled terms: Chromium compounds - Adsorption - Temperature - Amines - Atom transfer radical polymerization - Electrostatics
Uncontrolled terms: 2-(dimethylamino)ethyl methacrylate - Equilibrium adsorption - PH- and temperature-responsive - Polyhedral oligomeric silsesquioxanes - Soluble-insoluble - Spherical particle - Star-shaped polymer - Thermo-responsive behaviors
Classification code: 641.1 Thermodynamics - 701.1 Electricity: Basic Concepts and Phenomena - 801.3 Colloid Chemistry - 802.3 Chemical Operations - 804.1 Organic Compounds - 815.2 Polymerization
DOI: 10.1007/s00396-020-04737-x
Funding Details: Number: SK2019-81, Acronym: -, Sponsor: -; Number: 19JK0252, Acronym: -, Sponsor: -; Number: -, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: KFJJ-XB-2019-3, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This work has been financially supported by the Engineering Research Center of Development and Management for Low to Ultra-Low Permeability Oil & Gas Reservoirs in West China, Ministry of Education; Xi'an Shiyou University (KFJJ-XB-2019-3), the Special Scientific Research Plan Project of Shaanxi Provincial Department of Education (19JK0252), and the Science and Technology Plan Project of Shangluo (SK2019-81).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

186. Application of Fluorescence Spectroscopy in Identification of Aromatic Components in Single Oil Inclusions

Accession number: 20202608861961
Title of translation:
Authors: Si, Shang-Hua (1, 2); Zhao, Jing-Zhou (1, 2); Zou, Guo-Liang (3); Liu, Fei (4); Liu, Chao (1); Yan, Guan-Yu (1)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Hydrocarbon Accumulation Geology, Xi'an; 710065, China; (3) Exploration Department of PetroChina Changqing Oilfield Company, Xi'an; 710018, China; (4) Chongqing Gas Field, PetroChina Southwest Oil and Gas Field Company, Chongqing; 400021, China
Source title: Guang Pu Xue Yu Guang Pu Fen Xi/Spectroscopy and Spectral Analysis
Abbreviated source title: Guang Pu Xue Yu Guang Pu Fen Xi
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Language: Chinese
ISSN: 10000593

CODEN: GYGFED
Document type: Journal article (JA)
Publisher: Science Press
Abstract: In order to clarify the relationship between aromatic hydrocarbon components and micro-fluorescence spectra in oil inclusions, based on the fluorescence property of oil, the fluorescence spectra of oil inclusions in Gaotaizi reservoir in Qijia area of Songliao Basin were quantitatively described by non-destructive analysis of single inclusion components. Firstly, the fluorescence color types of oil inclusions in reservoirs were obtained, and then the fluorescence spectra of single oil inclusions were obtained. The main peak wavelength characteristic values of standard aromatics under 365 nm monochrome light excitation were compared. Finally, the hydrocarbon charging episodes and the types of aromatics in different episodes of oil inclusions were classified. The results show that there are three kinds of fluorescent oil inclusions: yellow, yellow-green and blue-green, which represent hydrocarbons charging with different maturity. The main aromatic components in oil inclusions are benzotetraphenyl, decacyclene and benzophenanthrene, followed by bilianthracene and a small amount of pentacene and red fluorene. Among them, the aromatic components in the first screen oil inclusion are pentacene, benzotetraphenyl, red fluorene and decacyclene; the aromatic components in the second screen oil inclusion are mainly benzotetrabenzene, decacyclene, benzophenanthrene and a small amount of red fluorene; and the third screen oil inclusion is benzophenanthrene. The main aromatic hydrocarbon components are benzotetraphenyl, decacyclene and benzophenanthrene, followed by bilianthracene. According to the types of aromatic hydrocarbon components, there are more high molecular weight aromatic hydrocarbons in Episode 1 than in Episode 2 and episode 3, showing lower maturity, while there are more types of small molecular aromatic hydrocarbons in Episode 2 and episode 3, showing medium maturity. Reservoir oil inclusions generally show fewer aromatics of small molecular weight and more aromatics of large molecular weight, which indicates that crude oil has undergone biodegradation and water washing before being captured by inclusions, and has undergone overheating and metamorphism after capturing. Crude oil in reservoir inclusions mainly consists of low-to medium-maturity crude oil. Finally, the relationship between the fluorescence spectrum characteristics of oil inclusions and the aromatics components is drawn up, which provides a basis for the study of the types and maturity of aromatics components in crude oil. © 2020, Peking University Press. All right reserved.
Number of references: 10
Main heading: Fluorescence
Controlled terms: Biodegradation - Aromatic hydrocarbons - Molecular weight - Petroleum reservoir engineering - Aromatization - Mineral oils - Crude oil
Uncontrolled terms: Aromatic components - Characteristic value - Fluorescence properties - Fluorescence spectra - High molecular weight - Hydrocarbon components - Light excitation - Non-destructive analysis
Classification code: 461.8 Biotechnology - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 513.3 Petroleum Products - 741.1 Light/Optics - 801.2 Biochemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics
Numerical data indexing: Size 3.65e-07m
DOI: 10.3964/j.issn.1000-0593(2020)06-1736-05
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

187. Synthesis of hierarchical MgO based on a cotton template and its adsorption properties for efficient treatment of oilfield wastewater (*Open Access*)

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Authors: Tang, Ying (1); Li, Zhaoyi (1); Xu, Zhongying (1); Zhang, Jie (2); Qu, Chengtun (2); Zhang, Zhifang (3)
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Corresponding author: Tang, Ying(tangying78@xsyu.edu.cn)
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Abbreviated source title: RSC Adv.
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Issue date: August 4, 2020
Publication year: 2020
Pages: 28695-28704
Language: English

E-ISSN: 20462069
CODEN: RSCACL
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A biomorphic MgO nanomaterial was fabricated via a facile and low-cost immersion method using cotton as the template. The obtained materials were characterized via X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM) and N2 adsorption-desorption analysis. The as-prepared MgO retained the structure of cotton, with a porous hierarchical structure and a high specific surface area, which endowed it with great potential due to its excellent adsorption properties for the adsorption of additives in oil field wastewater. It also exhibited the maximum adsorption capacity of 391.36 mg g-1 for sulfonated lignite. The adsorption process of sulfonated lignite on biomorphic MgO was systematically investigated and was found to obey the pseudo-second-order rate equation and the Langmuir adsorption model. The negative values of Gibbs free energy change (#G) showed that the adsorption process was feasible and spontaneous. The endothermic process was depicted with a positive value for #H. © 2020 The Royal Society of Chemistry.
Number of references: 37
Main heading: Magnesia
Controlled terms: Free energy - Oil fields - Fourier transform infrared spectroscopy - Additives - Gibbs free energy - Scanning electron microscopy - Wastewater treatment - Cotton - Adsorption - Physicochemical properties - Lignite
Uncontrolled terms: Adsorption capacities - Adsorption properties - Gibbs free energy changes - Hierarchical structures - High specific surface area - Langmuir adsorption model - Oilfield wastewaters - Pseudo-second-order rate equation
Classification code: 452.4 Industrial Wastes Treatment and Disposal - 512.1.1 Oil Fields - 524 Solid Fuels - 641.1 Thermodynamics - 801 Chemistry - 801.4 Physical Chemistry - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 821.4 Agricultural Products
DOI: 10.1039/d0ra04181e
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Funding text: This work was nancially supported by National Science Foundation of China (No. 21763030), Scientic Research Plan Projects of Shanxi Science and Technology Department (2019GY-136) and Xi'an Science and Techonlogy Project (201805038YD16CG22(3)). Postgraduate Innovation and Pac-tical Ability Training Project of Xi'an Shiyou University (YCS18211016).This work was financially supported by National Science Foundation of China (No. 21763030), Scientific Research Plan Projects of Shanxi Science and Technology Department (2019GY-136) and Xi'an Science and Techonlogy Project (201805038YD16CG22(3)). Postgraduate Innovation and Pactical Ability Training Project of Xi'an Shiyou University (YCS18211016).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
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188. Research on cross-well pseudorandom electromagnetic detection method and extraction of response characteristics (*Open Access*)

Accession number: 20202708896721
Authors: Song, Xijin (1); Momayez, Moe (2); Wang, Xuelong (1); Chen, Tao (3); Dang, Feng (3)
Author affiliation: (1) Key Laboratory of Photoelectric Logging and Detecting of Oil and Gas, Ministry of Education, Xi'an Shiyou University, Xi'an, China; (2) Department of Mining and Geological Engineering, The University of Arizona, Tucson; AZ, United States; (3) Technology Center, China National Petroleum Corporation Logging Co., Ltd, Xi'an, China
Corresponding author: Song, Xijin(sxj@xsyu.edu.cn)
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Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: A method is proposed that uses the metal casing of an oil and gas production well to construct a long dipole emission line source and applies pseudorandom multifrequency excitation signals to it to identify reservoir characteristics of interwell reservoirs. This method can significantly improve the work efficiency and precision of electrical prospecting. The cross-well pseudorandom response signal contains multiple main frequency components, as well as various measuring frequency points. Targeting the frequency components with different amplitudes and initial phases in the pseudorandom signal, the digital coherent detection method and its noise resistance are studied. Using this method can effectively extract the amplitude and phase information of each frequency component in different noise environments and has a strong ability to suppress signals of other frequencies. In the heterogeneous interwell reservoir detection model, the amplitude characteristics of each frequency component of the pseudorandom electromagnetic response at the measuring line with different well spacings are extracted. Numerical results show that the curve of equal-frequency measurement appears downwardly "concave" at the interface of the low-resistivity interlayer, and upwardly "convex" at the interface of the high-resistivity interlayer. With the increase in the resistivity of the low-resistivity interlayer, the dynamic range of the extraction component of the same frequency decreases gradually, and the family of equal-frequency response curves overlap with each other. By contrast, for the high-resistivity interlayer, as its resistivity gradually increases, the dynamic range of the extraction component of same frequency also increases gradually. Moreover, as well spacing varies, the response characteristics of the equal-frequency curve family on different measuring lines are also obviously different. The digital coherent detection method significantly simplifies the receiving circuit system. In practical application, response information of different discrete frequency components can be extracted according to requirements. This thus provides a theoretical basis for the extraction of resistivity and characteristic identification of interwell heterogeneous oil and gas reservoirs. © 2020 The Authors. Energy Science & Engineering published by the Society of Chemical Industry and John Wiley & Sons Ltd.
Number of references: 33
Main heading: Extraction
Controlled terms: Feature extraction - Petroleum reservoir engineering - Petroleum reservoirs - Frequency response - Oil wells - Well spacing
Uncontrolled terms: Amplitude characteristics - Characteristic identification - Digital coherent detections - Electromagnetic detection - Electromagnetic response - Frequency-response curves - Multi-frequency excitation - Reservoir characteristic
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 802.3 Chemical Operations
DOI: 10.1002/ese3.767
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

189. Tri-component coupling transesterification for efficient no-glycerol biodiesel production using methyl acetate as methyl reagent

Accession number: 20200408071997
Authors: Tang, Ying (1, 2); Liu, Huan (1); Li, Zhaoyi (1); Meng, Mei (1); Zhang, Jie (1, 3)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an, China; (2) Shaanxi Province Key Laboratory of Environmental Pollution Control and Reservoir Protection Technology of Oilfields, Xi'an, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing, China
Corresponding author: Tang, Ying(tangying78@xsyu.edu.cn)
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Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: BACKGROUND: Conventional transesterification of vegetable oil with methanol for biodiesel production leads to the separation of glycerol and relatively low reaction efficiency. Methyl acetate is a more common solvent being less toxic and less soluble in water. In the presence of bases the transesterification of methyl acetate with glycerol can easily proceed at refluxing temperature. RESULTS: A yield of fatty acid methyl ester (FAME) of 98.0% can be obtained with oil/methyl acetate/methanol molar ratio of 1:1:8 and 10% dosage of KCl/CaO at 65 °C after reaction for 1 h. Furthermore, results of water resistance experiments indicated that trace water gave a promoting effect on FAME yield. Recycling experiments were conducted for four cycles and a greater than 90% yield of FAME indicated the high stability of KCl/CaO. CONCLUSIONS: Efficient biodiesel production with no glycerol byproduct has been developed using a tri-component (canola oil, methyl acetate and methanol) coupling chemical reaction with calcium oxide-supported chloride as catalyst. Various characterization techniques revealed that the unique catalytic activity of KCl/CaO was related to its high degree of crystallinity, relatively high surface basicity and large pore size. © 2019 Society of Chemical Industry. © 2019 Society of Chemical Industry
Number of references: 34
Main heading: Biodiesel
Controlled terms: Alkalinity - Chlorine compounds - Catalyst activity - Lime - Molar ratio - Transesterification - Chemical industry - Fatty acids - Glycerol - Pore size - Crystallinity - Methanol
Uncontrolled terms: Biodiesel production - Characterization techniques - Degree of crystallinity - Fatty acid methyl ester - Reaction efficiency - Recycling experiments - Refluxing temperatures - Transesterification reaction
Classification code: 523 Liquid Fuels - 801.1 Chemistry, General - 801.4 Physical Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 805 Chemical Engineering, General - 931.2 Physical Properties of Gases, Liquids and Solids - 933.1 Crystalline Solids - 951 Materials Science
Numerical data indexing: Percentage 1.00e+01%, Percentage 8.00e+00%, Percentage 9.00e+01%, Percentage 9.80e+01%, Temperature 3.38e+02K, Time 3.60e+03s
DOI: 10.1002/jctb.6312
Funding Details: Number: 21763030, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019GY#136, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department; Number: 201805038YD16CG22, Acronym: -, Sponsor: Xi'an Science and Technology Bureau;
Funding text: This work was supported financially by the National Science Foundation of China (no. 21763030), Scientific Research Plan Projects of Shaanxi Science and Technology Department (2019GY136) and Xi'an Science and Technology Project (201805038YD16CG22(3)). The authors are grateful for the work of the Modern Analysis and Testing Center of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

190. 2D molybdenum carbide (Mo2C)/fluorine mica (FM) saturable absorber for passively mode-locked erbium-doped all-fiber laser (*Open Access*)

Accession number: 20203209017100
Authors: Liu, Sicong (1); Wang, Yonggang (1, 2); Lv, Ruidong (1); Wang, Jiang (1); Wang, Huizhong (1); Wang, Yun (1); Duan, Lina (3)
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Corresponding author: Wang, Yonggang(chinawygxjw@snnu.edu.cn)
Source title: Nanophotonics
Abbreviated source title: Nanophotonics
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Publication year: 2020
Pages: 2523-2530
Language: English
E-ISSN: 21928614
Document type: Journal article (JA)
Publisher: De Gruyter
Abstract: As a new member of saturable absorber (SA), molybdenum carbide (Mo2C) has some excellent optical properties. Herein, we report a new type of Mo2C/fluorine mica (FM) SA device. Uniform and compact Mo2C films were deposited on the FM by magnetron sputtering method. In order to increase the laser damage threshold, an additional protective layer of silicon oxide was deposited on the Mo2C. The FM is a single-layer structure of 20 μm, and its high elasticity makes it not easy to fracture. The transmission rate of FM is as high as 90% at near infrared wavelength. FM has better heat dissipation and softening temperature than organic composite materials, so it can withstand higher laser power without being damaged. In this work, Mo2C/FM SA was cut into small pieces and inserted into erbium-doped fiber laser to achieve mode-locked operation. The pulse duration and average output power of the laser pulses were 313 fs and 64.74 mW, respectively. In addition, a 12th-order sub-picosecond harmonic mode-locking was generated. The maximum repetition rate was 321.6 MHz and the shortest pulse duration was 338 fs. The experimental results show that Mo2C/FM SA is a broadband nonlinear optical mode-locker with excellent performance.

Number of references: 50
Main heading: Saturable absorbers
Controlled terms: Fiber lasers - Infrared devices - Laser damage - Molybdenum compounds - Optical properties - Silicon compounds - Carbides - Frequency modulation - Femtosecond lasers - Magnetron sputtering - Mode-locked fiber lasers - Pulse repetition rate - Passive mode locking - Silicon oxides
Uncontrolled terms: Erbium doped fiber laser - Laser damage threshold - Magnetron sputtering method - Mode locked operations - Near-infrared wavelength - Organic composite materials - Single-layer structure - Without being damaged
Classification code: 741.1 Light/Optics - 744.1 Lasers, General - 744.4 Solid State Lasers - 744.8 Laser Beam Interactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 812.1 Ceramics
Numerical data indexing: Frequency 3.22e+08Hz, Percentage 9.00e+01%, Power 6.47e-02W, Size 2.00e-05m, Time 3.13e-13s, Time 3.38e-13s
DOI: 10.1515/nanoph-2020-0019
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

191. Self-assembly of tetranuclear 3d-4f helicates as highly efficient catalysts for CO2cycloaddition reactions under mild conditions

Accession number: 20203309052598
Authors: Yang, Huan (1); Gao, Guoshu (1); Chen, Wanmin (1); Wang, Li (2); Liu, Weisheng (1)
Author affiliation: (1) Key Laboratory of Nonferrous Metals Chemistry and Resources Utilization of Gansu Province, State Key Laboratory of Applied Organic Chemistry, College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou; 730000, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Dalton Transactions
Abbreviated source title: Dalton Trans.
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Publication year: 2020
Pages: 10270-10277
Language: English
ISSN: 14779226
E-ISSN: 14779234
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Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A series of novel asymmetry 3d-4f helicates Zn3LnL4 (H2L = N-(2-((3,5-di-tert-butyl-2-hydroxybenzylidene)amino)ethyl)-2-hydroxybenzamide, Ln = Dy(1), Gd(2), Er(3)) were successfully constructed via selective incorporation of groups with different coordination capabilities. These helicates with the well-defined conformation demonstrate high catalytic efficiency in converting CO2 to cyclic carbonates under mild conditions. Particularly, Zn3ErL4 showed superior catalytic performance with high catalytic activity (TOF up to 38 000 h-1) and extraordinary selectivity (up to 99%) across the wide substrate scope. Meanwhile, these 3d-4f helicates showed stable catalytic performance without being influenced by the moisture and air. The results presented herein highlight an important consideration for constructing heterometallic and asymmetric complexes for catalyzing CO2 conversion. © 2020 The Royal Society of Chemistry.
Number of references: 75
Main heading: Carbon dioxide
Controlled terms: Self assembly - Catalyst activity - Zinc compounds
Uncontrolled terms: Catalytic efficiencies - Catalytic performance - Cyclic carbonates - Efficient catalysts - Helicates - Heterometallics - Selective incorporations
Classification code: 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 951 Materials Science
Numerical data indexing: Percentage 9.90e+01%
DOI: 10.1039/d0dt01743d
Funding Details: Number: 21431002, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

192. Study of the salt-formation and sedimentary evolution model of the Upper Ordovician Majiagou Formation in the Yan'an area

Accession number: 20210209750256
Title of translation:
Authors: Wu, Haiyan (1, 2); Liang, Ting (1); Cao, Hongxia (2); Qiao, Xiangyang (2); Wang, Kai (2); Li, Keyong (3); Yu, Jun (2); Guo, Yanqin (4)
Author affiliation: (1) College of Geosciences and Resources, Chang'an University, Xi'an; 710054, China; (2) Yanchang Petroleum Group (Limited Liability) Company Research Institute, Xi'an; 710069, China; (3) College of Geology and Environment, Xi'an University of science and Technology, Xi'an; 710054, China; (4) School of Earth Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liang, Ting(Liangt@chd.edu.cn)
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Volume: 94
Issue: 12
Issue date: December 15, 2020
Publication year: 2020
Pages: 3819-3829
Language: Chinese
ISSN: 00015717
Document type: Journal article (JA)
Publisher: Geological Society of China
Abstract: Over a decade of oil and gas explorations in the Yan'an area have yielded a series of breakthroughs in documenting theupper Ordovician Majiagou Formation, an important layer for natural gas exploration.This is the main sedimentary area of the Ordovician carbonate-gypsum rock symbiotic system, in which the M543-M532 gypsum deposit of the upper Majiagou Formation is a typical representative of the regressive evaporative environment. Based on the latest results from the development of Ordovician gas exploration in the Yan'an gas field, utilizing datafromcore observations, experimental analysis, drilling and logging, and on the basis of sedimentary structure, the scale of gypsum-salt rock development, lithologic assemblage and the geological characteristics of gypsum-salt rock assemblage in the Majiagou Formation in the study area are elaborated. Finally, the sedimentary background,

sedimentary facies and sedimentary evolution model of the assemblage gypsum-salt rocks in the Majiagou Formation in the study area are systematically summarized. The results indicate thatagainst the background of sedimentary pattern of high west and low east, stratum filling is characterized by thin west and thick east, thin south and thick north.The gypsum dolomite-gypsum-salt deposit area extends from southwest to northeast. Three types of rock assemblages were vertically developed: type I gypsum dolomite-anhydrite nodule dolomite-gypsum dolomite-mudstone assemblage; type II gypsum-anhydrite nodule dolomite-gypsum dolomite-mudstone assemblage; and type III salt-gypsum-anhydrite nodule dolomite-gypsum dolomite assemblage. It is a relatively quiet and low-energy lagoon sedimentary model. There is evolution of sedimentary environment into extreme evaporative salinization-evaporative gypsum-relative openness. The research results can be used as reference for geological research into the Ordovician gypsum salt rock in other areas of Ordos Basin and also provide important guidance for oil and gas exploration in the Yan'an gas field.
Number of references: 35
Main heading: Dolomite
Controlled terms: Deposits - Gas industry - Gases - Geological surveys - Gypsum - Metamorphic rocks - Natural gas fields - Petroleum prospecting - Salt deposits - Sedimentary rocks - Sedimentology
Uncontrolled terms: Evolution modeling - Gypsum-salt rocks - Majiagou formation - Ordos Basin - Ordovician - Ordovician majiagou formation - Salt-forming sedimentary model - Sedimentary evolution - Sedimentary models - The m54 3-m53 2 sub-member
Classification code: 481.1 Geology - 482.2 Minerals - 505.1 Nonmetallic Mines - 512.1.2 Petroleum Deposits : Development Operations - 512.2.1 Natural Gas Fields - 522 Gas Fuels
DOI: 10.19762/j.cnki.dizhixuebao.2020043
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

193. Toxic Rational Analysis of Oily Sludge and Its Treatment Residues (*Open Access*)

Accession number: 20203909221597
Authors: Li, Wanjing (1); Yu, Tao (1); Qu, Chengtun (1, 2); Zheng, Hao (1); Wang, Yanfei (1)
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Corresponding author: Qu, Chengtun(xianquct@xsyu.edu.cn)
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Issue title: 2020 International Conference on Green Energy, Environment and Sustainable Development
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Article number: 012045
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Conference name: 2020 International Conference on Green Energy, Environment and Sustainable Development, GEESD 2020
Conference date: April 24, 2020 - April 25, 2020
Conference location: Wuhan, Hubei, China
Conference code: 162637
Publisher: IOP Publishing Ltd
Abstract: In view of the present situation of oily sludge pollution, the different treatment methods for oily sludge in different uses were briefly described. The composition and structure of oily sludge are affected by sludge type, source, pyrolysis conditions and subsequent treatment conditions, which lead to different treatment methods and treatment effects. At present, there is no unified standard for the treatment of oily sludge at home and abroad, which brings difficulties to the unified management of oily sludge treatment. Through the toxicity analysis of oily sludge and its residues, it is helpful to judge the harmfulness of oily sludge and its treatment residues, according to the harmfulness of oily sludge, effectively choose different follow-up treatment methods, it is beneficial to establish the scientific

standard of oily sludge treatment. In this paper, the present post-treatment indexes of petroleum hydrocarbon content, heavy metal ion content, water content, Polycyclic aromatic hydrocarbon content and sulfur content in oily sludge are summarized. © Published under licence by IOP Publishing Ltd.
Number of references: 11
Main heading: Polycyclic aromatic hydrocarbons
Controlled terms: Metal ions - Heavy metals
Uncontrolled terms: Different treatments - Petroleum hydrocarbons - Present situation - Rational analysis - Scientific standards - Treatment conditions - Treatment effects - Treatment methods
Classification code: 531 Metallurgy and Metallography - 531.1 Metallurgy - 804.1 Organic Compounds
DOI: 10.1088/1755-1315/555/1/012045
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

194. CBM reservoir log and fine geo-model analysis techniques:Taking CBM in Surat basin as an example

Accession number: 20202608876294
Title of translation: -Surat
Authors: Lü, Jietang (1); Zhang, Ming (2); Huai, Yinchao (3); Tan, Chengqian (4); Chen, Xiongtao (4); Wang, Dianao (5)
Author affiliation: (1) China Institute of Geological Environment Monitoring, Beijing; 100081, China; (2) Research Institute of Petroleum Exploration and Development, Beijing; 100083, China; (3) Department of Geology, Northwest University, Xi'an; 710069, China; (4) School of Earth Scienas and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (5) Australian National University, Canberra; 2601, Australia
Corresponding author: Zhang, Ming(1027214218@qq.com)
Source title: Meitan Xuebao/Journal of the China Coal Society
Abbreviated source title: Meitan Xuebao
Volume: 45
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Publication year: 2020
Pages: 1824-1834
Language: Chinese
ISSN: 02539993
CODEN: MTHPDA
Document type: Journal article (JA)
Publisher: China Coal Society
Abstract: Deep geological knowledge of CBM reservoir log and geo-model are very important aspects that will influence the development effect of CBM gas field.Targeted at the low rank coal-bedding strata, the CBM project in Surat basin Australia had hundreds of wells that were measured in large time span.Also, these wells are in different well-spacing but in big variance in production rate.The reservoir study in old days was only to focus on the coal member, which is too coarse to meet the need of finer development and higher production rate.According to actual production need, the authors propose a set of techniques of deeply understanding reservoir.The first one is to build a multi-level framework of high resolution coal sequence strata in order to reveal the rules of coal ply space distribution and drainage area.The second is to create a workflow to do the log normalization so as to accurately interpret the coal thickness in wells.And then based on all analysis above, a coal-ply based model is built to explicate the complex of coal and the gas in place of gas field.This study has built a coal-based multi-stage high resolution sequence framework in order to depict pinch-out, merge features and drainage area of coal ply.Fine-coal log interpretation and quantitative complex lithology based on log normalization ensure the accuracy of coal ply and other lithology.Five micro-facies concept model was built.Gas field ply-based geo-model will be used to test the future regional stochastic swamp-based geo-model so as to reasonably optimize whole regional development plan and improve production rate based on the learning from ply model. © 2020, Editorial Office of Journal of China Coal Society. All right reserved.
Number of references: 31
Main heading: Coal
Controlled terms: Regional planning - Stochastic models - Gas industry - Methane - Coal bed methane - Coal deposits - Lithology - Stochastic systems - Natural gas wells - Well spacing

Uncontrolled terms: Complex lithology - Development effect - High resolution - Log interpretation - Low rank coals - Production rates - Regional development - Space distribution
Classification code: 403.2 Regional Planning and Development - 481.1 Geology - 503 Mines and Mining, Coal - 512.2 Natural Gas Deposits - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 524 Solid Fuels - 731.1 Control Systems - 804.1 Organic Compounds - 922.1 Probability Theory - 961 Systems Science
DOI: 10.13225/j.cnki.jccs.2019.0535
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

195. Synthesis and surface activity evaluation of new surfactants derived from cetyl betaine (*Open Access*)

Accession number: 20203809205425
Authors: Yang, Jian (1); Liu, Anbin (1); Li, Ze (1); Ma, Yanfeng (1); Lv, Shiyi (2, 3); Dong, Sanbao (2, 3)
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Corresponding author: Dong, Sanbao(dongsanbao2007@hotmail.com)
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Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
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Issue title: 4th International Symposium on Resource Exploration and Environmental Science - 4. Environmental Chemistry, Environmental Bioengineering and Related Technologies
Issue date: July 2, 2020
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Language: English
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Document type: Conference article (CA)
Conference name: 4th International Symposium on Resource Exploration and Environmental Science, REES 2020
Conference date: April 25, 2020 - April 26, 2020
Conference location: Ordos, China
Conference code: 161594
Publisher: IOP Publishing Ltd
Abstract: Because the surface tension, foaming ability, high temperature resistance, methanol resistance, salt resistance and foam shape of the single cetyltrimethylammonium chloride and cetyltrimethylammonium chloride reaction with formaldehyde are not very significant. Therefore, the product HM-CTAC and cetyl betaine were selected to optimize the compound ratio and further evaluate the performance of the compound product. The foam volume decreases gradually with the increase of temperature; in the aspect of methanol resistance: The foam volume of the compound surfactant disappears slowly under the same methanol concentration; in the aspect of salt resistance: The foam height is more stable with the increase of salt concentration in the system, and the half-life decreases gradually; the surface tension and foam microscopic: The surface tension of the compound system decreases. © Published under licence by IOP Publishing Ltd.
Number of references: 16
Main heading: Methanol
Controlled terms: Surface active agents - Aspect ratio - Chlorine compounds - Betaines - Temperature control - Surface tension
Uncontrolled terms: Cetyltrimethylammonium chloride - Compound system - Foaming ability - High temperature resistance - Methanol concentration - Salt concentration - Salt resistance - Surface activities
Classification code: 731.3 Specific Variables Control - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1088/1755-1315/514/5/052051

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Funding text: The work was supported financially by National Science Foundation of China (50874092), Scientific Research Program Funded by Shaanxi Provincial Education Department (18JC025) and Shaanxi Provincial Key Research and Development Program (2019GY-136). And we thank the work of Modern Analysis and Testing Center of Xi`an Shiyou University.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
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Data Provider: Engineering Village

196. Brittleness evaluation based on the energy evolution throughout the failure process of rocks

Accession number: 20202508843680
Authors: Wen, Tao (1, 2); Tang, Huiming (3); Wang, Yankun (3)
Author affiliation: (1) School of Geosciences, Yangtze University, Wuhan; Hubei; 430100, China; (2) The Key Laboratory of Well Stability and Fluid & Rock Mechanics in Oil and Gas Reservoir of Shaanxi Province, Xi'an Shiyou University, Xi'an; 71006, China; (3) Faculty of Engineering, China University of Geosciences, Wuhan; Hubei; 430074, China
Corresponding author: Tang, Huiming(tanghm@cug.edu.cn)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 194
Issue date: November 2020
Publication year: 2020
Article number: 107361
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Brittleness is an important mechanical property of rock masses and a key index used in various engineering practices particularly to evaluate hydraulic fracturing, rock fragmentation and rock burst. However, rock brittleness is a concept remaining to be determined since there are no unique standards available. In this study, two methods to determine the brittleness index are proposed by considering the pre-peak failure energy and post-peak fracture energy, which are regarded as key factors in determining whether brittle failure of rock occurs. By taking the Longmaxi Formation shale as an example, the energy evolution laws of shales under different confinements are first analyzed, and the evaluation methods are then examined and applied to these rocks. The results show that these brittleness indexes for shales are capable of describing the transition from absolute plasticity to absolute brittleness. The applicability and performance of the proposed indexes are further validated against large uniaxial and triaxial compression test datasets for different rock types. Application of these brittleness indexes to the tested rock types clearly demonstrate that the two indexes have opposite variation trends with rising confining pressure. Compared with the previous evaluation methods, the rationality of the methods proposed in this study is also verified. These results indicate the proposed brittleness indexes can reflect the brittle characteristics of the rock and the whole process of deformation and failure of the rock. Accordingly, these methods seem to offer reliable evaluations of the brittleness of rock in various engineering practices, although further validation is necessary. © 2020 Elsevier B.V.
Number of references: 46
Main heading: Stress-strain curves
Controlled terms: Rock bursts - Large dataset - Plasticity - Fracture mechanics - Compression testing - Failure (mechanical) - Brittleness
Uncontrolled terms: Brittleness index - Confining pressures - Deformation and failures - Energy evolutions - Engineering practices - Evaluation methods - Rock fragmentation - Tri-axial compression tests
Classification code: 502.1 Mine and Quarry Operations - 723.2 Data Processing and Image Processing - 914.1 Accidents and Accident Prevention - 931.1 Mechanics - 951 Materials Science
DOI: 10.1016/j.petrol.2020.107361
Funding Details: Number: WSFRM20190101001, Acronym: -, Sponsor: -; Number: D2019038, Acronym: -, Sponsor: Hubei Provincial Department of Education; Number: 2018M642799, Acronym: -, Sponsor: China Postdoctoral Science

Foundation; Number: 2017YFC1501305, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: The work was funded by the National Key R&D Program of China (2017YFC1501305), China Postdoctoral Science Foundation (grant number 2018M642799), Science and Technology Research Project of Hubei Education Department (D2019038), Open Foundation of Top Disciplines in Yangtze University and the Key Laboratory of Well Stability and the key laboratory of well stability and fluid & rock mechanics in Oil and gas reservoir of Shaanxi Province, Xi'an Shiyou University (No. WSFRM20190101001).The work was funded by the National Key R&D Program of China (2017YFC1501305), China Postdoctoral Science Foundation (grant number 2018M642799), Science and Technology Research Project of Hubei Education Department (D2019038), Open Foundation of Top Disciplines in Yangtze University and the Key Laboratory of Well Stability and the key laboratory of well stability and fluid & rock mechanics in Oil and gas reservoir of Shaanxi Province, Xi'an Shiyou University (No. WSFRM20190101001).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

197. Research Progress on Corrosion of Oil and Gas Field Gathering Pipeline in H2S-CO2-Cl-System (*Open Access*)

Accession number: 20203909221598
Authors: Wang, Yanfei (1); Li, Jinling (1); Qu, Chengtun (1, 2); Li, Wanjing (1); Baba Pali, Muhammad (1); Zheng, Hao (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Shaanxi Prov. Key Lab. of Environ. Poll. Control and Reservoir Protection Technology of Oil Fields, Xi'An Shiyou University, Xi'an, China; (2) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing; 102206, China
Corresponding author: Qu, Chengtun(xianquct@xsyu.edu.cn)
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Issue: 1
Issue title: 2020 International Conference on Green Energy, Environment and Sustainable Development
Issue date: August 28, 2020
Publication year: 2020
Article number: 012046
Language: English
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Green Energy, Environment and Sustainable Development, GEESD 2020
Conference date: April 24, 2020 - April 25, 2020
Conference location: Wuhan, Hubei, China
Conference code: 162637
Publisher: IOP Publishing Ltd
Abstract: With the development of the oil and gas field industry, the corrosion of metal materials in the H2S/CO2 environment has greatly restricted the development of the oil and gas industry. The corrosion of metal materials has gradually been paid attention to. The corrosion of steel under the H2S-CO2-Cl- system has been studied. Imminent. This paper briefly describes the corrosion and types of H2S and CO2 in steel for gathering pipelines, focusing on the reaction mechanism of corrosion, so as to achieve a more accurate grasp of corrosion laws and provide a theoretical basis for the development of new protection technologies. Keywords. H2S/CO2 environment; gathering pipeline steel; corrosion. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Carbon dioxide
Controlled terms: Pipelines - Gas industry - Environmental regulations - Steel pipe - Pipeline corrosion - Steel corrosion - Corrosion protection
Uncontrolled terms: Corrosion of steel - Gathering pipelines - Oil and gas fields - Oil and Gas Industry - Protection technologies - Reaction mechanism

Classification code: 454.2 Environmental Impact and Protection - 522 Gas Fuels - 539.1 Metals Corrosion - 539.2 Corrosion Protection - 545.3 Steel - 619.1 Pipe, Piping and Pipelines - 804.2 Inorganic Compounds
DOI: 10.1088/1755-1315/555/1/012046
Funding Details: Number: 2017081CGRC044,XASY005, Acronym: -, Sponsor: -; Number: 21808182,51974245, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 18JC089, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work was supported by the Open Project Program of state Key Laboratory of Petroleum Control; and the National Science Foundation of China (21808182, 51974245); and Scientific Research Program Funded by Shaanxi Provincial Education Department (18JC089) and Xi'an Science and Technology Planning Project (2017081CGRC044 (XASY005)).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

198. X-ray induced photodynamic therapy (PDT) with a mitochondria-targeted liposome delivery system (*Open Access*)

Accession number: 20202608870649
Authors: Gu, Xuefan (1); Gu, Xuefan (2); Gu, Xuefan (3); Shen, Chao (3); Li, Hua (1); Goldys, Ewa M. (2); Deng, Wei (2)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) ARC Centre of Excellence for Nanoscale Biophotonics, Graduate School of Biomedical Engineering, University of New South Wales, Kensington; NSW; 2052, Australia; (3) Faculty of Science and Engineering, Macquarie University, Sydney; NSW; 2109, Australia
Corresponding authors: Goldys, Ewa M.(e.goldys@unsw.edu.au); Deng, Wei(wei.deng@unsw.edu.au)
Source title: Journal of Nanobiotechnology
Abbreviated source title: J. Nanobiotechnology
Volume: 18
Issue: 1
Issue date: June 10, 2020
Publication year: 2020
Article number: 87
Language: English
E-ISSN: 14773155
CODEN: JNOAAO
Document type: Journal article (JA)
Publisher: BioMed Central Ltd, United Kingdom
Abstract: In this study, we constructed multifunctional liposomes with preferentially mitochondria-targeted feature and gold nanoparticles-assisted synergistic photodynamic therapy. We systemically investigated the in vitro X-ray triggered PDT effect of these liposomes on HCT 116 cells including the levels of singlet oxygen, mitochondrial membrane potential, cell apoptosis/necrosis and the expression of apoptosis-related proteins. The results corroborated that synchronous action of PDT and X-ray radiation enhance the generation of cytotoxic reactive oxygen species produced from the engineered liposomes, causing mitochondrial dysfunction and increasing the levels of apoptosis. © 2020 The Author(s).
Number of references: 44
Main heading: Gold nanoparticles
Controlled terms: Mitochondria - Cell death - Oxygen - Metal nanoparticles - Photodynamic therapy - Fiber optic sensors - Liposomes
Uncontrolled terms: Cell apoptosis - Cytotoxic - Delivery systems - Mitochondrial dysfunction - Mitochondrial membrane potential - Photodynamic therapy (PDT) - Singlet oxygen - X ray radiation
Classification code: 461.2 Biological Materials and Tissue Engineering - 461.6 Medicine and Pharmacology - 461.9 Biology - 741.1.2 Fiber Optics - 761 Nanotechnology - 804 Chemical Products Generally
DOI: 10.1186/s12951-020-00644-z
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

199. Dc voltage control strategy for Z-source inverter based on LADRC

Accession number: 20205109638792
Authors: Xu, Shuhao (1); Liu, Hailong (1); Li, Lin (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Shaanxi Provincial Key Laboratory of Oil and Gas Well Measurement and Control Technology, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Issue date: September 2020
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Article number: 9239716
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In this paper, linear active disturbance rejection control (LADRC) is applied to the capacitance voltage control of z-source inverter, which contains linear extended state observer (LESO) and linear error feedback control rate. The input voltage of the inverter is stabilized by stabilizing capacitor voltage. The Z source network capacitor voltage can be quickly restored to the reference voltage when the DC supply voltage fluctuates. Thus, the anti-disturbance ability of z-source inverter is improved. Compared with nonlinear ADRC, the parameter setting process is simplified Simulation results show the validity of the theory. © 2020 IEEE.
Number of references: 8
Main heading: Voltage control
Controlled terms: Disturbance rejection - Capacitance - Electric inverters
Uncontrolled terms: Capacitance voltage - Capacitor voltages - DC voltage control - Extended state observer - Linear active disturbance rejection controls - Parameter setting - Reference voltages - Z-source networks
Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 731 Automatic Control Principles and Applications - 731.3 Specific Variables Control
DOI: 10.1109/ICCNEA50255.2020.00069
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This research is a graduate student innovation and practice ability training project of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

200. A high sensitivity optical fiber strain sensor based on hollow core tapering

Accession number: 20201008258369
Authors: Dong, Leigang (1); Gang, Tingting (2); Bian, Ce (1); Tong, Rongxin (1); Wang, Jie (1); Hu, Manli (1)
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Corresponding author: Gang, Tingting(tingtinggang1@163.com)
Source title: Optical Fiber Technology
Abbreviated source title: Opt. Fiber Technol.
Volume: 56
Issue date: May 2020
Publication year: 2020

Article number: 102179
Language: English
ISSN: 10685200
CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: An optical fiber strain sensor based on a Mach-Zehnder interferometer (MZI) is demonstrated experimentally. The sensor is fabricated by fusion splicing a tapered hollow core fiber (THCF) with a 500 μm taper region between two single mode fibers (SMFs). Tapering on the HCF increases the sensor's strain sensitivity to 2.7 pm/$_{\mu E}$ in a measurement range of 0 $_{\mu E}$ to 2100 $_{\mu E,}$ 1.5 times larger than that of all-fiber MZI strain sensors without tapered areas (approximately 1.8 pm/$_{\mu E).}$ The experimental results show that the sensor has good stability and repeatability. This sensor has high strain sensitivity and low temperature sensitivity and can be used in environments with little temperature fluctuation. © 2020
Number of references: 24
Main heading: Mach-Zehnder interferometers
Controlled terms: Temperature - Fiber optic sensors - Optical fiber fabrication - Single mode fibers - Temperature sensors
Uncontrolled terms: Fiber strain sensors - High sensitivity - Hollow core fiber - Low temperature sensitivity - Machzehnder interferometers (MZI) - Measurement range - Strain sensitivity - Temperature fluctuation
Classification code: 641.1 Thermodynamics - 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 941.3 Optical Instruments - 944.5 Temperature Measuring Instruments
DOI: 10.1016/j.yofte.2020.102179
Funding Details: Number: 61377087, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 61377087).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

201. Research on High Performance 4G Wireless VPN for Smart Factory Based on Key Technologies of 5G Network Architecture

Accession number: 20203409090575
Authors: Jin, Qibing (1); Guo, Qing (1); Luo, Mingshi (2); Zhang, YuMing (1); Cai, Wu (1)
Author affiliation: (1) College of Information Science and Technology, Beijing University of Chemical Technology, Beijing, China; (2) School of Computer Science, Xi'an Shiyou University, Xi'an, China
Source title: 2020 International Wireless Communications and Mobile Computing, IWCMC 2020
Abbreviated source title: Int. Wirel. Commun. Mob. Comput., IWCMC
Part number: 1 of 1
Issue title: 2020 International Wireless Communications and Mobile Computing, IWCMC 2020
Issue date: June 2020
Publication year: 2020
Pages: 1443-1447
Article number: 9148068
Language: English
ISBN-13: 9781728131290
Document type: Conference article (CA)
Conference name: 16th IEEE International Wireless Communications and Mobile Computing Conference, IWCMC 2020
Conference date: June 15, 2020 - June 19, 2020
Conference location: Limassol, Cyprus
Conference code: 162085
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The mobile operation and wireless application of smart factory have many requirements for wireless transmission, such as low latency, high bandwidth, massive connections. 5G networks can meet the above performance requirements, mainly due to the technological evolution of 5G wireless technology and network architecture. This paper proposes a high-performance 4G virtual wireless private network solution, which innovatively applies MEC technology and network Slicing technology to the 4G network. This solution utilizes operators'4G public network frequencies and existing mature and low-cost Small cell equipment to build a secure 4G wireless virtual private

network, which can meet the requirements of end-to-end delay, bandwidth and massive-connection under the mixed conditions of HRLL service, wireless video, sensor data and other services at the same time. © 2020 IEEE.
Number of references: 7
Main heading: Network architecture
Controlled terms: Queueing networks - Virtual private networks - 5G mobile communication systems - Bandwidth - Wireless sensor networks
Uncontrolled terms: End to end delay - Key technologies - Performance requirements - Technological evolution - Wireless application - Wireless private network - Wireless technologies - Wireless transmissions
Classification code: 716 Telecommunication; Radar, Radio and Television - 716.1 Information Theory and Signal Processing - 716.3 Radio Systems and Equipment - 722.3 Data Communication, Equipment and Techniques
DOI: 10.1109/IWCMC48107.2020.9148068
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

202. Numerical investigation of supercritical methane in helically coiled tube on regenerative cooling of liquid rocket electromechanical actuator

Accession number: 20200408080903
Authors: Gao, Zhigang (1); Bai, Junhua (2); Zhou, Jun (1); Wang, Chaoran (1); Li, Peng (1)
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Corresponding author: Gao, Zhigang(gaozhigang@nwpu.edu.cn)
Source title: Cryogenics
Abbreviated source title: Cryogenics
Volume: 106
Issue date: March 2020
Publication year: 2020
Article number: 103023
Language: English
ISSN: 00112275
CODEN: CRYOAX
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: A numerical model employing the SST k-ω turbulent model is built to predict the turbulent flow and heat transfer of supercritical methane in helically coiled tube for the heat dissipation of high-power electromechanical actuator. The heat transfer mechanism and the crucial influence factors viz. pressure and heat flux are discussed, and the comparison between the semi-empirical heat transfer correlations and the simulation results are performed. The calculation results indicate that: (1) before the pseudo-critical point of supercritical methane in helically tube, the effect of the buoyancy caused by the thermophysical properties cannot be neglected; (2) the domination of the centrifugal force on the heat transfer after the pseudo-critical point of supercritical methane can be confirmed obviously, contributed to the non-uniform distribution of flow and heat transfer coefficient in cross sections; (3) pressure and heat flux both exhibit significant effects on heat transfer of supercritical methane in helically coiled tube; (4) the semi-empirical heat transfer correlation from Zhang et al. shows the best agreement against the simulation result in the present paper. © 2019 Elsevier Ltd
Number of references: 40
Main heading: Methane
Controlled terms: Electromechanical devices - Rockets - Electromechanical actuators - Tubes (components) - Heat flux - Thermodynamic properties
Uncontrolled terms: Flow and heat transfer - Heat transfer correlation - Heat transfer mechanism - Helically coiled tubes - Non-uniform distribution - Numerical investigations - Regenerative cooling - Super-critical pressures
Classification code: 619.1 Pipe, Piping and Pipelines - 641.1 Thermodynamics - 641.2 Heat Transfer - 654.1 Rockets and Missiles - 732.1 Control Equipment - 804.1 Organic Compounds
DOI: 10.1016/j.cryogenics.2019.103023
Funding Details: Number: 2019JQ-285, Acronym: -, Sponsor: -; Number: 61973254, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This study was supported by the National Natural Science Foundation of China (Grant No. 61973254), and the Natural Science Basic Research Plan of Shaanxi Province in China (Program No. 2019JQ-285).
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village

203. Research on dynamic voltage rise control driven by IGBT

Accession number: 20205109638816
Authors: Li, Yuntao (1); Liu, Hailong (1); Li, Lin (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Shaanxi Provincial Key Laboratory of Oil and Gas Well Measurement and Control Technology, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
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Language: English
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Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to suppress the turn-off voltage spikes caused by the turn-off of high-power insulated gate bipolar transistors, a method of sampling the turn-off change rate through a small capacitor and performing closed-loop control is proposed. This circuit makes up for the defects of the traditional dynamic voltage rise control circuit that the magnification is not adjustable and shuts off the oscillation, which improves the stability and reliability of the circuit. Finally, through SABER simulation and experimental verification, the simulation results and experimental results confirm the feasibility of the program. © 2020 IEEE.
Number of references: 13
Main heading: Insulated gate bipolar transistors (IGBT)
Uncontrolled terms: Closed-loop control - Control circuits - Dynamic voltage - Insulated gate - ON dynamics - SABER simulation - Stability and reliabilities - Turn-off voltage
Classification code: 714.2 Semiconductor Devices and Integrated Circuits
DOI: 10.1109/ICCNEA50255.2020.00070
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This research is a graduate student innovation and practice ability training project of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

204. Stress Testing of Steel Suspender of Arch Bridge Model Based on Induced Magnetic Flux Method (*Open Access*)

Accession number: 20201008251235
Authors: Weng, Guangyuan (1); Yang, Liu (2); Xiyu, Zhu (1)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Urban Planning and Municipal Engineering, Xi'an Polytechnic University, Xi'an; 710048, China
Corresponding author: Weng, Guangyuan(weng_guangyuan@163.com)
Source title: Advances in Materials Science and Engineering
Abbreviated source title: Adv. Mater. Sci. Eng.
Volume: 2020

Issue date: 2020
Publication year: 2020
Article number: 7470156
Language: English
ISSN: 16878434
E-ISSN: 16878442
Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: To establish an online nondestructive stress testing method for arch bridge suspender based on the principle of magnetic coupling, the magnetic mechanical property of Q345qD steel is explored taking an arch bridge model structure with Q345qD steel suspender as the research object. Under the action of magnetic field excited by a coil, the test of the coupling relationship between stress and excitation flux is carried out. The theoretical model of stress-magnetic flux is simplified to better meet the requirements of engineering applications. The excitation device, magnetic flux measurement device, stress-magnetic flux data analysis program, and so on are developed, and the magnetic coupling stress detection system is integrated. The test model structure of a steel arch bridge with suspenders of Q345qD alloy steel is designed and made; under the different load conditions, the stresses of the suspenders are tested and studied. The relationships between induced magnetic flux and technical magnetized voltage, test load of model structure, and different stress conditions of the suspenders are analyzed; with the induction magnetic flux as the parameter, the stress-magnetic flux coupling model is established. The test results based on the stress-magnetic flux coupling model are compared with those of the traditional stress-strain test in a linear elastic range; it shows that the two testing methods are in good agreement with each other, and the maximum error is less than 5%. Meanwhile, with the increase in the load on the suspender, the tension stress increases and the induced magnetic flux decreases, showing a good linear relationship. The conclusions drawn from the research can provide important reference for health monitoring of suspenders of arch bridges. © 2020 Guangyuan Weng et al.
Number of references: 29
Main heading: Arch bridges
Controlled terms: Magnetic flux - Steel testing - Arches - Nondestructive examination - Stresses
Uncontrolled terms: Arch bridge suspenders - Coupling relationships - Engineering applications - Linear relationships - Magnetic flux coupling - Magnetic flux measurements - Stress testing method - Theoretical modeling
Classification code: 401.1 Bridges - 408.2 Structural Members and Shapes - 545.3 Steel - 701.2 Magnetism: Basic Concepts and Phenomena
Numerical data indexing: Percentage 5.00e+00%
DOI: 10.1155/2020/7470156
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
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205. Design and Modeling of Oceanographic Environment Adaptive Variable Pumps (*Open Access*)

Accession number: 20202108676356
Authors: Cao, Xuepeng (1); Tuo, Shuaihua (1); Zhang, Cuihong (2); Moussa, Ahmat Djime (1); Lei, Zhen (1)
Author affiliation: (1) National Engineering Laboratory of Highway Maintenance Equipment, Chang'an University, Xi'an; 710064, China; (2) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Cao, Xuepeng(tiepeng2001@chd.edu.cn)
Source title: IEEE Access
Abbreviated source title: IEEE Access
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Publication year: 2020
Pages: 73015-73026
Article number: 9066987
Language: English
E-ISSN: 21693536
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc., United States

Abstract: Variable pumps are important hydraulic power units in deep-sea exploitation due to their good energy-saving and high precision capabilities. However, their application in such hostile environment suffers from the risk of control failure. Moreover, developed throughout trials and error in onshore simulation experiment, it is thus not just a time-consuming and expensive task but also required to implement an adaptive scheme capability to be used in deep-sea application. In this paper, a self-adaptive pressure sensing scheme and a novel close-loop control structure involved oceanographic environment adaptive variable pump (OEAVP) are proposed to autonomously adapt to the variable seawater conditions. Furthermore, based on environmental and fluid models, dynamic performances of the OEAVP model for pressure and flow-rate controls are analyzed. MATLAB/Simulink pack tool is used to perform the OEAVP system stability and comparative deep-sea water and shallow-water stability control are addressed. It reveals oceanographic environment influences on control performances of OEAVP from the direct effect of ambient pressure and the indirect effect of hydraulic fluid properties changes. Ultimately experimental tests including SPSS performances, control characteristics and dynamic responses of OEAVP's are performed in a simulation hull, which demonstrates consistent performances in oceanographic environment and confer to the proposed OSVP with high adaptive capability. © 2013 IEEE.
Number of references: 31
Main heading: Pumps
Controlled terms: Adaptive control systems - MATLAB - System stability - Seawater - Energy conservation
Uncontrolled terms: Adaptive capabilities - Consistent performance - Control characteristics - Control performance - Design and modeling - Dynamic performance - Environment influence - Hostile environments
Classification code: 471.4 Seawater, Tides and Waves - 525.2 Energy Conservation - 618.2 Pumps - 723.5 Computer Applications - 731.1 Control Systems - 921 Mathematics - 961 Systems Science
DOI: 10.1109/ACCESS.2020.2987859
Funding Details: Number: 300102258201, Acronym: -, Sponsor: -; Number: 2018J1,2019J3, Acronym: -, Sponsor: -; Number: 18-16K, Acronym: -, Sponsor: -; Number: 51509006, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported in part by the National Natural Science Foundation of China under Grant 51509006, in part by the Central Universities Funds of Chang'an University under Grant 300102258201, in part by the Research project of Shaanxi Provincial Department of Transportation under Grant 18-16K, and in part by the Scientific Planning Project of Henan Provincial Department of Transportation under Grant 2018J1 and Grant 2019J3.
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

206. Removal mechanism of titanium alloy material in ultrasound vibration drilling

Accession number: 20202708891560
Authors: Wang, Tianqi (1, 2); Liu, Zhanfeng (2); Qiu, Yuanying (1); Feng, Yazhou (2); Han, Xiaolan (2)
Author affiliation: (1) School of Mechano-electronic Engineering, Xidian University, Xi'an; Shaanxi; 710071, China; (2) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Source title: Materials Science Forum
Abbreviated source title: Mater. Sci. Forum
Volume: 993 MSF
Part number: 1 of 1
Issue title: Functional and Functionally Structured Materials IV
Issue date: 2020
Publication year: 2020
Pages: 3-11
Language: English
ISSN: 02555476
E-ISSN: 16629752
CODEN: MSFOEP
ISBN-13: 9783035715668
Document type: Conference article (CA)
Conference name: 20th Chinese Materials Conference, CMC 2019
Conference date: July 10, 2019 - July 14, 2019
Conference location: Chengdu, China
Conference code: 240909
Publisher: Trans Tech Publications Ltd

Abstract: In drilling the ultra-slim small diameter deep hole of titanium alloy, the problem of chip breaking and chip removal is common. When the drill is working normally, the ultrasonic vibration can be applied for the drill bit to cut the bit in the vibration to form a pulse. The cutting force waveform in drilling, should select the reasonable vibration frequency, amplitude, feed amount, workpiece rotation and other parameters to match, control the size and shape of the chip, get satisfactory chips, and avoid chip clogging. In this study, the ANSYS finite element simulation software was used to simulate the TC4 drilling process, and the difference between ultrasonic vibration drilling and ordinary drilling was analyzed. Drilling experiments were carried out. The experimental results show that compared with conventional drilling, ultrasonic vibration drilling has better surface quality, reduced tool wear and increased material removal rate. © 2020 Trans Tech Publications Ltd, Switzerland.
Number of references: 14
Main heading: Titanium alloys
Controlled terms: Ultrasonic effects - Drills - Infill drilling - Vibration analysis - Computer software - Ultrasonic waves
Uncontrolled terms: Ansys finite elements - Conventional drilling - Drilling process - Material removal rate - Removal mechanism - Ultrasonic vibration - Ultrasound vibration - Vibration frequency
Classification code: 511.1 Oil Field Production Operations - 542.3 Titanium and Alloys - 603.2 Machine Tool Accessories - 723 Computer Software, Data Handling and Applications - 753.1 Ultrasonic Waves
DOI: 10.4028/www.scientific.net/MSF.993.3
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

207. Research on an improved single neuron pi control strategy

Accession number: 20205109638686
Authors: Li, Lin (1, 2); Luo, Mingshuai (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 - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Issue date: September 2020
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Article number: 9239806
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In the control system of AC variable frequency speed regulation of asynchronous motor, vector control method is adopted in most of them, and PI control strategy is usually used in speed loop of vector control system. For pulse load system, such as sports training treadmill, the parameters of PI controller in vector control system can't be modified timely according to the characteristics of pulse load, so it can't obtain high-efficiency smooth speed regulation characteristics. Therefore, a single neuron PI control strategy is proposed, which can improve the online performance of single neuron PI controller by establishing a learning algorithm of single neuron gain K Real time adjustment capability. The motor control system based on motion training treadmill is studied in this paper. The model of asynchronous motor vector control system is built in Matlab / Simulink environment. The PI algorithm and single neuron PI algorithm are compared, and the influence of single neuron PI algorithm on the control quality of the whole system is discussed. © 2020 IEEE.
Number of references: 12
Main heading: MATLAB

Controlled terms: Induction motors - Vector control (Electric machinery) - Controllers - Two term control systems - Neurons - Vectors - Quality control
Uncontrolled terms: MATLAB/Simulink environment - Motor control system - On-line performance - PI control strategy - Single neuron PI controller - Sports trainings - Variable-frequency speed regulation - Vector control method
Classification code: 461.9 Biology - 705.3.1 AC Motors - 723.5 Computer Applications - 731.1 Control Systems - 731.2 Control System Applications - 732.1 Control Equipment - 913.3 Quality Assurance and Control - 921 Mathematics - 921.1 Algebra
DOI: 10.1109/ICCNEA50255.2020.00090
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This research is a graduate student innovation and practice ability training project of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

208. A Seismic Image Denoising Method Based on Kernel-prediction CNN Architecture

Accession number: 20204909581019
Authors: Lou, Li (1, 2); Li, Yong (1)
Author affiliation: (1) School of Electronics and Information, Northwestern Polytechnical University, Xi'an Shaanxi; 710072, China; (2) Computer College of xi'An ShiYou University, Xi'an Shaanxi; 710065, China
Source title: International Journal on Artificial Intelligence Tools
Abbreviated source title: Int. J. on Artif. Intell. Tools
Volume: 29
Issue: 7-8
Issue date: December 2020
Publication year: 2020
Article number: 2040012
Language: English
ISSN: 02182130
E-ISSN: 17936349
Document type: Journal article (JA)
Publisher: World Scientific
Abstract: To filter noises and preserve the details of seismic images, a denoising method based on kernel prediction convolution neural network (CNN) architecture is proposed. The method consists of two convolution layers and a residual connection, containing a source sensing encoder, a spatial feature extractor and a kernel predictor. The scalar kernel was normalized by the softmax function to obtain the denoised images. In addition, to avoid excessive blur at the expense of image details, the authors put forward the concept of asymmetric loss function, which would enable users to control the level of residual noise and make a trade-off between variance and deviation. The experimental results show the proposed method achieved good denoising effect. Compared with some other excellent methods, the proposed method increased the peak signal-to-noise ratio (PSNR) by about 1.0-3.2 dB for seismic images without discontinuity, and about 1.8-3.9 dB for seismic images with discontinuity. © 2020 World Scientific Publishing Company.
Number of references: 22
Main heading: Convolution
Controlled terms: Economic and social effects - Seismic waves - Seismology - Signal to noise ratio - Image denoising - Network architecture
Uncontrolled terms: Asymmetric loss function - Convolution neural network - Denoising methods - Kernel predictions - Peak signal to noise ratio - Residual noise - Seismic image - Spatial features
Classification code: 484 Seismology - 484.1 Earthquake Measurements and Analysis - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 971 Social Sciences
Numerical data indexing: Decibel 1.00e+00dB to 3.20e+00dB, Decibel 1.80e+00dB to 3.90e+00dB
DOI: 10.1142/S0218213020400126
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

209. Edge length-dependent interlayer friction of graphene (*Open Access*)

Accession number: 20210609893662
Authors: Zhang, Hongwei (1); Li, Yanwei (1); Qu, Jinfeng (2); Zhang, Jingnan (1)
Author affiliation: (1) School of Urban Planning and Municipal Engineering, Xi'an Polytechnic University, Xi'an; 710048, China; (2) School of Science, Xi'an Shiyou University, Xi'an; 710065, China
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Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Edge effects have significant implications in friction at the nanoscale. Despite recent progress, a detailed understanding of the relationship between nanoscale friction and contact edges is still sorely lacking. Here, using molecular dynamics simulations, we investigate the intrinsic effect of the edge size on the nanoscale friction between graphene layers in the incommensurate case based on the model of graphene flakes on a supported graphene substrate. An original rectangular graphene sheet is cut and divided into two independent parts, namely, the inside and outside zones, according to a certain path with a hexagonal boundary. The friction of the inside and the outside flakes placed on a substrate is calculated. The results interestingly reveal that the sum of the friction forces on the inside and outside of flakes, termed the "equivalent friction force", is substantially greater than that of the original rectangular graphene sheet because the additional edge friction of the former two systems is more than that of the latter system. More importantly, the equivalent friction force is linearly proportional to the edge size due to the larger cropped edge size having more edge friction. This work demonstrates the intrinsic dependence of friction on the contact edge size of incommensurate graphene layers. © The Royal Society of Chemistry 2020.
Number of references: 39
Main heading: Friction
Controlled terms: Nanotechnology - Molecular dynamics - Graphene
Uncontrolled terms: Graphene layers - Graphene sheets - Graphene substrates - Intrinsic effects - Linearly proportional - Molecular dynamics simulations - Nanoscale friction - Recent progress
Classification code: 761 Nanotechnology - 801.4 Physical Chemistry - 804 Chemical Products Generally
DOI: 10.1039/d0ra08457c
Funding Details: Number: 11602139, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: BS201821, Acronym: XPU, Sponsor: Xi'an Polytechnic University; Number: 20JK0849, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2019JQ-334, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: The authors would like to acknowledge the support of the National Natural Science Foundation of China (Grant No. 11602139), the Natural Science Basic Research Program of Shaanxi (Grant No. 2019JQ-334), the Scientic Research Program Funded by Shaanxi Provincial Education Department (Grant No. 20JK0849) and the PhD Research Start-up Fund of Xi'an Polytechnic University (Grant No. BS201821).The authors would like to acknowledge the support of the National Natural Science Foundation of China (Grant No. 11602139), the Natural Science Basic Research Program of Shaanxi (Grant No. 2019JQ-334), the Scientific Research Program Funded by Shaanxi Provincial Education Department (Grant No. 20JK0849) and the PhD Research Start-up Fund of Xi?an Polytechnic University (Grant No. BS201821).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

210. Characterizations of hoops based on stabilizers

Accession number: 20204309397398
Authors: Wang, Jun Tao (1); Borzooei, R.A. (2); Aaly Kologani, M. (3)
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Source title: Journal of Intelligent and Fuzzy Systems
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Pages: 4341-4348
Language: English
ISSN: 10641246
E-ISSN: 18758967
Document type: Journal article (JA)
Publisher: IOS Press BV
Abstract: In this paper, we characterize the algebraic structure of hoops via stabilizers. First, we further study left and right stabilizers in hoops and discuss the relationship between them. Then, we characterize some special classes of hoops, for example, Wajsberg hoops, local hoops, Gödel hoops and stabilizer hoops, in terms of stabilizers. Finally, we further determine the relationship between stabilizers and filters in hoops and obtain some improvement results. This results also give answer to open problem, which was proposed in [Stabilizers in MTL-algebras, Journal of Intelligent and Fuzzy Systems, 35 (2018) 717-727]. These results will provide a more general algebraic foundation for consequence connectives in fuzzy logic based on continuous t-norms.
Number of references: 18
Main heading: Algebra
Controlled terms: Fuzzy logic
Uncontrolled terms: Algebraic structures - And filters - Continuous t-norms - MTL-algebras - Special class
Classification code: 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 921.1 Algebra
DOI: 10.3233/JIFS-200345
Funding Details: Number: 20JK0626, Acronym: -, Sponsor: -; Number: 2020JQ-762, Acronym: -, Sponsor: -; Number: 61976244,11961016, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This study for the first author,was funded by a grant of National Natural Science Foundation of China (61976244,11961016), the Natural Science Basic Research Plan in Shaanxi Province of China (2020JQ-762) and the Natural Science Foundation of Education Committee of Shannxi Province (20JK0626).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

211. Effect of grain morphology on the degradation behavior of Mg-4 wt% Zn alloy in Hank's solution

Accession number: 20193707417691
Authors: Jia, Hongmin (1, 2); Feng, Xiaohui (1); Yang, Yuansheng (1)
Author affiliation: (1) Institute of Metal Research, Chinese Academy of Sciences, Shenyang; 110016, China; (2) Xi'an Shiyou University, School of Materials Science and Engineering, Xi'an; 710065, China
Corresponding author: Jia, Hongmin(hmjia12s@alum.imr.ac.cn)
Source title: Materials Science and Engineering C
Abbreviated source title: Mater. Sci. Eng. C
Volume: 106
Issue date: January 2020
Publication year: 2020
Article number: 110013
Language: English
ISSN: 09284931
E-ISSN: 18730191
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The degradation behavior of Mg-4 wt% Zn alloy with three different microstructures was examined in Hank's solution at 37 °C by electrochemical measurements and immersion tests in this study. The results show that the sample with cellular structure exhibits a more positive corrosion potential, lower corrosion current density, larger impedance and more protective film than samples with columnar dendritic and equiaxed dendritic structure. The higher

corrosion resistance is attributed to the preferred orientation, eliminating susceptible grain boundaries and reduced secondary phases. © 2019
Number of references: 34
Main heading: Grain boundaries
Controlled terms: Morphology - Magnesium alloys - Textures - Corrosion protection - Corrosion resistance - Zinc alloys
Uncontrolled terms: Corrosion current densities - Corrosion potentials - Degradation behavior - Electrochemical measurements - Grain morphologies - Hank's solution - Mg alloy - Preferred orientations
Classification code: 539.1 Metals Corrosion - 539.2 Corrosion Protection - 542.2 Magnesium and Alloys - 546.3 Zinc and Alloys - 549.2 Alkaline Earth Metals - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Temperature 3.10e+02K
DOI: 10.1016/j.msec.2019.110013
Funding Details: Number: 2017YFB0103904, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: This work was financially supported by National Key Research and Development Program of China (No. 2017YFB0103904).
Compendex references: YES
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212. Design and analysis of iron roughneck non-clamp-tooth clamping mechanism (*Open Access*)

Accession number: 20204809532039
Authors: Yan, Wenhui (1); Xie, Dong (1); Guo, Litong (2); Zhao, Longgui (1); Peng, Yong (1); Hu, Nan (3)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, Xi'an, China; (2) Shaanxi Huajing Micro Electronic Co., Ltd, Xi'an, China; (3) Institute of Baoji Oilfield Machinery Co., Ltd., Baoji, China
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Volume: 1653
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Issue: 1
Issue title: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar
Issue date: November 2, 2020
Publication year: 2020
Article number: 12031
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar, ICAMIM 2020
Conference date: August 21, 2020 - August 23, 2020
Conference location: Guilin, China
Conference code: 164482
Publisher: IOP Publishing Ltd
Abstract: During the makeup and breakout operation of iron roughneck, the performance of the clamp tooth holding the pipe string directly affects the drilling efficiency and the service life of the pipe string. In this paper, a cylindrical non-clamp-tooth Clamping body with 20CrMnTi material is designed to replace the upper shackle clamp tooth. In the up-shackle operation of the torque wrench, the clamping body contacts the outer wall of the string in the form of two parallel axis cylinders, the relationship between each influencing factor and contact stress is established, and the contact stress and deformation of the string are simulated by finite element method. This non-clamp-tooth clamping body can reduce the damage degree of the string, make its elastic deformation not exceed 1mm, and improve the service life of the clamping body. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 6
Main heading: Iron

Controlled terms: Ternary alloys - Chromium alloys - Manganese alloys - Titanium alloys
Uncontrolled terms: Body contacts - Clamping mechanism - Contact Stress - Design and analysis - Drilling efficiency - Iron roughneck - Parallel axis - Torque wrenches
Classification code: 542.3 Titanium and Alloys - 543.1 Chromium and Alloys - 543.2 Manganese and Alloys - 545.1 Iron
Numerical data indexing: Size 1.00e-03m
DOI: 10.1088/1742-6596/1653/1/012031
Funding Details: Number: MiIT [2016]24, Acronym: -, Sponsor: -; Number: -, Acronym: MIIT, Sponsor: Ministry of Industry and Information Technology of the People's Republic of China;
Funding text: Thanks the Ministry of Industry and Information Technology of the People's Republic of China for the financial support of " Seventh Generation Ultra Deep Water Drilling Platform (Ship) Innovation Special Project " --" Application of Drilling Package Integration and Application of Some Key Equipment " (No.: MiIT [2016]24). Thanks for the great support from the Research Institute of Xi'an Shiyou University.
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

213. A first-principles study of hydrogen adsorption on Ni-decorated defective GaN monolayer

Accession number: 20202008658079
Authors: Li, Si-Qi (1); Chen, Guo-Xiang (1); Fan, Xiao-Bo (1); Wang, Rui-Xue (1); Li, Han-Xiao (1); Zhang, Jian-Min (2)
Author affiliation: (1) College of Sciences, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) College of Physics and Information Technology, Shaanxi Normal University, Xi'an; Shaanxi; 710062, China
Corresponding author: Chen, Guo-Xiang(guoxchen@xsyu.edu.cn)
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Abbreviated source title: Solid State Commun
Volume: 316-317
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Article number: 113951
Language: English
ISSN: 00381098
CODEN: SSCOA4
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: We systematically study the geometric stability and hydrogen storage capacity of Ni atom decorated GaN monolayer (GaN-ML) with three types defects (VN, VGa and SW defect) using the first-principles calculations based on density functional theory (DFT-D2 method). For Ni-decorated defective GaN-ML, Ni atom can be stably combined on substrates due to higher binding energy, and the Ni atom can accommodate up to three H2 molecules. The H2 molecules adsorbed on Ni-decorated VGa substrate undergo a weak physical interaction. However, the Ni-decorated VN and SW defect substrates show sensitive to H2 molecules, which can satisfy the requirement for hydrogen storage. The molecular dynamics (MD) simulations show that the maximum of eight H2 molecules are stably adsorbed on the Ni atoms at room temperature with the hydrogen storage capacity of 5.36 wt%, and there is no structural deformation of the VN substrate plane. Therefore, these results indicate that the Ni-decorated defective GaN-ML can be potential candidates for better storage of H2 molecules. Our work can supply some guidance to explore promising novel hydrogen storage materials in energy storage field using group III-V nitrides. © 2020 Elsevier Ltd
Number of references: 55
Main heading: Monolayers
Controlled terms: Density functional theory - Gallium nitride - Defects - Gas adsorption - Molecules - Substrates - Binding energy - Hydrogen storage - III-V semiconductors - Nickel - Calculations - Atoms - Molecular dynamics
Uncontrolled terms: First-principles calculation - First-principles study - Geometric stability - Hydrogen adsorption - Hydrogen storage capacities - Molecular dynamics simulations - Physical interactions - Structural deformation
Classification code: 522 Gas Fuels - 548.1 Nickel - 712.1 Semiconducting Materials - 801.4 Physical Chemistry - 802.3 Chemical Operations - 921 Mathematics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

214. CFD-based reduced-order modeling of fluidized-bed biomass fast pyrolysis using artificial neural network

Accession number: 20200508100723
Authors: Zhong, Hanbin (1); Xiong, Qingang (2); Yin, Lina (1); Zhang, Juntao (1); Zhu, Yuqin (1); Liang, Shengrong (1); Niu, Ben (1); Zhang, Xinyu (1)
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Source title: Renewable Energy
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Volume: 152
Issue date: June 2020
Publication year: 2020
Pages: 613-626
Language: English
ISSN: 09601481
E-ISSN: 18790682
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In order to reduce the computational effort of design and optimization for biomass fast pyrolysis reactor, the reduced-order modeling technology was applied to develop reduced-order models (ROMs) based on the CFD data from multi-fluid model (MFM) simulation of biomass fast pyrolysis in a bubbling fluidized bed reactor. The CFD simulations at nine different pyrolysis temperatures were performed, and the product yields and the influence of temperature on product yields were in a good agreement with experiments, which fully validated the CFD approach. The back-propagation (BP) artificial neural network (ANN) was used to map the species mass fraction data of CFD simulation to pyrolysis temperature and coordinates of each computational node in the reactor. The number of neurons and active function in the ANN was optimized. The ability of the developed ROMs to predict the species distributions at both training and testing temperature was investigated. The influence of sample method and number of outputs was also studied. © 2020 Elsevier Ltd
Number of references: 38
Main heading: Computational fluid dynamics
Controlled terms: Backpropagation - Supersaturation - Biomass - Data reduction - Pyrolysis - Ability testing - Fluidized beds - Chemical reactors - Neural networks
Uncontrolled terms: Biomass fast pyrolysis reactors - Bubbling fluidized bed reactor - Design and optimization - Fast pyrolysis - Multi-fluid models - Pyrolysis temperature - Reduced order models - Species distributions
Classification code: 723.2 Data Processing and Image Processing - 723.4 Artificial Intelligence - 723.5 Computer Applications - 801.4 Physical Chemistry - 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 912.4 Personnel - 931.1 Mechanics
DOI: 10.1016/j.renene.2020.01.057
Funding Details: Number: -, Acronym: -, Sponsor: State Key Laboratory of Heavy Oil Processing; Number: 2018D-5007-0402, Acronym: -, Sponsor: PetroChina Innovation Foundation;
Funding text: Financial supports from the PetroChina Innovation Foundation (No. 2018D-5007-0402) and State Key Laboratory of Heavy Oil Processing (No. SKLHOP201804) were greatly appreciated.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

215. Numerical simulation of random wave loads on slender vertical cylinder at sea

Accession number: 20214010985801
Authors: Chen, Feng (1); Du, Yifei (2); Li, Wanzhong (2); Deng, Jielin (3)
Author affiliation: (1) Neusoft Institute, Foshan; 528225, China; (2) Xi'An Shiyou University, School of Mechanical Engineering, Xi'an; 710065, China; (3) Keen Offshore Engineering Co., Ltd., Foshan; 528241, China
Corresponding author: Li, Wanzhong(liwanzhong@xsyu.edu.cn)
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Abbreviated source title: Proc. - Int. Conf. Virtual Real. Intell. Syst., ICVRIS
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Virtual Reality and Intelligent Systems, ICVRIS 2020
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Language: English
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Conference name: 2020 International Conference on Virtual Reality and Intelligent Systems, ICVRIS 2020
Conference date: July 18, 2020 - July 19, 2020
Conference location: Zhangjiajie, China
Conference code: 171885
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to obtain the time history of wave load on slender vertical cylinder of offshore engineering platform, a method based on random wave theory is proposed. This method analyzes the action process of wave motion on slender vertical cylinder, linearizes the horizontal velocity of wave by using stochastic equivalent linearization method, and calculates the time history of wave load by target spectrum method. On this basis, through MATLAB software, combined with the calculation algorithm of wave load time history, the wave load calculation software is compiled, and the numerical simulation of wave load is completed. The simulation results show that the method can obtain the time history of wave load acting on the slender vertical cylinder of offshore engineering platform, which provides an effective method for the calculation of wave action on offshore engineering equipment. © 2020 IEEE.
Number of references: 7
Main heading: MATLAB
Controlled terms: Cylinders (shapes) - Numerical models - Simulation platform - Stochastic systems - Offshore oil well production
Uncontrolled terms: Method analysis - Numerical simulation - Offshore engineering - Random wave load - Random waves - Slende vertical cylinder - Vertical cylinders - Wave load - Wave motions - Wave theory
Classification code: 511.1 Oil Field Production Operations - 723.5 Computer Applications - 731.1 Control Systems - 921 Mathematics - 961 Systems Science
DOI: 10.1109/ICVRIS51417.2020.00079
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

216. Adsorption of CO, NO, and NH3 on ZnO monolayer decorated with noble metal (Ag, Au)

Accession number: 20200608129806
Authors: Qu, Yongfeng (1); Ding, Jijun (1); Fu, Haiwei (1); Peng, Jianhong (2); Chen, Haixia (1)
Author affiliation: (1) College of Science, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) College of Physics and Electronic Engineer, Qinghai Nationalities University, Xining; Qinghai; 810007, China
Corresponding author: Chen, Haixia(chxia8154@163.com)
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Issue date: 1 April 2020
Publication year: 2020
Article number: 145202
Language: English
ISSN: 01694332
CODEN: ASUSEE
Document type: Journal article (JA)

Publisher: Elsevier B.V., Netherlands
Abstract: The stable adsorption configuration, electronic structure and magnetic property of CO, NO, and NH3 adsorbed on pristine and noble metal (Ag, Au) atom decorated ZnO monolayer (ZnO-ML) are investigated using density functional theory (DFT). The results show that all three kind of gas molecules are physically absorbed on pristine ZnO-ML during the exothermic process. At the same time, the adsorption performance of the ZnO-ML is enhanced by doping noble metal (Ag, Au) atoms. Both Ag and Au atom doping can greatly enhance adsorption ability of the ZnO-ML to the CO and NO molecules, except for the NH3 molecules. For NO molecules, the adsorption energies of NO on the Ag, and Au atom decorated ZnO-ML are -0.92 eV and -1.30 eV, respectively, which are over 5 and 7 times larger than that of NO on the pristine ZnO-ML, respectively. Therefore, both the Ag, and Au atom decorated ZnO-ML are more sensitive for CO and NO molecules contrast to the ZnO-ML. These results provide insight into the adsorption properties of ZnO-ML, which could promote the further application of ZnO materials in the gas sensing field. © 2019 Elsevier B.V.
Number of references: 28
Main heading: Zinc oxide
Controlled terms: Atoms - Density functional theory - Monolayers - Adsorption - Ammonia - Electronic structure - Gold - II-VI semiconductors - Molecules
Uncontrolled terms: Adsorption ability - Adsorption energies - Adsorption performance - Adsorption properties - Exothermic process - Metal decoration - Stable adsorption - Theoretical calculations
Classification code: 547.1 Precious Metals - 712.1 Semiconducting Materials - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
DOI: 10.1016/j.apsusc.2019.145202
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

217. Optical fiber based on humidity sensor with improved sensitivity for monitoring applications

Accession number: 20202108705959
Authors: Bian, Ce (1); Wang, Jie (1); Bai, Xiaohong (1); Hu, Manli (1); Gang, Tingting (2)
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Corresponding author: Hu, Manli(huml@nwu.edu.cn)
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Issue date: October 2020
Publication year: 2020
Article number: 106342
Language: English
ISSN: 00303992
CODEN: OLTCAS
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: An optical fiber humidity sensor combined with a new type of moisture-sensitive material is proposed and experimentally demonstrated. The structure of the sensor is based on two single-mode fibers (SMFs) spliced on two sides of a no core fiber (NCF) and coated with a calcium alginate (CaAlg) hydrogel film. The NCF is regarded as the fiber core, and the CaAlg hydrogel film is regarded as the cladding. Through the etching of the fiber core and coating with film of the same thickness, an evanescent field is created to enable the sensitivity of the sensor to reach the highest value of 0.3774 dBm/%RH from the initial 0.0254 dBm/%RH. This operation allows the sensor to increase sensitivity while keeping the response time constant. The sensor was verified as being successfully applicable for

monitoring the humidity of an indoor environment for an entire day (24 h). Owing to its excellent stability, repeatability, and time response, the sensor has certain competitiveness in the field of medical storage and humidity monitoring of cultural relics. © 2020 Elsevier Ltd
Number of references: 29
Main heading: Etching
Controlled terms: Evanescent fields - Calcium - Humidity sensors - Hydrogels - Single mode fibers
Uncontrolled terms: Calcium alginate - Cultural relics - Humidity monitoring - Hydrogel films - Indoor environment - Moisture sensitive material - Monitoring applications - Response time constant
Classification code: 443.2 Meteorological Instrumentation - 549.2 Alkaline Earth Metals - 701 Electricity and Magnetism - 741.1.2 Fiber Optics - 801.3 Colloid Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally
Numerical data indexing: Time 8.64e+04s
DOI: 10.1016/j.optlastec.2020.106342
Funding Details: Number: 61377087, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

218. Intelligent Digital Currency and Dynamic Coding Service System Based on Internet of Things Technology (*Open Access*)

Accession number: 20210109728009
Authors: Li, Shanshen (1); Jing, Xin (2)
Author affiliation: (1) School of Economics and Management, Xi'an Shiyou University, Xi'an, Shaanxi; 710065, China; (2) Law School, Shanghai University of Finance and Economics, Shanghai; 200433, China
Corresponding author: Jing, Xin(jingxin@163.sufe.edu.cn)
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Volume: 2020
Issue date: 2020
Publication year: 2020
Article number: 6647039
Language: English
ISSN: 10762787
E-ISSN: 10990526
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: The amazing rise of digital currency is not only favored by investors but also attractive to lawbreakers for its anonymity and decentralization. This paper mainly discusses the intelligent digital currency and dynamic coding service system based on Internet of Things technology. In this paper, the RDCAR algorithm is used to realize the routing discovery process of the wireless network. When the intermediate node receives the RREQ message, first of all, to avoid the loop, it checks whether the same RREQ message has been introduced. If it has received it, it will discard it. Otherwise, it will cache the message and attach its own neighbor node list to the signal-To-noise ratio of the channel link, update the RREQ message, and broadcast it. The payment cipher is managed by the bank. When the user opens an account, the bank registers and sends it to the user. The key is generated by the algorithm chip, and the public key is kept in the bank background server. When the bill is delivered to the bank, the bank inputs all the elements on the bill on the counter terminal and transmits it to the verification machine for verification through the bank network. If the verification is correct, it indicates that the bill is indeed issued by the customer, and all bill elements are correct, and payment can be made. The node operation protocol of public chain and alliance chain maintains the operation of the Internet of Things system. The nodes of alliance chain generate new blocks according to the interval of 30 s. When the node fails to complete the block generation within 30 s, it will rotate to the next node. The mkfile command is used to generate 16b, 1 KB, 1 MB, and 1 GB files as input. The peak speed of the encoding service system is about 370 mb/s. The results show that the system designed in this study is robust and suitable for complex trading environment. © 2020 Shanshen Li and Xin Jing.
Number of references: 26
Main heading: Internet of things
Controlled terms: Electronic money - Signal to noise ratio - Web services

Uncontrolled terms: Dynamic coding - Intermediate node - Internet of things technologies - Public keys - Routing discovery - Service systems - Trading environments
Classification code: 716.1 Information Theory and Signal Processing - 722.3 Data Communication, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 723.5 Computer Applications
DOI: 10.1155/2020/6647039
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

219. Overview of distributed generation planning in electric distribution networks (*Open Access*)

Accession number: 20204809524071
Authors: Wu, Xiaomeng (1, 2); Shi, Zheng (1); Feng, Guo (1); Wang, Qianyu (1)
Author affiliation: (1) School of Electric Engineering, Xi'An Shiyou University, 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: J. Phys. Conf. Ser.
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Part number: 1 of 1
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Issue title: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
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Article number: 012114
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Dali, China
Conference code: 164232
Publisher: IOP Publishing Ltd
Abstract: As the proportion of distributed generation (DG) in the electric distribution network continues to increase, the intermittent characteristic of DG and uncertain load have many effects on electric distribution network planning and operation. Reasonable planning of DG in the electric distribution network can reduce network losses, improve power quality, reduce line transmission power, and improve system reliability. Unreasonable DG planning will cause problems such as waste of facilities, harmonic pollution and voltage fluctuations. Therefore, reasonable planning of DG has important practical significance. In this paper, the modeling of uncertain factors, the models of DG planning and optimization algorithms for solving planning models are introduced. The advantages and disadvantages of various algorithms are analyzed, and DG planning in electric distribution networks is more comprehensively reflected. © Published under licence by IOP Publishing Ltd.
Number of references: 14
Main heading: Distributed power generation
Controlled terms: Electric lines - Electric losses - Electric network parameters
Uncontrolled terms: Distributed generation planning - Harmonic pollution - Line transmissions - Optimization algorithms - Planning models - System reliability - Uncertain factors - Voltage fluctuations
Classification code: 703.1 Electric Networks - 706.1.2 Electric Power Distribution - 706.2 Electric Power Lines and Equipment
DOI: 10.1088/1742-6596/1634/1/012114
Funding Details: Number: S201910705070, Acronym: -, Sponsor: -;
Funding text: This paper was supported by Xi'an Shiyou University Graduate Innovation and Practice Ability Training Project, and Undergraduate Training Programs for Innovation and Entrepreneurship of Shaanxi Province(S201910705070).This paper was supported by Xi an Shiyou University Graduate Innovation and Practice

Ability Training Project, and Undergraduate Training Programs for Innovation and Entrepreneurship of Shaanxi Province(S201910705070).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

220. Research on Coordinated Optimization of Active and Reactive Power in Active Distribution Network (*Open Access*)

Accession number: 20204809524069
Authors: Wu, Xiaomeng (1, 2); Li, Chong (1)
Author affiliation: (1) School of Electric Engineering, Xi'An Shiyou University, China; (2) Key Laboratory of Measurement and Control Technique of Oil and Gas Wells of Shaanxi Province xi'An, China
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1634
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Issue: 1
Issue title: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Issue date: October 13, 2020
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Article number: 012112
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Dali, China
Conference code: 164232
Publisher: IOP Publishing Ltd
Abstract: Traditional optimization for distribution network usually uses reactive power optimization to ensure the safe operation of the distribution network, and uses the distributed power and various adjustable resources of active power adjustment to ensure the economic operation of the distribution network. However, in the distribution network, the impedance ratio of the line is large and the coupling of active and reactive power is strong. Unilateral active or reactive optimization for distribution network is not comprehensive. In addition, the uncertainty of Distributed Generation and load poses a great challenge to optimization for active distribution network, the control strategy formulated by traditional deterministic optimization might inaccurate. In this paper, the mathematical model of active and reactive power coordinated optimization for active distribution network is given. Various algorithms dealing with the uncertainty of distribution are introduced, and advantages and disadvantages of various algorithms are analysed. © Published under licence by IOP Publishing Ltd.
Number of references: 14
Main heading: Uncertainty analysis
Controlled terms: Reactive power - Optimization
Uncontrolled terms: Active and Reactive Power - Active distribution networks - Control strategies - Coordinated optimization - Deterministic optimization - Economic operations - Reactive optimization - Reactive power optimization
Classification code: 921.5 Optimization Techniques - 922.1 Probability Theory
DOI: 10.1088/1742-6596/1634/1/012112
Funding Details:
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

221. Effect of horizontal plate length on working resistance of blade under different cutting rake angles

Accession number: 20204809552711
Authors: He, Yutian (1, 2); Lu, Pengmin (2); Guo, Longlong (1); Wu, Wen (2)
Author affiliation: (1) School of Mechanical Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) Key Laboratory of Road Construction and Equipment of MOE, Chang'An University, Xi'an; 710064, China
Source title: Proceedings - 2020 5th International Conference on Electromechanical Control Technology and Transportation, ICECTT 2020
Abbreviated source title: Proc. - Int. Conf. Electromechanical Control Technol. Transp., ICECTT
Part number: 1 of 1
Issue title: Proceedings - 2020 5th International Conference on Electromechanical Control Technology and Transportation, ICECTT 2020
Issue date: May 2020
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Pages: 141-144
Article number: 9237554
Language: English
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Document type: Conference article (CA)
Conference name: 5th International Conference on Electromechanical Control Technology and Transportation, ICECTT 2020
Conference date: May 15, 2020 - May 17, 2020
Conference location: Virtual, Nanchang, China
Conference code: 164345
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Working resistance of blades is influenced remarkably by cutting rake angle during soil cutting and bulldozing process. In order to further reduce the effect of the working resistance on soil cutting and bulldozing, the blades with horizontal plates in three different lengths were developed. Self-designed experiment system was used to carry out soil cutting and bulldozing. Twelve groups of soil cutting and bulldozing tests were completed with four different cutting rake angles under cutting depth of 90mm in grading soil. The results show that the blades with horizontal plates can reduce the working resistance when the cutting rake angle is greater than a certain valve. There is more significant effect on the working resistance when the soil cutting and bulldozing are under larger cutting rake angles, and it would be have adverse influence when the cutting rake angle is less than 45 degree. In addition, the length of the horizontal plate has an optimal value to minimize the working resistance under different cutting rake angles. Therefore, it is a feasible way to reduce the working resistance by designing the blades with horizontal plates for earthmoving machine under certain conditions. © 2020 IEEE.
Number of references: 12
Main heading: Soils
Controlled terms: Grading
Uncontrolled terms: Cutting depth - Designed experiments - Earth moving machines - Horizontal plates - Optimal values - Rake angle - Soil cuttings
Classification code: 483.1 Soils and Soil Mechanics
Numerical data indexing: Size 9.00e-02m
DOI: 10.1109/ICECTT50890.2020.00039
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

222. Research on Optimal Dispatch of Active Distribution Network with Distributed Energy Storage (*Open Access*)

Accession number: 20204809524078
Authors: Wu, Xiaomeng (1, 2); Dang, Jian (1); Ren, Fu (1); Wang, Shangkun (1)
Author affiliation: (1) School of Electric Engineering, Xi'An Shiyou University, China; (2) Key Laboratory of Measurement and Control Technique of Oil and Gas Wells of Shaanxi Province xi'An, China
Source title: Journal of Physics: Conference Series

Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1634
Part number: 1 of 1
Issue: 1
Issue title: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
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Publication year: 2020
Article number: 012121
Language: English
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Document type: Conference article (CA)
Conference name: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Dali, China
Conference code: 164232
Publisher: IOP Publishing Ltd
Abstract: In order to alleviate the energy crisis and improve environmental quality, the efficient use of renewable energy has become a development trend. In order to integrate various types of distributed generation (Distributed Generation, DG), to achieve large-scale renewable energy consumption, improve the utilization efficiency of distribution network resources, and improve the reliability and power quality of users, active distribution network technology has come into being, and it has attracted more and more attention from researchers. As an important part of the active distribution network, distributed energy storage has the advantages of centralized energy storage that can achieve independent control and "plug and play", wide geographical distribution, flexibility and convenience. At the same time, because energy storage has power and the dual characteristics of load, using it to participate in the optimal dispatching of the distribution network, can effectively reduce the operating cost of the distribution network and to a certain extent realize the peak cut and valley filling of the power grid, and improve the power quality of the distribution network. © Published under licence by IOP Publishing Ltd.
Number of references: 11
Main heading: Energy utilization
Controlled terms: Distributed power generation - Geographical distribution - Energy efficiency - Quality control - Power quality - Electric power transmission networks - Electric load dispatching - Energy policy - Energy storage
Uncontrolled terms: Active distribution networks - Distributed energy storages - Environmental quality - Independent control - Reliability and power qualities - Renewable energy consumption - Use of renewable energies - Utilization efficiency
Classification code: 405.3 Surveying - 525.2 Energy Conservation - 525.3 Energy Utilization - 525.6 Energy Policy - 525.7 Energy Storage - 706.1.1 Electric Power Transmission - 706.1.2 Electric Power Distribution - 902.1 Engineering Graphics - 913.3 Quality Assurance and Control
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Funding text: This paper was supported by Xi an Shiyou University Graduate Innovation and Practice Ability Training Project and Undergraduate Training Programs for Innovation and Entrepreneurship of Shaanxi Province(S201910705070)This paper was supported by Xi'an Shiyou University Graduate Innovation and Practice Ability Training Project and Undergraduate Training Programs for Innovation and Entrepreneurship of Shaanxi ProvinceS201910705070.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

223. The lattices of monadic filters in monadic BL-algebras

Accession number: 20203709178750
Authors: Wang, Juntao (1); Wang, Mei (2)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Xi'an, Shannxi; 710065, China; (2) School of Arts and Sciences, Shaanxi University of Science and Technology, Xian; 710021, China
Corresponding author: Wang, Juntao(wjt@xsyu.edu.cn)
Source title: IAENG International Journal of Applied Mathematics

Abbreviated source title: IAENG Int. J. Appl. Math.
Volume: 50
Issue: 3
Issue date: 2020
Publication year: 2020
Pages: 656-660
Language: English
ISSN: 19929978
E-ISSN: 19929986
Document type: Journal article (JA)
Publisher: International Association of Engineers
Abstract: In this paper, we focus on lattice structures of the set of monadic filters (monadic filters, stable monadic filters, involutory monadic filters) of monadic BL-algebras and prove that (a) the classes of all monadic filters in monadic BL-algebras forms a complete Heyting algebras with respect to inclusion; (b) the class of all stable monadic filters relative a monadic filter F in monadic BL-algebras is a complete Boolean algebra with respect to inclusion; (c) the class of all involutory monadic filters relative a monadic filter F in monadic BL-algebras is a complete Boolean algebra with respect to inclusion. These results also provide the solid foundation to study the variety of monadic BL-algebras. © 2020 International Association of Engineers.
Number of references: 16
Main heading: Boolean algebra
Controlled terms: C (programming language)
Uncontrolled terms: BL-algebra - Heyting algebras - Lattice structures
Classification code: 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 723.1.1 Computer Programming Languages - 921.1 Algebra
Funding Details: Number: 20JK0626, Acronym: -, Sponsor: -; Number: 11926501,11961016,61976244, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2020JQ-762, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: Manuscript received January 31, 2020; revised June 27, 2020. This work is supported by a grant of National Natural Science Foundation of China (No. 61976244, No. 11961016 and No. 11926501), the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2020JQ-762) and the Natural Science Foundation of Education Committee of Shannxi Province (No. 20JK0626).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

224. Application of a cascading filter implemented using morphological filtering and time–frequency peak filtering for seismic signal enhancement

Accession number: 20201708503190
Authors: Liu, Yanping (1, 2); Yan, Zhengguo (1, 2)
Author affiliation: (1) College of Electronic Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Key Laboratory of Oil and Gas Well Measurement and Control Technology in Shaanxi, Xi'an; Shaanxi; 710065, China
Corresponding authors: Liu, Yanping(liuyp@xsyu.edu.cn); Liu, Yanping(liuyp@xsyu.edu.cn)
Source title: Geophysical Prospecting
Abbreviated source title: Geophys. Prospect.
Volume: 68
Issue: 6
Issue date: July 1, 2020
Publication year: 2020
Pages: 1727-1741
Language: English
ISSN: 00168025
E-ISSN: 13652478
CODEN: GPPRAR
Document type: Journal article (JA)
Publisher: Blackwell Publishing Ltd
Abstract: Inspired by the idea of the iterative time–frequency peak filtering, which applies time–frequency peak filtering several times to improve the ability of random noise reduction, this article proposes a new cascading filter implemented using mathematic morphological filtering and the time–frequency peak filtering, which we call here morphological time–

frequency peak filtering for convenience. This new method will be used mainly for seismic signal enhancement and random noise reduction in which the advantages of the morphological algorithm in processing nonlinear signals and the time–frequency peak filtering in processing nonstationary signals are utilized. Structurally, the scheme of the proposed method adopts mathematic morphological operation to first preprocess the signal and then applies the time–frequency peak filtering method to ultimately extract the valid signal. Through experiments on synthetic seismic signals and field seismic data, this paper demonstrates that the morphological time–frequency peak filtering method is superior to the time–frequency peak filtering method and its iterative form in terms of valid signal enhancement and random noise reduction. © 2020 European Association of Geoscientists & Engineers
Number of references: 56
Main heading: Seismology
Controlled terms: Seismic waves - Signal denoising - Iterative methods
Uncontrolled terms: Mathematic morphological - Mathematic morphological filtering - Morphological algorithms - Morphological filtering - Nonlinear signals - Nonstationary signals - Random noise reductions - Signal enhancement
Classification code: 484 Seismology - 484.1 Earthquake Measurements and Analysis - 716.1 Information Theory and Signal Processing - 921.6 Numerical Methods
DOI: 10.1111/1365-2478.12947
Funding Details: Number: S2018-JC-QN-1235, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 41704106, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work is supported by the National Natural Science Foundation of China with Grant No. 41704106 and by the Basic Research Plan of Natural Science in Shaanxi Province with Grant No. S2018-JC-QN-1235.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

225. Degradation of hydroxypropyl guar gum at wide pH range by a heterogeneous Fenton-like process using bentonite-supported Cu(0) (*Open Access*)

Accession number: 20204609489040
Authors: Zhou, Ling (1); Xu, Zhongying (1); Zhang, Jie (1, 2); Zhang, Zhifang (3); Tang, Ying (1, 4)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'An Shiyou University, Xi'an Shaanxi; 710065, China; (2) Shanxi Prov. Key Lab. of Environ. Pollution Control and Reservoir Protection Technology of Oilfields, Xi'An Shiyou University, Xi'an Shaanxi; 710065, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing; 102206, China; (4) School of Chemistry and Chemical Engineering, Yulin University, Yulin; 719000, China
Corresponding author: Tang, Ying(tangying78@xsyu.edu.cn)
Source title: Water Science and Technology
Abbreviated source title: Water Sci. Technol.
Volume: 82
Issue: 8
Issue date: October 15, 2020
Publication year: 2020
Pages: 1635-1642
Language: English
ISSN: 02731223
E-ISSN: 19969732
CODEN: WSTED4
Document type: Journal article (JA)
Publisher: IWA Publishing
Abstract: To seek for efficient Fenton-like oxidation processing for treatment of waste fracturing fluid containing hydroxypropyl guar gum (HPGG), in heterogeneous reaction, five bentonite-supported zero-valent metal catalysts were prepared by liquid-phase reduction. The results showed that the bentonite-supported zero-valent copper exhibited best catalytic performance, attributed to the high dispersion of active sites of zero-valent copper. The effects of the most relevant operating factors (H2O2concentration, catalyst dosage, temperature and pH) were evaluated in detail. Moreover, the chemical oxygen demand removal rate of HPGG can achieve 76% when the reaction time was selected at 45 min under optimal experimental conditions. The stability evaluation showed that the catalytic performance was almost unaffected after the catalyst was recycled and used once more showing the good stability of the bentonite-supported zero-valent copper in the application process. © 2020 IWA Publishing. All rights reserved.
Number of references: 36

Main heading: Bentonite
Controlled terms: Catalysts - Waste treatment - Chemical oxygen demand - Copper - Oxidation
Uncontrolled terms: Catalytic performance - Chemical oxygen demand removals - Heterogeneous fenton - Heterogeneous reactions - Hydroxypropyl guars - Optimal experimental conditions - Stability evaluation - Zero-valent coppers
Classification code: 452.4 Industrial Wastes Treatment and Disposal - 482.2 Minerals - 544.1 Copper - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
Numerical data indexing: Percentage 7.60e+01%, Time 2.70e+03s
DOI: 10.2166/wst.2020.436
Funding Details: Number: YCS18211017, Acronym: -, Sponsor: -; Number: 2019GY-136, Acronym: -, Sponsor: -; Number: 201805038YD16CG22, Acronym: -, Sponsor: -; Number: 21763030, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This work was financially supported by National Science Foundation of China (No. 21763030), Scientific Research Plan Projects of Shaanxi Science and Technology Department (2019GY-136), Xi'an Science and Technology Project (201805038YD16CG22(3)) and Postgraduate Innovation and Practical Ability Training Project of Xi'an Shiyou University (YCS18211017). And we thanks the work of Modern Analysis and Testing Center of Xi'an Shiyou University.This work was financially supported by National Science Foundation of China (No. 21763030), Scientific Research Plan Projects of Shaanxi Science and Technology Department (2019GY-136), Xi'an Science and Technology Project (201805038YD16CG22(3)) and Postgraduate Innovation and Practical Ability Training Project of Xi'an Shiyou University (YCS18211017). And we thanks the work of Modern Analysis and Testing Center of Xi'an Shiyou University.
Compendex references: YES
Open Access type(s): All Open Access, Hybrid Gold
Database: Compendex
Data Provider: Engineering Village

226. Establishment and application of big data processing platform

Accession number: 20205109638806
Authors: Liu, Ruixia (1, 2); Zhang, Qizhi (1, 2)
Author affiliation: (1) Xi'An Shiyou University, School of Electrical Engineering, China; (2) Shaanxi Provincial Key Lab of Oil and Gas Well, Measurement and Control Technology, Xi an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
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Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Issue date: September 2020
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Article number: 9239754
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: With the advent of the era of big data, more and more enterprises begin to use big data technology to deal with related analysis work. Hadoop is the dominant processing platform in the field of big data, an ecosystem that integrates distributed computing, storage, and management. The Spark framework, on the other hand, is a faster, more versatile distributed computing platform. However, it is only a computing platform and does not provide distributed storage and management per se, and computing remains dependent on distributed file system HDFS and cluster Resource Manager Yarn in the Hadoop ecosystem. Therefore, the combination of Spark and Hadoop to build a big data processing platform can better improve the algorithm efficiency and processing scale. This article explains the

setup process and running state of Hadoop and Spark in detail, and verifies its feasibility through several ways. © 2020 IEEE.
Number of references: 8
Main heading: Big data
Controlled terms: Data handling - Digital storage - Ecosystems - File organization - Cluster computing - Information management
Uncontrolled terms: Algorithm efficiency - Computing platform - Data technologies - Distributed computing platform - Distributed file systems - Distributed storage - Processing platform - Resource managers
Classification code: 454.3 Ecology and Ecosystems - 722.1 Data Storage, Equipment and Techniques - 722.4 Digital Computers and Systems - 723.2 Data Processing and Image Processing - 903.3 Information Retrieval and Use
DOI: 10.1109/ICCNEA50255.2020.00035
Funding Details: Number: 2017ZDXM-GY-097, Acronym: -, Sponsor: -;
Funding text: This research is supported by the Postgraduate innovation and Practice Ability training project of Xi'an Shiyou University and the Science and Technology key project of Shaanxi Province, "Development of Rigid Control Virtual Simulation Software" (2017ZDXM-GY-097).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

227. Biomass-derived N-doped porous two-dimensional carbon nanosheets supported ruthenium as effective catalysts for the selective hydrogenation of quinolines under mild conditions (*Open Access*)

Accession number: 20202208761059
Authors: Cao, Yueling (1); Ding, Liang (2); Qiu, Zegang (2); Zhang, Hepeng (1)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Northwestern Polytechnical University, Xi'an; 710072, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Qiu, Zegang(qiuzegang@xsyu.edu.cn)
Source title: Catalysis Communications
Abbreviated source title: Catal. Commun.
Volume: 143
Issue date: 5 August 2020
Publication year: 2020
Article number: 106048
Language: English
ISSN: 15667367
CODEN: CCAOAC
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Biomass-derived N-doped porous two-dimensional carbon nanosheets (NPCNs) with high surface area and pore volume were fabricated by using graphitic carbon nitride (g-C3N4) as both template and nitrogen source. The NPCNs were found to be promising supports to immobilize Ru nanoparticles (Ru/NPCNs), and Ru/NPCNs exhibit excellent catalytic performance for quinoline hydrogenation. 98.3% conversion and 96.1% selectivity were obtained within 3.5 h at 40 °C and 1 MPa H2, which is far better than traditionally materials supported Ru catalysts. This work may provide a new choice for the synthesis of porous two-dimensional carbon nanosheets that can be used as catalyst support. © 2020 Elsevier B.V.
Number of references: 35
Main heading: Catalyst supports
Controlled terms: Carbon nitride - Nanosheets - Catalyst selectivity - Doping (additives) - Nanocatalysts - Hydrogenation - Ruthenium
Uncontrolled terms: Carbon nanosheets - Catalytic performance - High surface area - Nitrogen sources - Pore volume - Ru catalysts - Ru nanoparticles - Selective hydrogenation
Classification code: 547.1 Precious Metals - 761 Nanotechnology - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 933 Solid State Physics
Numerical data indexing: Percentage 9.61e+01%, Percentage 9.83e+01%, Temperature 3.13e+02K, Time 1.26e+04s
DOI: 10.1016/j.catcom.2020.106048
Funding Details: Number: 2019A1515110507, Acronym: -, Sponsor: -; Number: 2019JQ-106, Acronym: -, Sponsor: Natural Science Foundation of Shanghai; Number: 2018JM2028,21878243, Acronym: NSFC, Sponsor: National

Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
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Compendex references: YES
Open Access type(s): All Open Access, Hybrid Gold
Database: Compendex
Data Provider: Engineering Village

228. Numerical Simulation of Constricted Sheet Tungsten Electrode Arc Characteristic with Insulating Solid Wall in Ultra Narrow Gap Welding Process (*Open Access*)

Accession number: 20201508385352
Title of translation:
Authors: Li, Yuanbo (1); Yang, Tao (2); Zheng, Shaoxian (1); Zhao, Xilong (1)
Author affiliation: (1) School of Materials Science and Engineering, Lanzhou Jiaotong University, Lanzhou; 730070, China; (2) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Jixie Gongcheng Xuebao/Journal of Mechanical Engineering
Abbreviated source title: Jixie Gongcheng Xuebao
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Publication year: 2020
Pages: 69-76 and 85
Language: Chinese
ISSN: 05776686
CODEN: CHHKA2
Document type: Journal article (JA)
Publisher: Chinese Mechanical Engineering Society
Abstract: The TIG arc characteristics in ultra narrow gap could be changed by the combined regulation of sheet tungsten electrode and insulating solid wall for avoiding lack of fusion on the corner of square groove. For understanding the regulation mechanism of constricted sheet tungsten electrode arc characteristic with insulating solid wall in ultra narrow gap welding, the three-dimensional quasi-steady state mathematical model of constricted sheet tungsten electrode arc characteristic with insulating solid wall in ultra narrow gap welding process is presented based on a set of partial differential equations and reasonable boundaries conditions. The distributions of temperature, velocity and current density of constricted arc in ultra narrow gap welding process are obtained with different constricted effect of insulating solid wall. The results show that the temperature field, flow field and electric field of constricted sheet tungsten electrode arc with insulating solid wall in ultra narrow gap welding process are symmetric at width direction of ultra narrow gap groove; the insulating solid wall would change the characteristics of constricted arc by cathode and anode control effect; the different constricted height could provide combined regulation of cathode and anode control effect, by which the maximum current density, temperature and plasma velocity of constricted arc enhanced; meanwhile this combined regulation would also restrict the flow of arc current on the side; the variation of constricted width would only bring about cathode control effect to take greater current density, temperature and plasma velocity of constricted arc, and the flow of arc current on the side could not be avoided; when the cathode and anode control effects are stronger, the higher temperature region, current density and cathode jet of constricted arc in ultra narrow gap groove could shift further to the location of sheet tungsten electrode with smaller discharge gap. © 2020 Journal of Mechanical Engineering.
Number of references: 15
Main heading: Current density
Controlled terms: Cathodes - Anodes - Tungsten - Insulation - Electric arcs
Uncontrolled terms: Arc characteristics - Maximum current density - Narrow gap welding - Quasi-steady state - Regulation mechanisms - Temperature regions - Tungsten electrodes - Ultra-narrow-gap grooves
Classification code: 413 Insulating Materials - 543.5 Tungsten and Alloys - 701.1 Electricity: Basic Concepts and Phenomena - 714.1 Electron Tubes
DOI: 10.3901/JME.2020.02.069
Compendex references: YES
Open Access type(s): All Open Access, Bronze

Database: Compendex
Data Provider: Engineering Village

229. Tight tuff reservoir characteristics and its controlling factors: A comparative study of the Permian Tiaohu Formation and Carboniferous Haerjiawu Formation in the Santanghu Basin, NW China

Accession number: 20200107969074
Authors: Ma, Jian (1, 3); Liu, Guoheng (2); Huang, Zhilong (3); Ou, Guangxi (1); Li, Tianjun (3); Guo, Xiaobo (4, 5)
Author affiliation: (1) Beijing Research Institute of Uranium Geology, Beijing; 100029, China; (2) Oil and Gas Survey, China Geological Survey, Beijing; 100083, China; (3) State Key Laboratory of Petroleum Resource and Prospecting, China University of Petroleum, Beijing; 102249, China; (4) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (5) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Ma, Jian(202majian@163.com)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 187
Issue date: April 2020
Publication year: 2020
Article number: 106808
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Tight oil resources have been found in tight tuff reservoirs in many oil and gas bearing basins. The tight tuff reservoir developed in the Santanghu Basin (NW China) has provided an excellent opportunity for further research to enhance our cognition and understanding of tuff reservoir characteristics. This study focuses on the differences in the basic characteristics in petrologic features, reservoir space, and physical properties between the Tiaohu and Haerjiawu formations tuff reservoirs, then determines the formation mechanism causing these differences. (1) The tuff samples of the Tiaohu Formation mainly consist of vitric fragments, and quartz and albite are the major mineralogical components. However, the crystal fragment content is much higher in the Haerjiawu Formation tuff, and albite and anorthite are the major components. (2) Primary pores and the interparticle pores among authigenic minerals formed during alteration are the main pore types for both the Tiaohu Formation and Haerjiawu Formation tuffS. (3) The Tiaohu Formation tuff reservoir is characterized by high porosity (ranging from 10% to 25%) and relatively low permeability (on the order of 0.01–0.50 mD), while that of the Haerjiawu Formation is characterized by lower porosity (© 2019 Elsevier B.V.
Number of references: 79
Main heading: Volcanoes
Controlled terms: Petroleum reservoir engineering - Pore size - Oil bearing formations - Compaction - Feldspar
Uncontrolled terms: Alteration - Basic characteristics - Comparative studies - Controlling factors - Formation mechanism - Haerjiawu Formation - Reservoir characteristic - Santanghu Basin
Classification code: 482.2 Minerals - 484 Seismology - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 1.00e+01% to 2.50e+01%
DOI: 10.1016/j.petrol.2019.106808
Funding Details: Number: 2017M611109, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 41472111, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This research was supported financially by the National Natural Science Foundation of China (No.: 41472111) and the China Postdoctoral Science Foundation (No.: 2017M611109). The authors thank the PetroChina Turpan-Hami Oilfield Company for providing valuable geological data, as well as the crude oil and core samples. Appendix A
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

230. Development and design of detachable deep hole variable diameter boring tool device (*Open Access*)

Accession number: 20204809532057
Authors: Liu, Zhanfeng (1); Wang, Kun (1); Feng, Yazhou (1); Li, Zhanhui (1)
Author affiliation: (1) Department of Mechanical Engineering, Xi'an Petroleum University, Xi'an, Shaanxi, China
Corresponding author: Wang, Kun(413879566@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1653
Part number: 1 of 1
Issue: 1
Issue title: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar
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Article number: 12049
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar, ICAMIM 2020
Conference date: August 21, 2020 - August 23, 2020
Conference location: Guilin, China
Conference code: 164482
Publisher: IOP Publishing Ltd
Abstract: In order to solve the problem of deep hole processing, the inner reaming of small ends and large middle is difficult to process. Developed and designed a detachable deep hole variable diameter boring tool device with self-centering, replaceable tools, and capable of changing the same diameter of the guide block and the tool and with self-locking function. Introduce in detail the structural features, assembly conditions and design principles of the detachable deep hole variable diameter boring cutter device. It provides an effective solution for the processing of inner reaming in deep holes. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 7
Main heading: Boring tools
Uncontrolled terms: Assembly condition - Deep hole processing - Design Principles - Effective solution - Self centering - Selflocking - Structural feature - Variable diameter
Classification code: 603.1 Machine Tools, General
DOI: 10.1088/1742-6596/1653/1/012049
Funding Details: Number: YCS19121009, Acronym: -, Sponsor: -;
Funding text: Xi'an Shiyou University Postgraduate Innovation and Practice Ability Cultivation Funding Project (No. YCS19121009)
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

231. Natural scene text detection based on YOLO V2 network model (*Open Access*)

Accession number: 20204809523969
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1634
Part number: 1 of 1
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Issue title: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Issue date: October 13, 2020
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Article number: 012013

Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Dali, China
Conference code: 164232
Publisher: IOP Publishing Ltd
Abstract: As an important part in the field, the natural scene text detection has been widely applied in visual navigation system, content-based image and video retrieval, instant translation system and so on. In this paper, we introduce several object detection network based on deep learning, and apply the YOLO v2 into natural scene text detection, changing the multi objects detection problems into the two classification problems. The main works in the paper include the following: prepare the datasets; we train the YOLO v2 with the optimum parameters, carry out the regression analysis of the coordinate parameters and categories of bounding boxes, obtain the detection result; according to different detection models, the detection results of different datasets are compared and analyzed, YOLO V2 model detection speed 0.105s/image has certain advantages. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Object detection
Controlled terms: Search engines - Regression analysis - Text processing - Navigation systems - Deep learning
Uncontrolled terms: Content based images - Detection models - Detection networks - Detection speed - Network modeling - Optimum parameters - Translation systems - Visual navigation systems
Classification code: 461.4 Ergonomics and Human Factors Engineering - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis - 903.3 Information Retrieval and Use - 922.2 Mathematical Statistics
DOI: 10.1088/1742-6596/1634/1/012013
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

232. Matrix-assisted nanoelectrospray mass spectrometry for soft ionization of metal(i)-protein complexes

Accession number: 20201008266865
Authors: Li, Jin (1); Zheng, Yajun (1); Zhao, Jia (1); Austin, Daniel E. (2); Zhang, Zhiping (1)
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Source title: Analyst
Abbreviated source title: Analyst
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Publication year: 2020
Pages: 1646-1656
Language: English
ISSN: 00032654
E-ISSN: 13645528
CODEN: ANALAO
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Metal ions play significant roles in biological processes, and investigation of metal-protein interactions provides a basis to understand the functions of metal ions in such systems. In the current study, a novel matrix-assisted nanoelectrospray ionization mass spectrometry (MANESI-MS) method was developed for investigating the interactions between metal ions (i.e., Cu+) and protein molecules (i.e., myoglobin) using Cu nanoparticles as the matrix. The results demonstrated that the present method not only was an efficient strategy for the generation of various complexes with monovalent metal ions, such as Cu+, in which no redox transitions between Cu+ and Cu2+

were observed, but also allowed a softer ionization of the generated Cu+-myoglobin complexes compared to that of myoglobin molecules with conventional nanoESI. Several parameters (i.e., the mixing mode of the myoglobin sample and Cu nanoparticle solution, size of the Cu particle, oxidation state of the Cu species, and acidity of the myoglobin solution) were found to be crucial in determining the ionization efficiency of the MANESI method. First loading a Cu nanoparticle solution into the electrospray tip followed by a myoglobin solution resulted in a favorable interaction between the generated Cu+ ions and myoglobin molecules, in which a smaller size of the Cu particle and a lower oxidation state of the metal species (Cu > Cu2O > CuO) gave a lower average charge state and hence a softer ionization of the resulting Cu+-myoglobin complexes, possibly due to the reduced denaturing effects of the Cu + complex. The MANESI method has also been successfully used to ionize the complexes between Cu+ and other biological molecules such as cytochrome c and angiotension II, although an exception was found for lysozymes, which show an increase in the charge state. Analogous to the study with Cu, a variety of other metal nanoparticles (Ni, Fe, W, Ag, Al, Zn and Co) were explored to study their interactions with myoglobin, but only Zn and Co could produce monovalent metal ions (i.e., Zn+ and Co+) followed by a favorable interaction with myoglobin, and a soft ionization of the resulting complexes. © The Royal Society of Chemistry 2020.
Number of references: 51
Main heading: Metal ions
Controlled terms: Copper oxides - Ionization - Mass spectrometry - Metal nanoparticles - Molecules - Proteins - Zinc
Uncontrolled terms: Biological process - Cu nano-particles - Favorable interactions - Matrix assisted - Metals ions - Monovalent metal ion - Nanoelectrospray - Nanoparticle solutions - Protein complexes - Soft ionization
Classification code: 531.1 Metallurgy - 546.3 Zinc and Alloys - 761 Nanotechnology - 801 Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 931.3 Atomic and Molecular Physics
DOI: 10.1039/c9an02117e
Funding Details: Number: 21575112,21705125,21777128, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JC-33, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: We are grateful for funding from the National Natural Science Foundation of China (No. 21575112, 21777128 and 21705125) and the Natural Science Basic Research Program of Shaanxi Province of China (Grant No. 2019JC-33).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

233. Atomic diffusion behavior and diffusion mechanism in Fe-Cu bimetal casting process studied by molecular dynamics simulation and experiment (*Open Access*)

Accession number: 20204209352864
Authors: Zhang, Guowei (1); Kang, Yuanyuan (1); Wang, Mingjie (1); Xu, Hong (1); Jia, Hongmin (2)
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Corresponding author: Zhang, Guowei(1125593238@qq.com)
Source title: Materials Research Express
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Volume: 7
Issue: 9
Issue date: September 2020
Publication year: 2020
Article number: abb90f
Language: English
E-ISSN: 20531591
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: A molecular dynamics (MD) method with an embedded atomic method (EAM) was proposed to study the atomic diffusion behavior and diffusion mechanism in the Fe-Cu bimetal casting process. The results indicated that the diffusion coefficient of the Cu atoms was larger than that of the Fe atoms at the same temperature, but the Fe atoms predominantly diffused into the Cu side in the process of diffusion bonding. Moreover, the relationship between diffusion distance and temperature was predicted by the established model, and the optimal temperature for interface diffusion bonding of Fe-Cu bimetal ranged from 1473K to 1753 K. The diffusion behavior was mainly due to vacancies, which played a key role in the formation of the Cu cluster, and the accumulation of Cu atoms decreased the system

energy. Finally, FeAcknowledgmentsCu bimetal casting was prepared to validate the simulated results of the diffusion behavior and diffusion distance, and the simulated results were consistent with the experimental ones. © 2020 The Author(s). Published by IOP Publishing Ltd
Number of references: 29
Main heading: Molecular dynamics
Controlled terms: Diffusion bonding - Copper alloys - Iron - Diffusion in solids - Copper - Atoms - Binary alloys
Uncontrolled terms: Diffusion behavior - Diffusion distance - Diffusion mechanisms - Embedded atomic methods - Interface diffusion - Molecular dynamics methods - Molecular dynamics simulations - Optimal temperature
Classification code: 544.1 Copper - 544.2 Copper Alloys - 545.1 Iron - 801.4 Physical Chemistry - 931.3 Atomic and Molecular Physics
Numerical data indexing: Temperature 1.47e+03K to 1.75e+03K
DOI: 10.1088/2053-1591/abb90f
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

234. Experimental investigations of fracturing fluid flowback and retention under forced imbibition in fossil hydrogen energy development of tight oil based on nuclear magnetic resonance

Accession number: 20201508393416
Authors: Xu, Guoqing (1); Jiang, Yun (2); Shi, Yang (2); Han, Yujiao (1); Wang, Mingxian (3); Zeng, XingHang (1)
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Abbreviated source title: Int J Hydrogen Energy
Volume: 45
Issue: 24
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Publication year: 2020
Pages: 13256-13271
Language: English
ISSN: 03603199
CODEN: IJHEDX
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Experimental works have proved that imbibition under forced pressure (FP, the difference between hydraulic fluid pressure and original pore pressure) has a positive effect on fossil hydrogen energy development in tight oil reservoir. However, the knowledge of the influence of imbibition under forced pressure (forced imbibition, FI) on fracturing fluid flowback and water retention is still limited. In this paper, experiments were designed and conducted to reveal the mechanism of fracturing fluid flowback and water retention under imbibition effect in tight sandstones. As a comparison, unconsolidated sandstones were also investigated in this study. Core samples were divided into two categories: the imbibition ones (treated by imbibition) and the filtration ones (treated by displacement), in accordance with the real oil-water distribution after well shut-in. An imbibition core and a filtration core were stitched together to conduct a flowback experiment. During the experiment, fluid distribution in different pore sizes was monitored continuously by using a low-field nuclear magnetic resonance device. Results show that the flowback recovery in tight sandstones is much lower than that in unconsolidated sandstones due to the difference of pore structure. Meanwhile, forced imbibition leads to higher oil recovery than spontaneous imbibition (SI) in tight sandstones since forced pressure enhances water imbibition. The water imbibed into small-macro and macro pores contributes the major flowback recovery, but the imbibed water in micro pores is rather difficult to displace and finally retains in these pores during the flowback process. Overall, forced imbibition not only enhances oil recovery but also increases water retention, explaining the mechanism of well productivity increase by using the shut-in method in the field. This study can help to clarify the influence of forced imbibition on fracturing fluid flowback and enhancement of fossil hydrogen development, and further provide guidance for flowback designs. © 2020 Hydrogen Energy Publications LLC
Number of references: 44
Main heading: Nuclear magnetic resonance

Controlled terms: Pore size - Water supply systems - Water treatment - Fracturing fluids - Oil well flooding - Pore structure - Sandstone - Water filtration - Magnetism - Petroleum reservoir engineering - Petroleum reservoirs
Uncontrolled terms: Different pore sizes - Experimental investigations - Fluid distribution - Fracturing fluid flowback - Low field nuclear magnetic resonance - Oil-water distribution - Spontaneous imbibition - Well productivity
Classification code: 445.1 Water Treatment Techniques - 446.1 Water Supply Systems - 482.2 Minerals - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 701.2 Magnetism: Basic Concepts and Phenomena - 802.3 Chemical Operations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.ijhydene.2020.03.054
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Funding text: The authors would express their appreciation to National Science and Technology Major Project (NO. 2016ZX05046004) for funding this study.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

235. Numerical study on the effect of dissymmetry heating on flow instability of supercritical water in two parallel channels

Accession number: 20202208740928
Authors: Liu, Jialun (1); Li, Huixiong (2); Lei, Xianliang (2); Feng, Zongrui (2); Hao, Yun (1)
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Corresponding author: Li, Huixiong(huixiong@mail.xjtu.edu.cn)
Source title: Annals of Nuclear Energy
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Article number: 107586
Language: English
ISSN: 03064549
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The effect of dissymmetry heating on flow instability of supercritical water in two parallel vertical upward channels is investigated by a time-domain model. It is found that dissymmetry heating imposes different effects on the system stability under different inlet mass flow or inlet fluid temperature. This is because that mass flow distribution presents different response characteristics to heat load distribution, and critical mass velocity (Gcr) determines this characteristics. When average mass velocity in the channel (G) is below Gcr under low inlet mass flow, the system presents positive response characteristics and system stability increases with dissymmetry heating degree. With the increase of inlet mass flow, positive response characteristics turn to negative response characteristics when G is higher than Gcr. When the system presents negative response characteristics, system stability decreases with dissymmetry heating degree. The stronger the system response characteristics, the more obvious the effect of dissymmetry heating on system stability. © 2020 Elsevier Ltd
Number of references: 34
Main heading: Heating
Controlled terms: Mass transfer - System stability
Uncontrolled terms: Different effects - Fluid temperatures - Heat load distributions - Parallel channel - Response characteristic - Supercritical water - System response - Time domain modeling
Classification code: 641.3 Mass Transfer - 961 Systems Science
DOI: 10.1016/j.anucene.2020.107586
Funding Details: Number: 2015CB251502, Acronym: -, Sponsor: National Basic Research Program of China (973 Program);

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

236. A new vacuum pressure infiltration CFRP method and preparation experimental study of composite (*Open Access*)

Accession number: 20201008264754
Authors: Ma, Yuqin (1); Wang, Jie (1); Zhao, Yatao (1); Wei, Xinliang (2); Ju, Luyan (3); Chen, Yi (1)
Author affiliation: (1) School of Mechano-Electronic Engineering, Xidian University, Xi'an; 710071, China; (2) Army aviation institute, Beijing; 101123, China; (3) Mechanical Engineering College, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Ma, Yuqin(yqma@xidian.edu.cn)
Source title: Polymers
Abbreviated source title: Polym.
Volume: 12
Issue: 2
Issue date: February 1, 2020
Publication year: 2020
Article number: 419
Language: English
E-ISSN: 20734360
Document type: Journal article (JA)
Publisher: MDPI AG
Abstract: In order to prepare a carbon-fiber-reinforced polymer composite (CFRP) with ideal microstructure and properties, a new vacuum pressure infiltration CFRP method is proposed based on an analysis of existing CFRP preparation process methods. Research on composite material preparation systems was carried out by using this new method principle. The system mainly includes a fiber pre-forming module, a vacuum heating infiltration module, a hot-press curing molding module, and a data acquisition control module. Under the conditions of natural curing at 0 MPa + 6 h + 25 °C, vacuum heating curing at -0.05 MPa + 30 min + 80 °C, and hot-press curing at 0.7 MPa + 5 min + 50 °C, a two-dimensional (2D) CFRP with excellent microstructure and properties was successfully prepared. Observing the microstructure of the prepared composite material, it can be found that the inside of the composite material was sufficiently and uniformly infiltrated, and common preparation defects such as holes and delamination were effectively controlled. Through the performance test, the bending strength of the material reached 790 MPa. © 2020 by the authors.
Number of references: 25
Main heading: Hot pressing
Controlled terms: Curing - Presses (machine tools) - Carbon fiber reinforced plastics - Microstructure - Data acquisition - Bending strength
Uncontrolled terms: Experimental system - Material preparation - Microstructure and properties - Performance tests - Preparation method - Preparation process - Two Dimensional (2 D) - Vacuum infiltration
Classification code: 603.1 Machine Tools, General - 723.2 Data Processing and Image Processing - 802.2 Chemical Reactions - 817.1 Polymer Products - 951 Materials Science
Numerical data indexing: Pressure 7.90e+08Pa, Temperature 2.98e+02K, Temperature 3.23e+02K, Temperature 3.53e+02K
DOI: 10.3390/polym12020419
Funding Details: Number: 51905426, Acronym: -, Sponsor: -; Number: 2018JQ5013, Acronym: -, Sponsor: -; Number: 51705389, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017M613062, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 5004#20109195867, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: 2017M613062);(4) National Nature Science Foundation of China (No. 51905426);(5) Fundamental Research Funds for the Central Universities and Innovation Fund of Xidian University (No.500420109195867).Acknowledgments: The authors are grateful for the financial support from the National Natural Science Foundation of China (No. 51705389), the Project Supported by the Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2018JQ5013), the Project funded by the China Postdoctoral Science Foundation (No. 2017M613062), the National Nature Science Foundation of China (No. 51905426), and the Fundamental Research Funds for the Central Universities and Innovation Fund of Xidian University

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Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

237. Fabrication of Ag-Cu2O/PANI nanocomposites for visible-light photocatalysis triggering super antibacterial activity

Accession number: 20201008263674
Authors: Ma, Chengcheng (1); Yang, Zhaoqing (1); Wang, Wei (1); Zhang, Mutian (1); Hao, Xiangping (1); Zhu, Shidong (2); Chen, Shougang (1)
Author affiliation: (1) School of Materials Science and Engineering, Ocean University of China, Qingdao; 266100, China; (2) School of Materials Science and Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Wei
Source title: Journal of Materials Chemistry C
Abbreviated source title: J. Mater. Chem. C
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Issue date: February 28, 2020
Publication year: 2020
Pages: 2888-2898
Language: English
ISSN: 20507534
E-ISSN: 20507526
CODEN: JMCCCX
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: The Ag-Cu2O/PANI composite material was synthesized using a simple, fast, and low-cost process, which is attractive for its many applications in the fields of photocatalysis, surface enhanced Raman scattering (SERS), and characterization. SEM, TEM, XRD, FT-IR, TG, UV-Vis and XPS measurements confirmed the successful synthesis of the Ag-Cu2O/PANI composite material. First-principles calculations on the basis of density functional theory (DFT) were used to analyze regulation of the work function of Cu2O. The results showed that Ag-Cu2O/PANI had an extremely high stability when exposed to oxygen, water, and light for a long period of time, which was attributed to the physical coating of Ag nanoparticles (Ag NPs) transferring the electrons (e-) and holes (h+) inside the Cu2O to the surface through the Schottky barrier to prevent photocorrosion. The deposition of Ag NPs also increased the intensity and time of the oxidative stress reaction of Cu2O, as evidenced by the reactive oxygen species (ROS) test. Ag NPs distributed on the surface of Cu2O particles formed many ion release channels, resulting in an excellent sustained release of Cu2+ ions. PANI as a protective barrier prevented Cu2O from directly contacting the external solution and releasing Cu2+ ions. PANI had an excellent e- transfer ability as a conductive polymer, which improved the efficiency of photogenerated e- and h+ separation of Cu2O. Our results showed that the Ag-Cu2O/PANI exhibited a high long-term antibacterial activity against S. aureus and P. aeruginosa, bacterial inhibition rates of which were maintained around 78% and 80% after being stored in phosphate buffer saline solution for 30 days. In this paper, Ag-Cu2O/PANI is proposed which can enhance the photocatalytic performance of Cu2O and long-term antibacterial activity. This journal is © The Royal Society of Chemistry.
Number of references: 49
Main heading: Oxygen
Controlled terms: Composite materials - Light - Ions - Silver nanoparticles - Copper oxides - Design for testability - Raman scattering - Surface scattering - Calculations - Density functional theory - Schottky barrier diodes - Photocatalysis
Uncontrolled terms: Anti-bacterial activity - Bacterial inhibition - External solutions - First-principles calculation - Phosphate buffer salines - Photocatalytic performance - Surface enhanced Raman Scattering (SERS) - Visible-light photocatalysis
Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics - 761 Nanotechnology - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 921 Mathematics - 922.1 Probability Theory - 931 Classical Physics; Quantum Theory; Relativity - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science

Numerical data indexing: Age 8.22e-02yr, Percentage 7.80e+01%, Percentage 8.00e+01%
DOI: 10.1039/c9tc05891e
Funding Details: Number: 51572249, Acronym: -, Sponsor: -; Number: 2018GSF118039, Acronym: -, Sponsor: -; Number: ZR2017MD016, Acronym: -, Sponsor: Natural Science Foundation of Shandong Province; Number: 19CX05007A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: This work was supported by the National Natural Science Foundation (U1806223, 51572249), the Key Research Project of Shandong Province (2018GSF118039), the Natural Science Foundation for Shandong Province (ZR2014EMM021 and ZR2017MD016), and the Fundamental Research Funds for the Central Universities (201965009, 201964009, 841562011 and 19CX05007A).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

238. Thermodynamic evidence of α–Al heterogeneous nucleation on Al2MgC2 and the interfacial bonding mechanism: A first-principles study

Accession number: 20202108707684
Authors: Li, Jian (1); Cui, Youming (1); Zhang, Ming (2); Zhao, Junyu (1); Luo, Xian (3)
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Corresponding author: Li, Jian(lijian@xsyu.edu.cn)
Source title: Journal of Solid State Chemistry
Abbreviated source title: J. Solid State Chem.
Volume: 288
Issue date: August 2020
Publication year: 2020
Article number: 121431
Language: English
ISSN: 00224596
E-ISSN: 1095726X
CODEN: JSSCBI
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: Al2MgC2 phase is potential as an effective grain refinement of Al-Mg alloys. Moreover, Al2MgC2 also tends to form as interfacial compound in Al-Mg based composites with carbon-containing reinforcements. In order to make an insight into the heterogeneous nucleation of α–Al on Al2MgC2 and the interfacial bonding mechanism, the interface Al(111)/Al2MgC2(0001) has been investigated by using DFT (density functional theory) method in this work. Considering five different terminations of Al2MgC2(0001), and various four stacking sites of Al(111) on Al2MgC2(0001) substrate, totally twenty interface models have been investigated. Interfacial adhesion strength and stability have been examined, Al2MgC2(0001) termination of C over Mg and hollow-site stacking style are identified for the most stable configuration, in which Al(111) is epitaxially connecting with Al2MgC2(0001). So, the heterogeneous nucleation of α–Al on Al2MgC2 substrate is thermodynamically evidenced, and Al(111) is confirmed as dominant orientation of α–Al nucleus on the Al2MgC2(0001) substrate. Interfacial charge transfer (roughly 2.1 e) and formation of Al-C covalent bonds (overlap population 2.50) are demonstrated with electron density difference and Mulliken charge populations. PDOS (partial density of states) and valence orbital composition indicate that interfacial Al-C bonding is mainly contributed from the orbital interactions of Al3p1-C2p2, Al3s23p1-C2p2, Al 3p1-C2s2 and Al3s2-C2s2 at -1.1 eV, -5.3 eV, -9.9 eV and -11.8 eV, respectively. © 2020 Elsevier Inc.
Number of references: 58
Main heading: Aluminum alloys
Controlled terms: Binary alloys - Charge transfer - Magnesium alloys - Grain refinement - Nucleation - Calculations - Chemical bonds - Density functional theory - Aluminum compounds
Uncontrolled terms: Dominant orientation - First-principles study - Heterogeneous nucleation - Interfacial adhesion strength - Interfacial charge transfer - Interfacial compounds - Partial density of state - Stable Configuration
Classification code: 541.2 Aluminum Alloys - 542.2 Magnesium and Alloys - 549.2 Alkaline Earth Metals - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 921 Mathematics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 933.1.2 Crystal Growth
DOI: 10.1016/j.jssc.2020.121431

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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

239. Simultaneous extraction of noble metals and Cs from highly simulated radioactive borosilicate glass using liquid tin metal under reductive heat treatment

Accession number: 20201008251973
Authors: Xu, Zhanglian (1); Zhang, Qian (1); Lv, Ying (2); Wang, Sheng (1); Wang, Jie (1)
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Source title: Materials Chemistry and Physics
Abbreviated source title: Mater Chem Phys
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Article number: 122856
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Simultaneous extraction of metallic Pd, Rh, Ru, Ag, Zn and nonmetallic Cs using liquid tin metal as the collecting metal from the highly simulated borosilicate glass containing high level radioactive waste was examined under reductive and oxidative heat treatment. High Sn recovery efficiency was obtained under reductive atmosphere compared to that under air. The noble metals were concentrated into Sn phase, meanwhile Cs was phase-separated on the contact surface of the glass phase. The highest extraction % of Pd, Ru, Rh, Ag and Zn in Sn aggregation were 94.5, 79.4, 95.6, 84.2, 100 and 54, respectively, from the highly simulated glass after reductive heat treatment. Cs on the glass surface was extracted by leaching with high extraction efficiency up to 80%. Liquid Sn extraction is evidenced to be effective for simultaneously extraction of the noble metals and other nonmetallic fission products from the highly simulated borosilicate glass. © 2020
Number of references: 32
Main heading: Heat treatment
Controlled terms: Liquids - Precious metals - Cesium compounds - Cesium - Efficiency - Fission products - Waste treatment - Borosilicate glass - Zinc - Extraction - Radioactivity
Uncontrolled terms: Contact surface - Extraction efficiencies - Glass phase - Glass surfaces - High level radioactive wastes - Recovery efficiency - Reductive atmospheres - Simultaneous extractions
Classification code: 452.4 Industrial Wastes Treatment and Disposal - 537.1 Heat Treatment Processes - 546.3 Zinc and Alloys - 547.1 Precious Metals - 549.1 Alkali Metals - 622 Radioactive Materials - 622.1 Radioactive Materials, General - 802.3 Chemical Operations - 812.3 Glass - 913.1 Production Engineering
Numerical data indexing: Percentage 8.00e+01%
DOI: 10.1016/j.matchemphys.2020.122856
Funding Details: Number: 2016YFE0128900, Acronym: -, Sponsor: -; Number: 11775166,21906128, 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;
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Xi'an Jiaotong University (No. 7121181102) and the key project of Intergovernmental International Scientific and Technological Innovation Cooperation in China under Grant No.2016YFE0128900.This work was supported by the NSFC (Grant Nos. 21906128 and 11775166), the program of Fundamental Research Funds for the Central Universities (No. 1191329183), Young Talent Support Plan of Xi'an Jiaotong University (No. 7121181102) and the key project of Intergovernmental International Scientific and Technological Innovation Cooperation in China under Grant No. 2016YFE0128900 .
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

240. Synthesis and characterization of novel fluorosilicone triblock copolymers (*Open Access*)

Accession number: 20201808593236
Authors: Cheng, Xitao (1); Tang, Xuan (2); Huang, Fangfang (1)
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Corresponding author: Cheng, Xitao(chengxitao@163.com)
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Issue title: 2020 4th International Conference on Material Science and Technology
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Article number: 012012
Language: English
ISSN: 17578981
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Document type: Conference article (CA)
Conference name: 2020 4th International Conference on Material Science and Technology, ICMST 2020
Conference date: January 22, 2020 - January 23, 2020
Conference location: Wuhan, Hubei, China
Conference code: 158794
Publisher: IOP Publishing Ltd
Abstract: Novel fluorosilicone triblock copolymers poly (2,2,3,4,4,4-hexafluorobutyl methacrylate)-block-poly(dimethylsiloxane)-block-poly (2,2,3,4,4,4-hexafluorobutyl methacrylate) (PHFBMA-b-PDMS-b-PHFBMA) were synthesized by atom transfer radical polymerization (ATRP). The optimum reaction conditions were also studied in the work. The structure and composition of the copolymers were analyzed and identified by infrared spectroscopy (IR), nuclear magnetic resonance (NMR), gel permeation chromatography (GPC), differential scanning calorimetry (DSC). The effects of the fluorine and silicone content on the hydrophobic and oleophobic properties of prepared triblock copolymers were also investigated. The results showed that the prepared triblock copolymers had excellent hydrophobic and oleophobic properties. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 12
Main heading: Block copolymers
Controlled terms: Atom transfer radical polymerization - Fluorine containing polymers - Nuclear magnetic resonance spectroscopy - Differential scanning calorimetry - Fluorine - Gel permeation chromatography - Hydrophobicity - Silicones - Infrared spectroscopy - Nuclear magnetic resonance
Uncontrolled terms: Fluorosilicones - Gel permeation chromatography (GPC) - Nuclear magnetic resonance(NMR) - Oleophobic - Optimum reaction conditions - PDMS-b-PHFBMA - Silicone content - Synthesis and characterizations
Classification code: 802.3 Chemical Operations - 804 Chemical Products Generally - 815.1 Polymeric Materials - 815.1.1 Organic Polymers - 815.2 Polymerization - 931.2 Physical Properties of Gases, Liquids and Solids - 944.6 Temperature Measurements
DOI: 10.1088/1757-899X/774/1/012012
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex

Data Provider: Engineering Village

241. Long chain defective metal string complex with modulated oligo-α–pyridylamino ligand: Synthesis, crystal structure and properties

Accession number: 20193807447151
Authors: Ismayilov, Rayyat Huseyn (1); Valiyev, Fuad Famil (1); Israfilov, Nizami Vali (1); Wang, Wen-Zhen (2); Lee, Gene-Hsiang (3); Peng, Shie-Ming (3); Suleimanov, Baghir A. (1)
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Corresponding author: Suleimanov, Baghir A.(Baghir.Suleymanov@socar.az)
Source title: Journal of Molecular Structure
Abbreviated source title: J. Mol. Struct.
Volume: 1200
Issue date: 15 January 2020
Publication year: 2020
Article number: 126998
Language: English
ISSN: 00222860
CODEN: JMOSB4
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Through a pyrimidine and naphthyridine-containing triamine ligand, N2-(pyrimidin-2-yl)-N7-(2-(pyrimidin-2-ylamino)-1,8-naphthyridin-7-yl)-1,8-naphthyridine-2,7-diamine (H3N9-2pm), defective metal string complex [Ni8.33(N9-2pm)4(NCS)2](PF6)2 (1) was successfully synthesized and structurally characterized. The complex consists of a linear metal chain and four deprotonated supporting ligands which are helically wrapped around the metal score. X-Ray crystallographic studies revealed that the complex (1) crystallizes in space group P21/c of the monoclinic system. The small J value (J = -2.90 cm-1) suggests quite a weak magnetic interaction throughout the molecule of complex (1). The weak magnetic interaction in the defective complex indicates that the spin exchange in metal string occurs through the metal core rather than the bridging ligands. The electrochemical study on complex 1 shows abundant redox properties and facility to the reduction in its cyclic voltammogram by displaying three reversible redox couples at E1/2 = - 0.35, - 0.69 and – 0.88 V. © 2019 Elsevier B.V.
Number of references: 19
Main heading: Ligands
Controlled terms: X ray crystallography - Synthesis (chemical) - Magnetic properties - Metals - Crystal structure - Chelation - Defects - Nickel compounds - Magnetism
Uncontrolled terms: Crystallographic studies - Electrochemical studies - Metal interactions - Naphthyridine - Nickel complex - Resonance analysis - Reversible redox couples - Structure and properties
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 933.1.1 Crystal Lattice - 951 Materials Science
Numerical data indexing: Voltage 8.80e-01V
DOI: 10.1016/j.molstruc.2019.126998
Funding Details: Number: -, Acronym: NSC, Sponsor: National Science Council;
Funding text: We thank the National Science Council and the Ministsry of Education of the Republic of China for financial support. We are also grateful to Mr. Wang Shih-Chi for his help with magnetic measurement and Mr. Huang Yi-Lin for his electrochemistry measurement.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

242. Anisotropic plasticity of nanocrystalline Ti: A molecular dynamics simulation

Accession number: 20202208741300
Authors: An, Minrong (1); Su, Mengjia (2); Deng, Qiong (2); Song, Haiyang (1); Wang, Chen (1); Shang, Yu (1)
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Publication year: 2020
Article number: 046201
Language: English
ISSN: 16741056
E-ISSN: 20583834
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: Using molecular dynamics simulations, the plastic deformation behavior of nanocrytalline Ti has been investigated under tension and compression normal to the {0001}, {1010}, and 1210 planes. The results indicate that the plastic deformation strongly depends on crystal orientation and loading directions. Under tension normal to basal plane, the deformation mechanism is mainly the grain reorientation and the subsequent deformation twinning. Under compression, the transformation of hexagonal-close packed (HCP)-Ti to face-centered cubic (FCC)-Ti dominates the deformation. When loading is normal to the prismatic planes (both {1010} and {1210}), the deformation mechanism is primarily the phase transformation among HCP, body-centered cubic (BCC), and FCC structures, regardless of loading mode. The orientation relations (OR) of {0001}HCP||{111}FCC and .1210.HCP||.110.FCC, and {1010}HCP||{110}FCC and .0001.HCP||.010.FCC between the HCP and FCC phases have been observed in the present work. For the transformation of HCP.BCC.HCP, the OR is {0001}a1||{110}b ||{1010}a2 (HCP phase before the critical strain is defined as a1-Ti, BCC phase is defined as b-Ti, and the HCP phase after the critical strain is defined as a2-Ti). Energy evolution during the various loading processes further shows the plastic anisotropy of nanocrystalline Ti is determined by the stacking order of the atoms. The results in the present work will promote the in-depth study of the plastic deformation mechanism of HCP materials. © 2020 Chinese Physical Society and IOP Publishing Ltd.
Number of references: 44
Main heading: Molecular dynamics
Controlled terms: Nanocrystals - Plastic deformation - Anisotropy - Crystal orientation - Nanocrystalline materials
Uncontrolled terms: Anisotropic plasticity - Deformation mechanism - Hexagonal close packed - Molecular dynamics simulations - Orientation relations - Plastic deformation behavior - Plastic deformation mechanisms - Tension and compression
Classification code: 761 Nanotechnology - 801.4 Physical Chemistry - 931.2 Physical Properties of Gases, Liquids and Solids - 933.1 Crystalline Solids - 933.1.1 Crystal Lattice
DOI: 10.1088/1674-1056/ab7188
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

243. Multi-Order Resonance and High-Efficiency Sound Absorption Mechanism of Low-Frequency Large-Band Acoustic Metamaterials

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Title of translation:
Authors: Liu, Botao (1, 2); Liu, Chongrui (2); Wu, Jiuhui (2); Zhang, Qizhi (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) State Key Laboratory for Strength and Vibration of Mechanical Structures, Xi'an Jiaotong University, Xi'an; 710049, China
Corresponding author: Wu, Jiuhui
Source title: Hsi-An Chiao Tung Ta Hsueh/Journal of Xi'an Jiaotong University
Abbreviated source title: Hsi An Chiao Tung Ta Hsueh
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Publication year: 2020
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Language: Chinese
ISSN: 0253987X
CODEN: HCTPDW
Document type: Journal article (JA)

Publisher: Xi'an Jiaotong University
Abstract: Aiming at the shortcomings of low efficiency and narrow frequency band of traditional sound-absorbing materials, a multi-order resonance metasurface is designed. The multi-level resonant metasurface is constructed by inserting one or more partition plates with small holes inside the resonant cavity, so that while maintaining the original sound absorption peak and the same structure size, it can obtain multiple nearly perfect sound absorption peak to obviously widen the sound absorption bandwidth. The efficient absorption characteristics of the maze second-order resonance metasurface are analyzed by the sound absorption coefficient and the relative acoustic impedance ratio, and the effect of the aperture change on the sound absorption characteristics of the second-order resonance metasurface is investigated. The equivalent acoustic impedance of the first-order resonance metasurface, and the second-order resonance metasurface is equivalent to a two-degree-of-freedom mass spring system, and the in-depth analysis of the multi-order resonance sound absorption mechanism is performed via the system natural frequency and natural mode components. Taking thermal air viscosity in Helmholtz resonant cavity into account, the theory of equivalent density and compressibility is introduced during deducing the theoretical calculation of the multi-order resonance metasurface. Following accurate balancing the coupling parameters of multiple elements, a low-frequency broadband sub-wavelength super-surface absorber is designed, which is composed of nine units and has a thickness of 8 cm. This absorber is endowed with continuous and excellent sound absorption characteristics within the frequency band of 310-1 560 Hz, an average sound absorption coefficient reaches higher than 90%. This research provides a new idea for the realization of low-frequency large-bandwidth absorption, and has potential application prospects in engineering noise reduction.
Number of references: 22
Main heading: Resonance
Controlled terms: Acoustic impedance - Sound insulating materials - Cavity resonators - Acoustic wave absorption - Degrees of freedom (mechanics) - Noise abatement - Bandwidth - Balancing
Uncontrolled terms: Absorption characteristics - Acoustic metamaterials - Engineering noise reduction - Narrow frequency band - Sound absorbing materials - Sound absorption characteristic - Sound absorption coefficients - Theoretical calculations
Classification code: 413.3 Sound Insulating Materials - 601 Mechanical Design - 716.1 Information Theory and Signal Processing - 751.1 Acoustic Waves - 751.2 Acoustic Properties of Materials - 751.4 Acoustic Noise - 931.1 Mechanics
Numerical data indexing: Frequency 3.10e+02Hz to 1.56e+03Hz, Percentage 9.00e+01%, Size 8.00e-02m
DOI: 10.7652/xjtuxb202008019
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

244. Influence of Pressure on Spontaneous Imbibition in Tight Sandstone Reservoirs

Accession number: 20204009299152
Authors: Wang, Chen (1, 2, 3); Gao, Hui (1, 3); Gao, Yuan (1, 4); Fan, Haiming (5)
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Corresponding author: Gao, Yuan(gaoyxsyu@163.com)
Source title: Energy and Fuels
Abbreviated source title: Energy Fuels
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Pages: 9275-9282
Language: English
ISSN: 08870624
E-ISSN: 15205029
CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Reservoir pressure is a key factor affecting the degree of spontaneous imbibition. In this work, the oil distribution characteristics in core samples were simulated before and after spontaneous imbibition using nuclear magnetic resonance (NMR) technology. Specifically, four core samples were selected and subjected to spontaneous

imbibition experiments at 0.1, 5, 10, and 15 MPa, respectively. Furthermore, the imbibition efficiency and imbibition rate at different pressures can be quantitatively calculated using the NMR T2 spectrum. The results indicate that the imbibition efficiency of smaller and larger pores has no obvious trend in the initial stage of spontaneous imbibition (0-72 h). After 72 h of spontaneous imbibition, there was a significant positive correlation between the imbibition efficiency and experimental pressure. Moreover, the imbibition rate of smaller pores increased monotonically with the increase in experimental pressure at 72-216 h in the four core samples. The imbibition rate of the smaller pores in core sample #4 at an experimental pressure of 15 MPa reached a maximum of 0.245%/h. However, the imbibition rate of larger pores in the four core samples has no significant correlation with pressure. In the overall analysis, the imbibition efficiency and imbibition rate of the four core samples have a positive correlation with the experimental pressure. At the same time, it was found that because of the greater number of smaller pores in tight sandstone, the degree of influence of experimental pressure on the spontaneous imbibition effect in smaller pores determines its influence on the overall spontaneous imbibition in the tight sandstone reservoir. Copyright © 2020 American Chemical Society.
Number of references: 31
Main heading: Efficiency
Controlled terms: Nuclear magnetic resonance - Sandstone - Core samples - Tight gas
Uncontrolled terms: Different pressures - Imbibition efficiencies - Nuclear magnetic resonance(NMR) - Oil distributions - Positive correlations - Reservoir pressures - Spontaneous imbibition - Tight sandstone reservoirs
Classification code: 482.2 Minerals - 512.2 Natural Gas Deposits - 522 Gas Fuels - 913.1 Production Engineering
Numerical data indexing: Pressure 1.50e+07Pa, Time 0.00e+00s to 2.59e+05s, Time 2.59e+05s, Time 2.59e+05s to 7.78e+05s
DOI: 10.1021/acs.energyfuels.0c00639
Funding Details: Number: 2019JQ-808, Acronym: -, Sponsor: -; Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2019JQ-403, Acronym: -, Sponsor: -; Number: 19CX05006A, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: We acknowledge the financial support by the Open Fund (PLC20190804) of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology), the Natural Science Basic Research Program of Shaanxi (Grant No. 2019JQ-808), the Youth Innovation Team of Shaanxi Universities, the Natural Science Basic Research Program of Shaanxi (Grant No. 2019JQ-403), and the Opening Fund of Shandong Key Laboratory of Oilfield Chemistry and the Fundamental Research Funds for the Central Universities (19CX05006A).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

245. Direct synthesis of C2-oxygenates from CH4 and CO2 over acid-modified CoPd/TiO2 catalyst

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Title of translation: CoPd/TiO2CH4-CO2C2
Authors: Li, Zhiqin (1); Li, Qiao (1); Huang, Wei (2); Ding, Liang (1); Qiu, Zegang (1)
Author affiliation: (1) College of Chemistry and chemical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Institute of Coal Chemical Engineering, Taiyuan University of Technology, Taiyuan; Shanxi; 030024, China
Corresponding author: Qiu, Zegang(qiuzegang@xsyu.edu.cn)
Source title: Huagong Jinzhan/Chemical Industry and Engineering Progress
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Issue date: March 5, 2020
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Pages: 1035-1042
Language: Chinese
ISSN: 10006613
Document type: Journal article (JA)
Publisher: Materials China
Abstract: CoPd/TiO2 catalysts modified by acids were used to catalyze the step-wise reaction of CH4 and CO2 to directly synthesize C2-oxygenates(acetic acid and ethanol) under mildness conditions. The effect of the different introducing manners of acid and treatment of different acids on the activity and selectivity of catalysts was investigated at temperature between 150 and 300. All Catalysts were characterized by XRD, TPD, XPS, NH3-TPD and N2

adsorption. The formation rate and selectivity of C2-oxygenates was markedly improved by acid modification. The performance and structure of catalysts were obviously affected by introducing manner of acid. High activity was observed on the catalyst which was prepared by first treating the TiO2 support with acids then immobilizing Co and Pd. In the case of the treatment of H3PO4, HNO3 and HCl, the best activity was attained on the catalyst modified by H3PO4. The highest formation rate of C2-oxygenates (acetic acid and ethanol) reached 3365μg/(g•h), while the highest selectivity of C2-oxygenates was 91% at 150.
Number of references: 14
Main heading: Titanium dioxide
Controlled terms: Acetic acid - Ammonia - Carbon dioxide - Catalyst activity - Catalyst selectivity - Chlorine compounds - Ethanol - Palladium compounds - pH
Uncontrolled terms: C2-oxygenate - Catalyse - CH 4 - Co-pd/TiO2 catalyst - Condition - Direct synthesis - Formation rates - N 2 adsorption - XRD -]+ catalyst
Classification code: 801.1 Chemistry, General - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 9.10E+01%
DOI: 10.16085/j.issn.1000-6613.2019-1047
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

246. Geomechanical simulation of low-order fracture of tight sandstone

Accession number: 20201508388409
Authors: Yin, Shuai (1, 2, 3); Wu, Zhonghu (4)
Author affiliation: (1) School of Earth Science 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; Sichuan; 610059, China; (3) Shanxi Key Laboratory of Petroleum Accumulation Geology, School of Earth Science and Engineering, Xi'an Shiyou University, Xi'an; Shanxi; 710065, China; (4) College of Civil Engineering, Guizhou University, Guiyang; 550025, China
Corresponding author: Yin, Shuai(speedysys@163.com)
Source title: Marine and Petroleum Geology
Abbreviated source title: Mar. Pet. Geol.
Volume: 117
Issue date: July 2020
Publication year: 2020
Article number: 104359
Language: English
ISSN: 02648172
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The core factors in the study of fractures within tight sandstone reservoirs are tectonics, geomechanics and fluid mobility, which are not independent but are coupled to each other. In this paper, taking the upper Paleozoic gas reservoir within the low-amplitude tectonic zone in the Sulige gas field of the Ordos Basin as an example, the developmental characteristics and geomechanical model of fractures and their relationships with the productivity of tight gas sandstone reservoirs were systematically studied. The results show that this low-amplitude structural zone develops mainly low-order ruptures. The paleotectonic stress field of the target layer in the Yanshanian period was restored using a 3D finite element method. The horizontal principal stresses exhibited stress diffusion and were affected by local low-amplitude structures. There was a positive correlation between #H and #h, and #H/#h was distributed primarily between 1.35 and 1.95 with an average of 1.62. The strain energy density (U) was calculated to quantitatively characterize the microfracture distribution of the target layer based on the principle of energy conservation. There are certain positive correlations between U and the horizontal principal stresses. The geostresses of high-U regions underwent a certain degree of stress torsion, which manifested as a stress deflection reaching up to 30° during stress propagation. Finally, we proposed the concept of U-value geomechanical sweet spots in a tight gas sandstone. Based on this criterion, commercial gas wells can be effectively identified.
Number of references: 66
Main heading: Tectonics
Controlled terms: Gases - Tight gas - Gas industry - Metamorphic rocks - Natural fractures - Petroleum reservoirs - Strain energy - Geomechanics - Natural gas fields - Sandstone
Uncontrolled terms: Geomechanical simulations - Low order - Low-amplitude - Ordos Basin - Tight gas sandstones

Classification code: 421 Strength of Building Materials; Mechanical Properties - 481 Geology and Geophysics - 481.1 Geology - 482.2 Minerals - 512.1.1 Oil Fields - 512.2 Natural Gas Deposits - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 931.1 Mechanics
DOI: 10.1016/j.marpetgeo.2020.104359
Funding Details: Number: -, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

247. Effect of Material Characteristics of High Damping Rubber Bearings on Aseismic Behaviors of a Two-Span Simply Supported Beam Bridge (*Open Access*)

Accession number: 20204209364449
Authors: Zhang, Yumin (1, 2); Li, Jiawu (2)
Author affiliation: (1) Department of Civil Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Highway Bridge and Tunnel, Highway College of Chang'an University, Xi'an; 710064, China
Corresponding author: Li, Jiawu(ljw@gl.chd.edu.cn)
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Abbreviated source title: Adv. Mater. Sci. Eng.
Volume: 2020
Issue date: 2020
Publication year: 2020
Article number: 9231382
Language: English
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E-ISSN: 16878442
Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: There are a large number of damping materials in high-damping rubber (HDR) bearings, so the HDR bearings have the characteristics of both common rubber bearings and damping measures and show good aseismic effect. In this paper, the time-history dynamic analysis method is used to study the seismic effects of HDR bearings on the aseismic behaviors of two-span simply supported beam bridge under Northridge earthquake by changing the damping characteristics of the bearings. It is found that, with increasing damping of the bearings, both the horizontal shear and the displacement of the HDR bearings decrease, and the seismic energy dissipates through both the yield deformation and damping of the bearings. Although the girder and bearings have smaller displacement, when the HDR bearings with larger damping, the seismic responses, including displacement of pier top, shear force of pier bottom, and bending moment of pier bottom, are hardly affected by the change of the damping of the bearings. The HDR bearings with higher damping and yield characteristics separate and dissipate the seismic energy transmitted to the superstructure of the bridge and have better seismic effect on the structure in an earthquake. © 2020 Yumin Zhang and Jiawu Li.
Number of references: 37
Main heading: Damping
Controlled terms: Nonmetallic bearings - Rubber - Earthquakes - Bearings (structural) - Piers
Uncontrolled terms: Damping characteristics - High damping rubber bearings - High damping rubbers - Material characteristics - Northridge earthquakes - Simply supported beams - Time-history dynamic analysis - Yield characteristics
Classification code: 401.1 Bridges - 407.1 Maritime Structures - 408.2 Structural Members and Shapes - 484 Seismology - 601.2 Machine Components - 818.1 Natural Rubber - 931.1 Mechanics
DOI: 10.1155/2020/9231382
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Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
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248. Nanopore structure characteristics of high-rank vitrinite- and inertinite-coal

Accession number: 20203909246593
Title of translation:
Authors: Shan, Chang'an (1, 2, 3); Zhang, Tingshan (4); Liang, Xing (5); Hu, Ranran (5); Zhao, Weiwei (1)
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Corresponding author: Shan, Chang'an(shanca@xsyu.edu.cn)
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Abstract: Sixteen high-rank coal samples with the vitrinite content greater than 75% and seven high-rank coal samples with the inertinite content greater than 75% were selected from coalbed methane wells in the Junlian area in the southern Sichuan Basin. Using scanning electron microscopy, in combination with low temperature nitrogen adsorption experiment and physical property test analysis based on nuclear magnetic resonance, this paper systematically, qualitatively and quantitatively compare and study the nanopore structure characteristics of high-rank vitrinite- and inertinite-rich coal. The results show that primary pores (vegetable tissue pores) are more developed in the inertinite than in the vitrinite, while epigenetic pores (stomata) and exogenous pores (breccia pores and fracture pores) are more developed in the vitrinite. Both the high-rank vitrinite- and inertinite-rich coal has a complex nano-scale pore structure, but the pore morpholohy of high-rank inertinite-rich coal is more complex and special (the ink bottle-shaped pores are more developed). There are significant differences in the forms of the adsorption curves of high-rank vitrinite- and inertinite-rich coal at the initial stage (p/p00 © 2020, Editorial Office of ACTA PETROLEI SINICA. All right reserved.
Number of references: 45
Main heading: Pore structure
Controlled terms: Methane - Nanopores - Scanning electron microscopy - Temperature - Nitrogen - Pore size - Specific surface area - Bottles - Coal deposits - Coal - Coal bed methane - Gas adsorption
Uncontrolled terms: Adsorption curves - Coal bed methane wells - Irreducible water saturation - Low-temperature nitrogen - Negative correlation - Nitrogen adsorption - Pores and fractures - Structure characteristic
Classification code: 503 Mines and Mining, Coal - 512.2 Natural Gas Deposits - 522 Gas Fuels - 524 Solid Fuels - 641.1 Thermodynamics - 694.2 Packaging Materials - 761 Nanotechnology - 802.3 Chemical Operations - 804 Chemical Products Generally - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 933 Solid State Physics - 951 Materials Science
Numerical data indexing: Percentage 7.50e+01%, Size 1.00e-08m, Size 2.00e-09m to 1.00e-08m, Size 2.00e-09m, Size 2.00e-09m to 4.00e-09m, Size 4.00e-09m, Size 6.40e-10m
DOI: 10.7623/syxb202006007
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

249. Optimization of fin configurations and layouts in a printed circuit heat exchanger for supercritical liquefied natural gas near the pseudo-critical temperature

Accession number: 20201208310077
Authors: Tang, Linghong (1, 2); Cui, Lu (1); Sundén, Bengt (2)

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Source title: Applied Thermal Engineering
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Article number: 115131
Language: English
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Publisher: Elsevier Ltd
Abstract: In this study, the effects of fin configurations and layouts on thermal and hydraulic performances of printed circuit heat exchangers (PCHEs) with supercritical liquefied natural gas as the working fluid are studied by a numerical method, and the overall heat transfer performance of various parameters is evaluated by the JF factor. Firstly, the effect of four different airfoil configurations, i.e., NACA 0015, NACA 0018, NACA 0021, and NACA 0024, on thermal and hydraulic performances is investigated. The comparative results indicate that NACA 0024 offers the best overall heat transfer performance. Furthermore, the effect of the vortex generator (VG) minimum transverse distance on thermal and hydraulic performances is analyzed in detail. The results show that, for a given VG configuration, the VG minimum transverse distance should not be too small or too large, so that the longitudinal vortices (LVs) generated will not interact with each other and the LVs' influences may reach a longer distance. The optimal VG minimum transverse distance is 2.0Wa. Finally, the nonuniform segmented heat transfer enhancement mechanism of PCHEs with VG and airfoil fins near the pseudo-critical temperature is explained. The results indicate that the upstream-denser VG and airfoil fins are good choices for improving the overall heat transfer performance, and an optimal VG and airfoil fin arrangement is suggested. © 2020 Elsevier Ltd
Number of references: 32
Main heading: Liquefied natural gas
Controlled terms: Vortex flow - Vorticity - Printed circuits - Temperature - Fins (heat exchange) - Numerical methods - Timing circuits
Uncontrolled terms: Airfoil configuration - Heat transfer enhancement mechanism - Longitudinal vortices - Overall heat transfer performance - Printed circuit heat exchangers - Pseudo-critical temperature - Thermal and hydraulic performance - Vortex generators
Classification code: 523 Liquid Fuels - 616.1 Heat Exchange Equipment and Components - 631.1 Fluid Flow, General - 641.1 Thermodynamics - 713.4 Pulse Circuits - 921.6 Numerical Methods
DOI: 10.1016/j.applthermaleng.2020.115131
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Compendex references: YES
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250. Secure Multiusers Directional Modulation Scheme Based on Random Frequency Diverse Arrays in Broadcasting Systems (*Open Access*)

Accession number: 20203609144345
Authors: Gao, Jianbang (1, 2); Yuan, Zhaohui (1); Qiu, Bin (3); Zhou, Jing (2)
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Corresponding author: Gao, Jianbang(gjbang2008@126.com)
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Language: English
ISSN: 19390114
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Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: In this paper, we research a synthesis scheme for secure wireless communication in the broadcasting multiusers directional modulation system, which consists of multiple legitimate users (LUs) receiving the same confidential messages and multiple eavesdroppers (Eves) intercepting the confidential messages. We propose a new type of array antennas, termed random frequency diverse arrays (RFDA), to enhance the security of confidential messages due to its angle-range dependent beam patterns. Based on RFDA, we put forward a synthesis scheme to achieve multiobjective secure wireless communication. First, with known locations of Eves, the beamforming vector is designed to minimize Eves' receiving power of confidential message (Min-ERP) while satisfying the power requirement of LUs. Furthermore, we research a more practical scenario, where locations of Eves are unknown. Unlike the scenario of known locations of Eves, the beamforming vector is designed to maximize the sum received power of LUs (Max-LRP) while satisfying a minimum received power constraint at each LU. Second, the artificial-noise projection matrix (ANPM) is calculated to reduce artificial-noise (AN) impact on LUs and enhance the interference on Eves. Numerical results verify the superior secure performance of the proposed schemes in the broadcasting multiusers system. © 2020 Jianbang Gao et al.
Number of references: 30
Main heading: Beamforming
Controlled terms: Directional patterns (antenna) - Location - Beam forming networks - Broadcasting - Modulation
Uncontrolled terms: Broadcasting systems - Confidential message - Modulation schemes - Modulation systems - Numerical results - Power requirement - Projection matrix - Secure wireless communication
Classification code: 711.2 Electromagnetic Waves in Relation to Various Structures - 716 Telecommunication; Radar, Radio and Television
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Funding text: This work was supported by the National Natural Science Foundation of China (Grant no. 51874238) and the Innovation Foundation for Doctor Dissertation of Northwestern Polytechnical University (Grant no. CX202038).
Compendex references: YES
Open Access type(s): All Open Access, Gold
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251. The genesis model of carbonate cementation in the tight oil reservoir: A case of Chang 6 oil layers of the Upper Triassic Yanchang Formation in the western Jiyuan area, Ordos Basin, China (*Open Access*)

Accession number: 20204609488993
Authors: Li, Shutong (1); Li, Shixiang (2); Zhou, Xinping (2); Ma, Xiaofeng (1); Guo, Ruiliang (3, 4, 5); Zhang, Jiaqiang (1, 5); Chen, Junlin (1, 5)
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Source title: Open Geosciences
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Issue date: January 1, 2020
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Pages: 1105-1115
Language: English
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Document type: Journal article (JA)
Publisher: De Gruyter Open Ltd

Abstract: Carbonate cementation is one of the significant tightness factors in Chang 6 reservoir of the western Jiyuan (WJY) area. Based on the observation of core and thin sections, connecting-well profile analysis as well as carbon and oxygen isotope analysis, it is found that ferrocalcite is the main carbonate cements in the Chang 6 reservoir of the WJY area. The single sand body controls the development of carbonate cements macroscopically. Both carbonate cements and calcite veins hold similar diagenetic conditions: The dissolution of plagioclase is the main calcium source and the de-acidification of organic acids is the main carbon source. The diagenetic stage is identified as the mesogenetic A stage. The sedimentary environment is of low salinity. Accordingly, the development model of carbonate cementation in Chang 6 reservoir is summarized into three types: "eggshell pattern,""cutting pattern,"and "favorable reservoir pattern."The development degree of carbonate cementation affects the physical properties of reservoir. © 2020 Shutong Li et al., published by De Gruyter 2020.
Number of references: 32
Main heading: Carbon
Controlled terms: Cementing (shafts) - Carbonation - Metamorphic rocks - Feldspar - Petroleum reservoir engineering - Calcite - Petroleum reservoirs
Uncontrolled terms: Carbon and oxygen isotopes - Carbonate cementation - Development degree - Development model - Ordos basin , China - Sedimentary environment - Single sand bodies - Yanchang Formation
Classification code: 482.2 Minerals - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds
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Funding Details: Number: 41772142,41802160, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

252. Evaluation and field test of corrosion inhibitors of oil tube carbon steel from Shaanbei Oilfield

Accession number: 20201108281479
Authors: Xie, Juan (1, 2, 3); Jia, Xiaowei (1); Huang, Hangjuan (4); Jia, Xiao (4); Huang, Guangda (4); Gao, Ningsheng (4); Ma, Yun (2)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Shaanxi Province Key Laboratory of Environmental Pollution Control and Reservoir Protection Technology of Oilfields, Xi'an Shiyou University, Xi’an, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing, China; (4) The 6th Gas Production Plant of Changqing Oilfield Company, Xi’an; Shaanxi; 710003, China
Source title: Materials Science Forum
Abbreviated source title: Mater. Sci. Forum
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Part number: 1 of 1
Issue title: Metal Materials Processes and Manufacturing
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CODEN: MSFOEP
ISBN-13: 9783035716320
Document type: Conference article (CA)
Conference name: 2nd International Conference on Metal Material Processes and Manufacturing, ICMMPM 2019
Conference date: July 30, 2019 - July 31, 2019
Conference location: Jeju, Korea, Republic of
Conference code: 237699
Publisher: Trans Tech Publications Ltd

Abstract: This paper deals with the investigation of the corrosion situation of oil wells on site. On the basis of water quality analysis, the corrosion status of the site was studied on J55 steel used in the field. The most severe water sample was selected as the medium for electrochemical evaluation and on-site. The screening of four corrosion inhibitors was conducted in our study. Results showed that the salinity of the produced water is relatively high (average value of 29,819 mg/L), the chloride ion content is high (average value of 17762.8 mg/L), and the corrosion rate is up to 0.1345 mm/a. Scanning electron microscopy (SEM) was used to analyze the corrosion products and morphology of the studied samples. In the electrochemical evaluation test, the TS-001 corrosion inhibitor has a good corrosion inhibition rate, which can reach up to 97.75% when the dosage is 100 mg/L. © 2020 Trans Tech Publications Ltd, Switzerland.
Number of references: 9
Main heading: Corrosion inhibitors
Controlled terms: Water quality - Chlorine compounds - Oil fields - Corrosion rate - Quality control - Scanning electron microscopy - Steel corrosion
Uncontrolled terms: Average values - Chloride ions - Corrosion inhibition - Corrosion products - Electrochemical evaluations - Field test - Inhibitor - Water quality analysis
Classification code: 445.2 Water Analysis - 512.1.1 Oil Fields - 539.1 Metals Corrosion - 539.2.1 Protection Methods - 545.3 Steel - 803 Chemical Agents and Basic Industrial Chemicals - 913.3 Quality Assurance and Control
Numerical data indexing: Mass_Density 1.00e-01kg/m3, Mass_Density 1.78e+01kg/m3, Mass_Density 2.98e+01kg/m3, Percentage 9.78e+01%
DOI: 10.4028/www.scientific.net/MSF.977.115
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Compendex references: YES
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Data Provider: Engineering Village

253. Numerical investigation of different heat transfer behaviors of supercritical CO2 in a large vertical tube

Accession number: 20194807737799
Authors: Zhang, Qian (1); Li, Huixiong (1); Liu, Jialun (2); Lei, Xianliang (1); Wu, Chao (1)
Author affiliation: (1) State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an; Shaanxi; 710049, China; (2) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Li, Huixiong(huixiong@mail.xjtu.edu.cn)
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Abbreviated source title: Int. J. Heat Mass Transf.
Volume: 147
Issue date: February 2020
Publication year: 2020
Article number: 118944
Language: English
ISSN: 00179310
CODEN: IJHMAK
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The design and optimization of key heat exchange components in supercritical CO2 (sCO2) Brayton-cycle need a thorough understanding to heat transfer of sCO2. As a continuation of our experiments, numerical studies are performed to explore the mechanisms behind different heat transfer behaviors of sCO2 occurred at different mass fluxes. Seven turbulence models are assessed against the test data, and the v2f model and SST k-$_{\omega}$ model are recommended for low and normal mass flux cases, respectively. A novel analysis approach is proposed by treating heat transfer of SCFs as a coupling of heat conduction of boundary layer, pseudo-phase-change heat transfer of large specific heat (cp) fluid and convective heat transfer of turbulence core. For low mass flux cases, the special heat transfer enhancement (HTE) in low fluid enthalpy (hb) region is mainly caused by strong buoyancy effect, which thins the thickness of viscous sub-layer and promotes turbulent kinetic energy (k). But for normal mass flux case, heat transfer deterioration (HTD) occurs due to decreasing fluid thermal conductivity $_{(\lambda)}$ of viscous sub-layer and suppressing turbulence via buoyancy. The buffer layer plays a bridge for heat transfer from viscous sub-layer to external turbulence region. Meanwhile, a noteworthy phenomenon is that, the heat conduction process of boundary

layer shows a strong relevance with the evolution of heat transfer behaviors, and has a great effect on overall heat transfer of sCO2, but this is seldom concerned in former research. © 2019 Elsevier Ltd
Number of references: 48
Main heading: Carbon dioxide
Controlled terms: Deterioration - Heat transfer coefficients - Kinetics - Buoyancy - Specific heat - Atmospheric thermodynamics - Boundary layers - Heat transfer performance - Brayton cycle - Heat conduction - Heat convection - Kinetic energy - Turbulence models - Supercritical fluid extraction
Uncontrolled terms: Buoyance effect - Heat transfer deterioration - Heat Transfer enhancement - Low mass fluxes - Supercritical carbon dioxides
Classification code: 443.1 Atmospheric Properties - 631.1 Fluid Flow, General - 641.1 Thermodynamics - 641.2 Heat Transfer - 802.3 Chemical Operations - 804.2 Inorganic Compounds - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.ijheatmasstransfer.2019.118944
Funding Details: Number: 51506170, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2015CB251502, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: This study was supported by the National Basic Research Program of China (973 Program, Grant No. 2015CB251502) and the National Natural Science Foundation for Young Scientists of China (Grant No. 51506170).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

254. Artificial-Noise-Aided Energy-Efficient Secure Multibeam Wireless Communication Schemes Based on Frequency Diverse Array (*Open Access*)

Accession number: 20202908952229
Authors: Gao, Jianbang (1, 2); Yuan, Zhaohui (1); Zhou, Jing (2); Qiu, Bin (3)
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Corresponding authors: Gao, Jianbang(gjbang2008@126.com); Gao, Jianbang(gjbang2008@126.com)
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Article number: 4715929
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ISSN: 15308669
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Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: In this paper, we research synthesis scheme for secure wireless communication in multibeam directional modulation (MBDM) system, which consists of multiple legitimate users (LUs) receiving their own individual confidential messages, respectively, and multiple eavesdroppers (Eves) intercepting confidential messages. We propose a new type of array antennas, termed frequency diverse arrays (FDA), to enhance security of confidential messages. Leveraging FDA technology and artificial noise (AN) technology, we aim to address the PHY security problem for MBDM by jointly optimizing the frequency offsets, the precoding matrix and the AN projection matrix. In the first stage, with known locations of Eves, precoding matrix is designed to minimize Eve's receiving power of confidential message (Min-ERP), while satisfying power requirement of LUs. And then artificial-noise projection matrix (ANPM) is calculated to enhance AN impact on Eves without influencing LUs. Furthermore, we research a more practical scenario, where locations of Eves are unknown. Unlike the scenario of the known locations of Eves, precoding matrix is designed to maximize AN transmit power (Max-ATP), while satisfying each LU's requirement received power of confidential message. In the second stage, we analyze and further optimize secrecy capacity. The problem is solved by optimizing frequency offsets through modified artificial bee colony (M-ABC) algorithm. Numerical results show that the proposed scheme can achieve a secure transmission in MBDM system. © 2020 Jianbang Gao et al.
Number of references: 25
Main heading: Location
Controlled terms: Frequency allocation - Energy efficiency - Optimization - Antenna arrays

Uncontrolled terms: Artificial bee colonies - Confidential message - Frequency offsets - Projection matrix - Research synthesis - Secure transmission - Secure wireless communication - Wireless communications
Classification code: 525.2 Energy Conservation - 716.3 Radio Systems and Equipment - 716.4 Television Systems and Equipment - 921.5 Optimization Techniques
DOI: 10.1155/2020/4715929
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

255. Synergistic enhancements in the performances of dye-sensitized solar cells by the scattering and plasmon resonance of Au-nanoparticle multi-shell hollow nanospheres (*Open Access*)

Accession number: 20201408376114
Authors: Bai, Lihua (1); Liu, Jiaxian (2); Tang, Yiwen (3); Wang, Chun (1); Wen, Junqing (1); Wu, Hua (1); He, Wanlin (1); Sun, Ruijuan (1)
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Corresponding authors: Bai, Lihua(lhbai@xsyu.edu.cn); Tang, Yiwen(ywtang@phy.ccnu.edu.cn)
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Abbreviated source title: Int. J. Energy Res.
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Language: English
ISSN: 0363907X
E-ISSN: 1099114X
CODEN: IJERDN
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: Novel multi-shell hollow SiO2@Au@TiO2 (HSAT) nanospheres are synthesized by multi-step method. Composite photoanodes and Dye-sensitized solar cells (DSSCs) with different amount of HSAT nanospheres are studied. The study indicates that the HSAT nanospheres have enhanced the scattering and absorption of incident light in the photoanode, reduced the interface transmission resistance, increased the electron lifetime, and thus significantly improved performance of DSSCs. The maximal Jsc and photoelectric conversion efficiency (PCE) obtained in the optimal DSSC doped with HSAT of 3.0% are 15.83 mA cm-2 and 7.21%, greatly enhanced by 21.0% and 20.4%, respectively, compared with those of the pure TiO2-based DSSC. These remarkable enhancements in DSSCs performance can be attributed to the synergistic and complementary effects of the localized surface plasmon resonance and strong light scattering of HSAT nanospheres, which has significantly improved the absorption and utilization on incident light and thus the PCE of the DSSCs. Such synergistic and complementary effects of the different functions are also likely expected to play roles in the performance improvements in other solar cells. © 2020 John Wiley & Sons Ltd
Number of references: 34
Main heading: Dye-sensitized solar cells
Controlled terms: Photoelectricity - Surface scattering - Titanium dioxide - Gold nanoparticles - Light scattering - Incident light - Nanospheres - Surface plasmon resonance - TiO2 nanoparticles - Silica
Uncontrolled terms: Electron lifetime - Hollow nanospheres - Localized surface plasmon resonance - Multi step methods - Photo-electric conversion efficiency - Plasmon resonances - Scattering and absorption - Synergistic enhancement
Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 702.3 Solar Cells - 741.1 Light/Optics - 761 Nanotechnology - 801.4.1 Electrochemistry - 804.2 Inorganic Compounds - 931 Classical Physics; Quantum Theory; Relativity - 933 Solid State Physics
Numerical data indexing: Percentage 2.04e+01%, Percentage 2.10e+01%, Percentage 3.00e+00%, Percentage 7.21e+00%
DOI: 10.1002/er.5365

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Funding text: National Science Foundation of Shaanxi Province of China, Grant/Award Number: 2019JM296; National Natural Science Foundation of China, Grant/Award Numbers: 11847138, 51572102, 11747111; Scientific Research Program Funded by Shaanxi Provincial Education Department, Grant/Award Number: 19JK0667 Funding informationThis work was supported by the National Natural Science Foundation of China (Grant Nos. 11747111, 11847138, and 51572102), the National Science Foundation of Shaanxi Province of China (Grant No. 2019JM296), Scientific Research Program Funded by Shaanxi Provincial Education Department (Grant No. 19JK0667).
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256. Physical-layer security wireless transmission synthesis scheme for proximal desired receiver user and eavesdropper

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Title of translation:
Authors: Gao, Jianbang (1, 2); Yuan, Zhaohui (1); Qiu, Bin (3)
Author affiliation: (1) School of Automation, Northwestern Polytechnical University, Xi'an; 710072, China; (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) School of Electronics and Information, Northwestern Polytechnical University, Xi'an; 710072, China
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Language: Chinese
ISSN: 1001506X
CODEN: XGYDEM
Document type: Journal article (JA)
Publisher: Chinese Institute of Electronics
Abstract: For the secure wireless communication of the proximal desired receiver user and the eavesdropper, i.e., channels of the legitimate user and the eavesdropper are highly correlated, a physical-layer security wireless transmission synthesis based on frequency diverse arrays is proposed. Firstly, for the physical layer security problems for knowing locations of the eavesdropper, the optimal frequency in the crement across transmit element is obtained by the adaptive genetic algorithm to maximize the secrecy capacity. And then the artificial noise and the design projection matrix are added to reduce the signal-to-noise ratio of the eavesdropper user. Furthermore, the proposed approach is extended to the case of the unknown location of the eavesdropper. Finally, numerical results show that the proposed method can provide the satisfactory secrecy capacity. © 2020, Editorial Office of Systems Engineering and Electronics. All right reserved.
Number of references: 15
Main heading: Signal to noise ratio
Controlled terms: Genetic algorithms - Numerical methods
Uncontrolled terms: Adaptive genetic algorithms - Highly-correlated - Numerical results - Optimal frequency - Physical layer security - Projection matrix - Secure wireless communication - Wireless transmissions
Classification code: 716.1 Information Theory and Signal Processing - 921.6 Numerical Methods
DOI: 10.3969/j.issn.1001-506X.2020.05.25
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257. Research on synergistic lubrication effect of silver modified Cu–Ni-graphite composite

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Authors: Wang, Yiran (1); Gao, Yimin (1); Li, Yefei (1); Li, Mengting (1); Sun, Liang (2); Zhai, Wenyan (2); Li, Kemin (1)
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Corresponding author: Wang, Yiran(wyr1010@hotmail.com)
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Publisher: Elsevier Ltd
Abstract: Cu–Ni-graphite composite is intended to be used as switch slide baseplates in the high-speed railways., The composite is modified by silver element to enhance the tribological properties. Pin-on-disk wear tests were conducted to evaluate the tribological properties. The synergistic lubrication effect generated when the silver-modified Cu–Ni-graphite composite slide against U75V steel. The results showed that the silver-modified Cu–Ni-graphite composite consists of α–Cu, graphite, and a silver phase. The higher graphite content in the composite corresponds to lower coefficient of friction and wear weight loss. Both the coefficient of friction and wear weight loss of the silver-modified composite are much lower than those of the unmodified Cu–Ni-graphite composite. The synergistic lubrication effect of graphite and silver in the composite decrease the friction coefficients and wear weight loss. Compared with the single graphite lubrication, the introduction of the silver phase efficiently enhances the lubricating property and decreases the microcutting and deformation effects. The wear mechanism of silver-modified Cu–Ni-graphite composite with 1–6 wt% graphite content consists of microcutting, oxidation wear, and adhesion wear. The delamination and fatigue wear are resisted at the higher graphite contents by the addition of the silver phase. © 2019 Elsevier B.V.
Number of references: 37
Main heading: Friction
Controlled terms: Binary alloys - Wear of materials - Graphite - Railroad transportation - Tribology - Silver
Uncontrolled terms: Coefficient of frictions - Friction coefficients - Graphite lubrication - High - speed railways - Lubricating properties - Pin-on-disk wear test - Sliding friction - Tribological properties
Classification code: 433.1 Railroad Transportation, General - 547.1 Precious Metals - 931 Classical Physics; Quantum Theory; Relativity - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.wear.2019.203140
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Funding text: This work was supported by the National Natural Science Foundation of China (51805408); the Science and Technology Project of Guangzhou City in China (201604046009); the Natural Science Foundation of Shaanxi Province of China (2018JM5002); the Science and Technology Project of Guangdong Province in China (2015B010122003, 2015B090926009); the Guangxi Innovation-Driven Development Project (GUIKEAA18242001); the Fundamental Research Funds for the Central Universities in China. We thank Mr. Zijun Ren, Mrs. Jiao Li, Mrs. Jiamei Liu, and Mrs. Xiaoqing Wu at the Instrument Analysis Center of Xi'an Jiaotong University for their assistance with SEM, TEM, and XRD analyses.This work was supported by the National Natural Science Foundation of China (51805408); the Science and Technology Project of Guangzhou City in China (201604046009); the Natural Science Foundation of Shaanxi Province of China (2018JM5002); the Science and Technology Project of Guangdong Province in China (2015B010122003 , 2015B090926009); the Guangxi Innovation-Driven Development Project (GUIKEAA18242001); the Fundamental Research Funds for the Central Universities in China. We thank Mr. Zijun Ren, Mrs. Jiao Li, Mrs. Jiamei Liu, and Mrs. Xiaoqing Wu at the Instrument Analysis Center of Xi'an Jiaotong University for their assistance with SEM, TEM, and XRD analyses.
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258. An all small molecule organic solar cell based on a porphyrin donor and a non-fullerene acceptor with complementary and broad absorption

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Authors: Gao, Huan-Huan (1); Sun, Yanna (2); Li, Shitong (2); Ke, Xin (2); Cai, Yao (2); Wan, Xiangjian (2); Zhang, Hongtao (2); Li, Chenxi (2); Chen, Yongsheng (2)
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CODEN: DYPIDX
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: A thieno[3,2-b]thiophene-functionalized porphyrin molecule (DEP-TT) with the ethynylene bridges between the diketopyrrolopyrrole and porphyrin units has been designed and synthesized as the donor material. DEP-TT exhibits a broad absorption wavelength in the visible region with the onset absorption to 898 nm of the film and a low optical band gap of 1.38 eV. IDT-C8, as the acceptor material has a relatively strong absorption spectrum ranging from 500 to 750 nm in the solid film, which exactly fills the absorption trough of DEP-TT. The power conversion efficiency (PCE) of all small molecule increased from 0.64% (Jsc = 2.61 mA cm-2, Voc = 0.82 V, and FF = 0.30) to 5.14% (Jsc = 11.15 mA cm-2, Voc = 0.71 V, and FF = 0.65) after solvent vapor annealing. The PCE of 5.14% provided valuable recommendation based on porphyrin all small molecule system, since few work has involved in this field. © 2020 Elsevier Ltd
Number of references: 48
Main heading: Porphyrins
Controlled terms: Molecules - Synthesis (chemical) - Fullerenes - Absorption spectroscopy - Energy gap - Organic solar cells
Uncontrolled terms: Broad absorptions - Diketopyrrolopyrroles - Porphyrin molecules - Power conversion efficiencies - Small molecule systems - Small molecules - Small-molecule organic solar cells - Solvent-vapor annealing
Classification code: 702.3 Solar Cells - 761 Nanotechnology - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics
Numerical data indexing: Electron_Volt 1.38e+00eV, Percentage 5.14e+00%, Percentage 6.40e-01%, Size 5.00e-07m to 7.50e-07m, Size 8.98e-07m, Voltage 7.10e-01V, Voltage 8.20e-01V
DOI: 10.1016/j.dyepig.2020.108250
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Compendex references: YES
Database: Compendex
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259. Effect of twin boundary spacing on the deformation behaviour of Au nanowire

Accession number: 20195207901094
Authors: Hou, Zhaoyang (1); Xiao, Qixin (1); Wang, Zhen (1); Wang, Jinguo (1); Liu, Rangsu (2); Wang, Chun (3)
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The deformation behaviour of Au twinned nanowire is investigated by molecular dynamic simulation. It is found that the relationship of yield strength with twin boundary spacing (TBS) can be divided into three ranges. The deformation mechanism of Au twinned nanowire is revealed according to the dislocation–twin interactions. For those with large and medium softening TBS ranges, some Shockley partial dislocations and stair-rod dislocations are formed, and a small step is left on the TBs during the dislocation–twin interactions. But the amount of dislocations in the nanowire with medium TBS is remarkably larger than that with large TBS, and more different {111} slip planes are activated. For that with small strengthening TBS range, lots of Shockley partial dislocations are formed, and they form highly-localized shear zone at the middle of nanowire. TBs undergo a destruction and following recovery process during the dislocation–twin interactions, and the TBS is enlarged during this process. © 2019 Elsevier B.V.
Number of references: 28
Main heading: Molecular dynamics
Controlled terms: Deformation - Nanowires - Dynamics
Uncontrolled terms: Au nanowires - Deformation behaviour - Deformation mechanism - Recovery process - Shockley partial dislocations - Slip plane - Stair rod dislocations - Twin boundaries
Classification code: 761 Nanotechnology - 801.4 Physical Chemistry - 933 Solid State Physics
DOI: 10.1016/j.physb.2019.411952
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260. Study on Degradation Mechanisms of Thermal Conductivity for Confined Nanochannel in Gate-All-Around Silicon Nanowire Field-Effect Transistors

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Abstract: In this article, an analytical thermal conductivity model for confined nanochannel in gate-all-around silicon nanowire field-effect transistors (GAA SiNW FETs) is developed by considering the limitations caused by the cross section and length. A geometry dependence of phonon mean free path (MFP) is established for quantitatively analyzing the influence of cross-sectional dimension. Furthermore, the length-induced degradation mechanism is revealed by employing the transverse transportation phonon effective MFP. The results calculated by the model which was verified by published data indicate that the thermal conductivity of confined nanochannel in the GAA SiNW FETs is suffering from a severe degradation compared to that of ultrathin silicon in fully depleted (FD) silicon-on-insulator (SOI) MOSFETs. In addition to the suppression caused by the cross-sectional boundaries, the impact of the channel length should be taken into consideration during the modeling of thermal conductivity for accurately evaluating the self-heating effects (SHEs) in GAA SiNW FETs. © 1963-2012 IEEE.
Number of references: 38
Main heading: Thermal conductivity
Controlled terms: MOSFET devices - Degradation - Phonons - Silicon compounds - Nanowires - Silicon on insulator technology
Uncontrolled terms: Degradation mechanism - Induced degradation - Phonon mean free path - Self-heating effect - Silicon nanowire field-effect transistors - Silicon-on-insulator MOSFETs - Thermal conductivity model - Ultrathin silicon
Classification code: 641.1 Thermodynamics - 714.2 Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 802.2 Chemical Reactions - 933 Solid State Physics
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Funding text: Manuscript received June 16, 2020; revised July 26, 2020; accepted August 3, 2020. Date of publication August 19, 2020; date of current version September 22, 2020. This work was supported in part by the opening fund of the Key Laboratory of Silicon Device and Technology, Chinese Academy of Sciences, under Grant KLSDTJJ2019-05, in part by the Youth Scientific Research and Innovation Team, Xi'an Shiyou University, under Grant 2019QNKYCXTD10, and in part by the National Science Foundation for the Young Scholars of China under Grant 61701531. The review of this article was arranged by Editor J. Guo. (Corresponding authors: Jianhui Bu; Guohe Zhang.) Junhua Lai and Guohe Zhang are with the School of Microelectronics, Xi'an Jiaotong University, Xi'an 710049, China (e-mail: zhangguohe@ xjtu.edu.cn).This work was supported in part by the opening fund of the Key Laboratory of Silicon Device and Technology, Chinese Academy of Sciences, under Grant KLSDTJJ2019-05, in part by the Youth Scientific Research and Innovation Team, Xi?an Shiyou University, under Grant 2019QNKYCXTD10, and in part by the National Science Foundation for the Young Scholars of China under Grant 61701531.
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261. Relative permeability characteristics during carbon capture and sequestration process in low-permeable reservoirs (*Open Access*)

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Article number: 990
Language: English
E-ISSN: 19961944
Document type: Journal article (JA)
Publisher: MDPI AG
Abstract: The injection of carbon dioxide (CO2) in low-permeable reservoirs can not only mitigate the greenhouse effect on the environment, but also enhance oil and gas recovery (EOR). For numerical simulation work of this process,

relative permeability can help predict the capacity for the flow of CO2 throughout the life of the reservoir, and reflect the changes induced by the injected CO2. In this paper, the experimental methods and empirical correlations to determine relative permeability are reviewed and discussed. Specifically, for a low-permeable reservoir in China, a core displacement experiment is performed for both natural and artificial low-permeable cores to study the relative permeability characteristics. The results show that for immiscible CO2 flooding, when considering the threshold pressure and gas slippage, the relative permeability decreases to some extent, and the relative permeability of oil/water does not reduce as much as that of CO2. In miscible flooding, the curves have different shapes for cores with a different permeability. By comparing the relative permeability curves under immiscible and miscible CO2 flooding, it is found that the two-phase span of miscible flooding is wider, and the relative permeability at the gas endpoint becomes larger. © 2020 by the authors.
Number of references: 33
Main heading: Carbon dioxide
Controlled terms: Greenhouse effect - Reservoirs (water) - Carbon capture - Oil well flooding - Petroleum reservoir engineering - Mechanical permeability - Floods - Enhanced recovery - Low permeability reservoirs
Uncontrolled terms: Carbon capture and sequestrations - Displacement experiments - Empirical correlations - Experimental methods - Low permeability - Low permeable reservoirs - Relative permeability - Relative permeability curves
Classification code: 441.2 Reservoirs - 443.1 Atmospheric Properties - 451 Air Pollution - 454 Environmental Engineering - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 804.2 Inorganic Compounds
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262. Mechanism of crack initiation and propagation of 316LN stainless steel during the high temperature tensile deformation (*Open Access*)

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Authors: Fu, Jia (1); Zhang, Yishuai (2)
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Corresponding author: Zhang, Yishuai(zhangyishuai@bit.edu.cn)
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Publication year: 2020
Article number: 085801
Language: English
E-ISSN: 20531591
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: Due to the difficult deformability and cracking in forging process, the mechanism of crack initiation and propagation of 316LN stainless steel during the high-temperature tensile deformation are investigated. The thermal tension experiment is carried out on the Gleeble-1500D machine to reveal the relation between the crack propagation path and the degree of the dynamic recrystallization. By the microstructure analysis of the scanning electron microscopy (SEM) on the fracture behavior of various strains and strain rates, the dynamic recovery and dynamic recrystallization occur simultaneously, the formation of cracks was accompanied by recrystallization, and the crack propagation show both scale effect and interface effect. The intergranular ductile fracture perpendicular to the principal stress direction is found to be closely relative to the recrystallization microstructure, where the core position for crack initiation is around the intersection of the tricrystal boundaries. It is found that the tricrystal boundary cracking

from the inclusion of aluminum oxide (Al2O3) is critical to the decrease of the fracture properties and plasticity, while a certain degree of dynamic recrystallization and the dynamic recovery happened simultaneously from 1000 °C to 1200 °C benefits for the plasticity. Thus, the interface between the austenite matrix and the alumina-based brittle inclusions is easy to form local stress concentration on the tricrystal boundary due to the stacking of dislocations, which becomes the core of crack initiation and thus increases the tendency of forging cracking at high temperature. © 2020 The Author(s). Published by IOP Publishing Ltd.
Number of references: 47
Main heading: Dynamic recrystallization
Controlled terms: Crack initiation - Aluminum oxide - Textures - Alumina - Deformation - Plasticity - Strain rate - Ductile fracture - Scanning electron microscopy - Crack propagation - Dynamics - Forging
Uncontrolled terms: 316ln stainless steels - Crack initiation and propagation - Crack propagation path - Fracture behavior - Fracture property - High-temperature tensile - Local stress concentration - Microstructure analysis
Classification code: 531.1 Metallurgy - 535.2.2 Metal Forming Practice - 804.2 Inorganic Compounds - 951 Materials Science
Numerical data indexing: Temperature 1.27e+03K to 1.47e+03K
DOI: 10.1088/2053-1591/abb152
Compendex references: YES
Open Access type(s): All Open Access, Gold
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263. Controls on hydrocarbon accumulation by facies and fluid potential in large-scale lacustrine petroliferous basins in compressional settings: A case study of the Mesozoic Ordos Basin, China

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Authors: Qu, Hongjun (1); Yang, Bo (1); Gao, Shengli (2); Zhao, Junfeng (1); Han, Xing (1); Chen, Shuo (1); Hayat, Khizar (1)
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Article number: 104668
Language: English
ISSN: 02648172
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Large-scale lacustrine basins in compressional settings are an important type of petroliferous basin, and the study of the characteristics of hydrocarbon accumulation in such basins is of great significance. This synthesis paper takes the Mesozoic Ordos Basin (central China) as a case study to establish lateral and vertical hydrocarbon accumulation patterns in this basin type, and highlights how facies and fluid potential control hydrocarbon accumulation in such basins. Based on systematic analyses of the Mesozoic source rocks, sedimentary facies, migration and accumulation patterns, and characteristics of the oil reservoirs, the hydrocarbon accumulation characteristics in the Mesozoic Ordos Basin are discussed. The analysis indicates that sedimentary facies controlled the characteristics and distribution of hydrocarbon source rocks and reservoirs, while diagenetic facies controlled the quality and distribution of the reservoirs. Excess pressure and fluid potential controlled hydrocarbon migration directions and paths, whereas facies and potential controlled the locations of oil accumulations and traps. It is concluded that source rocks controlled oil-bearing regions, sedimentary facies controlled oil-bearing plays, and fluid potential controlled the locations of accumulations. For shallow intervals, because fluid migration is mainly controlled by buoyancy, paleotopographic highs played an important role in controlling hydrocarbon accumulations. For deep layers (Chang 7 to Chang 10 members), since buoyancy is less than the capillary pressure, excess pressure caused by the undercompaction of mudstone and hydrocarbon generation at depth provides the driving force for lateral and vertical migration of oil, and becomes the main migration force. The reservoir accumulation characteristics differ laterally between regions of the basin; at the periphery of the basin, reservoir units are stacked in a step-wise manner, whereas at the center of the basin, multiple

reservoir intervals are vertically stacked in the form of multistorey accumulations. Vertically, layers with different burial depths have different accumulation characteristics; the paleotopography controlled hydrocarbon accumulation in shallow intervals; instead excess pressure, fluid potential, and paleotopography controlled accumulation in deep intervals. This understanding could be used to inform prospecting in other large-scale lacustrine petroliferous basins in compressional settings such as the Eocene Green River Basin in the U.S.A. and the Middle Triassic Gunnedah Basin in Australia. © 2020 Elsevier Ltd
Number of references: 85
Main heading: Buoyancy
Controlled terms: Petroleum reservoirs - Sedimentary rocks - Metamorphic rocks - Oil bearing formations - Quality control - Hydrocarbons - Petroleum reservoir engineering - Sedimentology
Uncontrolled terms: Accumulation characteristics - Hydrocarbon accumulation - Hydrocarbon accumulation characteristics - Hydrocarbon generation - Hydrocarbon migration - Hydrocarbon source rocks - Migration and accumulation - Petroliferous basins
Classification code: 481.1 Geology - 482.2 Minerals - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 804.1 Organic Compounds - 913.3 Quality Assurance and Control - 931.2 Physical Properties of Gases, Liquids and Solids
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Funding text: This work was financially supported by the National Natural Science Foundation of China (Grants No. 41172101), the scientific team foundation of Geology Department, China Northwest University and the National Key Research and Development Project of China (No.2016YFC0601003). We would like to appreciate the PetroChina Changqing Oilfield Company and Yanchang Oil Field CO. LTD for providing data collections. We are grateful to Barry Katz and another anonymous reviewer for their many constructive comments which greatly improved the paper, and to Luca Colombera, the Associate Editor, for his patience and helpful suggestions.This work was financially supported by the National Natural Science Foundation of China (Grants No. 41172101), the scientific team foundation of Geology Department, China Northwest University and the National Key Research and Development Project of China (No. 2016YFC0601003). We would like to appreciate the PetroChina Changqing Oilfield Company and Yanchang Oil Field CO., LTD for providing data collections. We are grateful to Barry Katz and another anonymous reviewer for their many constructive comments which greatly improved the paper, and to Luca Colombera, the Associate Editor, for his patience and helpful suggestions.
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264. Flow processes of the interaction between turbidity flows and bottom currents in sinuous unidirectionally migrating channels: An example from the Oligocene channels in the Rovuma Basin, offshore Mozambique

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Authors: Chen, Yuhang (1, 2, 3, 4, 5); Yao, Genshun (4); Wang, Xiaofeng (6); Lv, Fuliang (4); Shao, Dali (4); Lu, Yintao (4); Cao, Quanbin (4); Tang, Pengcheng (4)
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Article number: 105680
Language: English
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Abstract: A number of unidirectionally migrating channels have been interpreted as the result of the interaction between turbidity flows and bottom currents. Based on the analysis of the morphology and internal architecture of channels, different conceptual models of unidirectionally migrating channels were built to reveal the flow process of the interaction between turbidity flows and bottom currents. Most previous studies mainly focused on the straight section of channels, however, the relevant models did not elucidate the flow process in sinuous sections, limiting the knowledge on the formation mechanism and evolution of the whole unidirectionally migrating channels. By using 3D seismic data, the current study not only depicted the geomorphology and internal architecture of a sinuous unidirectionally migrating channels in the Rovuma Basin, offshore Mozambique, but also quantitatively analyzed the flow processes in the straight and bend sections of the channels. The results show that the interaction between turbidity flows and the northward-flowing Antarctic Bottom Water (AABW) led to the unidirectional migration of the turbidite channels. In the straight section of channels, fine-grained material from the upper parts of turbidity flows was deflected northward via flow stripping induced by the AABW, and this material was finally deposited as sandy lateral accretion packages and muddy drifts. The lateral deposits steepened northern channel banks and forced the southward migration of channel axes. However, in the bend section of channels, the upper parts of turbidity flows were forced towards the inner (southern) bank due to the helical flow induced by centrifugal forces, which probably offset the effect of the AABW, and therefore no lateral drifts developed. The effect of bottom currents on turbidity flows is related to the relative direction of turbidity flow and bottom currents. The lateral deposition and corresponding erosion induced by bottom currents influence the formation of the unidirectionally migrating channels, and the channels migrate towards the erosional side but away from the lateral deposition. Our results can help reveal the complete flow processes and sedimentation in the unidirectionally migrating channels in deep water basins around the world. © 2020 Elsevier B.V.
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Main heading: Seismology
Controlled terms: Deposition - Sediment transport - Turbidity - Erosion - Offshore oil well production
Uncontrolled terms: Antarctic Bottom Water - Centrifugal Forces - Conceptual model - Deepwater basins - Fine-grained material - Formation mechanism - Internal architecture - Lateral accretion packages
Classification code: 484.1 Earthquake Measurements and Analysis - 511.1 Oil Field Production Operations - 741.1 Light/Optics - 802.3 Chemical Operations
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Funding Details: Number: 2019QNKYCXTD05, Acronym: -, Sponsor: -; Number: OMG18-12, Acronym: -, Sponsor: -; Number: 2016D-4303, 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: MGQNLM-KF201716, Acronym: QNLM, Sponsor: Qingdao National Laboratory for Marine Science and Technology;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

265. Effects of double-jet positions on detonation initiation characteristics

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Authors: Wang, Zhiwu (1); Pan, Zhigang (1); Huang, Jingjing (2); Wei, Lisi (1); Wang, Yaqi (3); Wang, Yafei (1)
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Source title: Aerospace Science and Technology
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Article number: 105609
Language: English
ISSN: 12709638
Document type: Journal article (JA)
Publisher: Elsevier Masson s.r.l.
Abstract: In order to initiate the detonation waves efficiently, the ignition method of two jets was proposed and utilized to initiate the mixture of H2/Air in a detonation chamber. The numerical simulation based on H2/Air detailed chemical reaction kinetics mechanism was carried out to study the influence of the two jets arrangement positions on detonation initiation. The reliability of the numerical simulation was verified by the calculation results of CEA and the experimental results. The simulation results indicated that the distance from the first jet to left end of the detonation chamber (L1) and the distance between the two jets (L2) showed significant influence on the detonation initiation process and the distribution of the reflected shock wave. The reflected wave formed by the reflection between the detonation waves from the jet tubes and the wall contributed to the propagation of the flame and the generation of the plane detonation waves. The OH concentration curve and the temperature curve were coupled. The formation and the consumption of OH was one of the main factors which controlling the detonation waves and the temperature behind the detonation waves. When L1 was greater than 10 mm, the velocity of the detonation waves decreased as L1 increased. Furthermore, when L1 and L2 both equaled to 10 mm, the velocity of the detonation wave was maximized. © 2019 Elsevier Masson SAS
Number of references: 28
Main heading: Shock waves
Controlled terms: Detonation - Pulse detonation engines - Reaction kinetics - Numerical models
Uncontrolled terms: Calculation results - Detonation chambers - Detonation initiation - Double jets - OH concentration - Reaction mechanism - Reflected shock waves - Temperature curves
Classification code: 654.2 Rocket Engines - 802.2 Chemical Reactions - 921 Mathematics - 931 Classical Physics; Quantum Theory; Relativity
Numerical data indexing: Size 1.00e-02m
DOI: 10.1016/j.ast.2019.105609
Funding Details: Number: 51306153,91441201,91741116, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017JZ011,2019JQ-462, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 3102017jg02009, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities; Number: 2017009, Acronym: -, Sponsor: Technology Foundation for Selected Overseas Scholar, Ministry of Human Resources and Social Security;
Funding text: This work was financially supported by the National Natural Science Foundation of China through Grant No. (91741116 , 51306153 , 91441201), the Natural Science Foundation of Shaanxi Province of China through Grant No. 2017JZ011 and 2019JQ-462 , Science and Technology Foundation for Selected Overseas Scholar of Shaanxi Province of China (Grant No. 2017009) and the Fundamental Research Funds for the Central Universities through Grant No. 3102017jg02009 .This work was financially supported by the National Natural Science Foundation of China through Grant No. (91741116, 51306153, 91441201), the Natural Science Foundation of Shaanxi Province of China through Grant No. 2017JZ011 and 2019JQ-462, Science and Technology Foundation for Selected Overseas Scholar of Shaanxi Province of China (Grant No. 2017009) and the Fundamental Research Funds for the Central Universities through Grant No. 3102017jg02009.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

266. Enhanced Mechanical Properties of a Gradient Nanostructured Medium Manganese Steel and Its Grain Refinement Mechanism

Accession number: 20202608876596
Authors: Wang, Lei (1); Li, Meiyu (2, 3); Tan, Hao (1); Feng, Yueming (1); Xi, Yuntao (1)
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Corresponding authors: Wang, Lei(wanglei@xsyu.edu.cn); Xi, Yuntao(ytxi@xsyu.edu.cn)
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Publication year: 2020
Pages: 3812-3823
Language: English
ISSN: 10599495
E-ISSN: 15441024
CODEN: JMEPEG
Document type: Journal article (JA)
Publisher: Springer
Abstract: As the third generation of advanced high strength steel (AHSS), medium manganese steel (MMS) has been widely emphasized by scholars around the world. Presently, we applied sliding friction treatment (SFT) of severe plastic deformation (SPD) on the surface of MMS to form surface gradient nanostructures, the formation mechanism of microstructure and the corresponding mechanical behavior was studied. The results show that the deformation layer can be divided into nano-grain (NG), submicron grain (SMG) and coarse grain (CG) in terms of grain size. It has been demonstrated that in the CG layer and a part of SMG layer, new fine grains can be formed through discontinuous dynamic recrystallization (DDR) mechanism, while continuous dynamic recrystallization (CDR) is a favorable nucleation mechanism for the new formed small grains in the SMG layer and the NG layer. The SFT process increases microhardness sharply in the surface region. Compared with conventional MMS, it is apparent that the yield strength (YS) and the ultimate tensile strength (UTS) of gradient medium manganese steel specimens have been greatly improved, while the elongation does not decrease significantly. Fracture surface analysis demonstrates that the fracture morphology of different layers can be generally characterized by different fracture mechanisms, i.e., cleavage, quasi-cleavage and dimple. © 2020, ASM International.
Number of references: 35
Main heading: Grain refinement
Controlled terms: Dynamics - High strength steel - Nanostructures - Morphology - Fracture - Grain size and shape - Surface analysis - Tensile strength - Manganese steel - Dynamic recrystallization - Mechanisms
Uncontrolled terms: Continuous dynamic recrystallization - Discontinuous dynamic recrystallization - Formation mechanism - Fracture surface analysis - Grain refinement mechanism - Nucleation mechanism - Severe plastic deformations - Ultimate tensile strength
Classification code: 531.1 Metallurgy - 545.3 Steel - 601.3 Mechanisms - 761 Nanotechnology - 931.2 Physical Properties of Gases, Liquids and Solids - 933 Solid State Physics - 951 Materials Science
DOI: 10.1007/s11665-020-04903-w
Funding Details: Number: 2018D-5007-0216, Acronym: -, Sponsor: -; Number: 18JK0604, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: The present work has been financially supported by Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 18JK0604) and China Petroleum Science and Technology Innovation Fund (2018D-5007-0216).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

267. Study on the Application of Computer Simulation Technology in the Cultivation of Professional Skills (*Open Access*)

Accession number: 20202508834910
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1544
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Issue: 1
Issue title: 2020 5th International Conference on Intelligent Computing and Signal Processing, ICSP 2020
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Publication year: 2020
Article number: 012045
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 5th International Conference on Intelligent Computing and Signal Processing, ICSP 2020
Conference date: March 20, 2020 - March 22, 2020
Conference location: Suzhou, China
Conference code: 160646
Publisher: IOP Publishing Ltd
Abstract: In view of the characteristics of computer simulation technology, the training program of professional talents is studied. Summarizing the problems existing in the training of professional skilled personnel, the aim is to perfect the method of cultivating professional skills in order to show the training value of computer simulation technology and provide reference for the development of the industry. © 2019 Published under licence by IOP Publishing Ltd.
Number of references: 7
Main heading: Personnel training
Controlled terms: Professional aspects
Uncontrolled terms: Computer simulation technology - Professional skills - Skilled personnel - Training program
Classification code: 901.1 Engineering Professional Aspects - 912.4 Personnel
DOI: 10.1088/1742-6596/1544/1/012045
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

268. Tailored interfacial crystal facets for efficient CH3NH3PbI3 perovskite solar cells

Accession number: 20195207932130
Authors: Zhu, Weidong (1); Wang, Qian (1); Chai, Weming (1); Chen, Dandan (2); Chen, Dazheng (1); Chang, Jingjing (1); Zhang, Jincheng (1); Zhang, Chunfu (1); Hao, Yue (1)
Author affiliation: (1) State Key Discipline Laboratory of Wide Band Gap Semiconductor Technology, School of Microelectronics, Xidian University, Xi'an; Shanxi; 710071, China; (2) College of Science, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Zhu, Weidong(wdzhu@xidian.edu.cn)
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Volume: 78
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Publication year: 2020
Article number: 105598
Language: English
ISSN: 15661199
CODEN: OERLAU
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Interface engineering is generally requisite for highly efficient perovskite solar cells (PSCs). However, the current interface engineering methods inevitably introduce extra modifier layers into PSCs, which not only complex the configurations and fabrication procedures, but also increase the production cost of PSCs. Herein, we propose an interface engineering strategy for PSCs by controlling the nature of Lead halide perovskite films, and specifically their interfacial grain facets. In detail, a solution-mediated secondary growth (SSG) technology is demonstrated to tailor interfacial grain facets in CH3NH3PbI3 PSC. The precise tailoring ability of interfacial grain facets is achieved

by controlling SSG temperature. When it is optimized to 60 °C, interfacial grains of CH3NH3PbI3 film can be fully transform from dodecahedral-shaped ones enclosed by (100) and (112) facets to the cubic-shaped ones enclosed by (110) and (002) facets, while maintaining the film's crystalline phase and composition. More importantly, such transitions are accompanied by significantly improved average PCE from 16.51 ± 0.64% to 18.40 ± 0.67% for the optimized CH3NH3PbI3 PSCs, benefiting from the greatly suppressed recombination and enhanced extraction of carriers. © 2019 Elsevier B.V.
Number of references: 45
Main heading: Perovskite solar cells
Controlled terms: Lead compounds - Cost engineering - Cell engineering - Perovskite
Uncontrolled terms: Carrier dynamics - Crystal facets - Crystalline phase - Fabrication procedure - Halide perovskites - Interface engineering - Interfacial crystals - Secondary growth
Classification code: 461.1 Biomedical Engineering - 482.2 Minerals - 702.3 Solar Cells - 911 Cost and Value Engineering; Industrial Economics
Numerical data indexing: Temperature 3.33e+02K
DOI: 10.1016/j.orgel.2019.105598
Funding Details: Number: 61804113,61874083,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: All the authors gratefully acknowledge the financial support from the National Natural Science Foundation of China (61804113 and 61874083), Initiative Postdocs Supporting Program (BX20190261), National Natural Science Foundation of Shaanxi Province (2018ZDCXL-GY-08-02-02 and 2017JM6049). Appendix A
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

269. Synthesis and Performance Evaluation of a Betaine Surfactant (*Open Access*)

Accession number: 20205109650403
Authors: Zhang, Rongjun (1, 2, 3); Zhou, Zhengpeng (3); Wei, Xuegang (3); Wei, Wei (4); Wang, Xiaoke (5); Zhao, Jinlin (6)
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Corresponding author: Zhang, Rongjun(rongjunzhang@xsyu.edu.cn)
Source title: E3S Web of Conferences
Abbreviated source title: E3S Web Conf.
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Issue date: December 1, 2020
Publication year: 2020
Article number: 03012
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ISSN: 25550403
E-ISSN: 22671242
Document type: Conference article (CA)
Conference name: 2nd International Conference on Applied Chemistry and Industrial Catalysis, ACIC 2020
Conference date: October 16, 2020 - October 19, 2020
Conference location: Dalian, China
Conference code: 165406
Publisher: EDP Sciences
Abstract: Using sodium bisulfite and epichlorohydrin as raw materials, the ring-opening reaction is carried out under the action of acatalyst to produce sodium 3-chloro-2-hydroxypropane sulfonate, followed by dodecyl tertiary amine, isopropanol, sodium hydroxide and 3-chloro-2-hydroxypropane sulfonate sodium as raw materials, under certain conditions to synthesize dodecyl hydroxy sulfobetaine surfactant. The surface tension, interfacial tension, salt resistance and emulsification properties of the synthesized surfactants were tested and evaluated. The experimental results show that the surfactant has a low critical micelle concentration and surface tension; the interfacial tension decreases with the increase of surfactant concentration. When the concentration is greater than or equal to 0.3%, the

interfacial tension reaches 10-2 level; the dodecyl hydroxy sulfobetaine surfactant solution shows good salt resistance; when the concentration of dodecyl hydroxy sulfobetaine surfactant solution is 0.5%, the water separation rate in 120 minutes is the lowest and the emulsification ability is the strongest. © The Authors, published by EDP Sciences, 2020.
Number of references: 6
Main heading: Surface tension
Controlled terms: Micelles - Critical micelle concentration - Emulsification - Sodium hydroxide - Amines
Uncontrolled terms: Emulsification properties - Epichlorohydrin - Ring opening reaction - Salt resistance - Sodium bisulfite - Sulfobetaine surfactants - Surfactant concentrations - Water separation
Classification code: 801.3 Colloid Chemistry - 802.3 Chemical Operations - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Percentage 3.00e-01%, Percentage 5.00e-01%, Time 7.20e+03s
DOI: 10.1051/e3sconf/202021303012
Funding Details: Number: YJSYZX20SKF0008, Acronym: -, Sponsor: -;
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Database: Compendex
Data Provider: Engineering Village

270. Dual-Phase CsPbCl3-Cs4PbCl6Perovskite Films for Self-Powered, Visible-Blind UV Photodetectors with Fast Response

Accession number: 20203809186660
Authors: Zhu, Weidong (1); Deng, Minyu (1); Chen, Dandan (2); Zhang, Zeyang (1); Chai, Wenming (1); Chen, Dazheng (1); Xi, He (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)
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Publication year: 2020
Pages: 32961-32969
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Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: All-inorganic, Cl-based perovskites are promising for visible-blind UV photodetectors (PDs), particularly the self-powered ones. However, the devices are rarely reported until now since the low solubility of raw materials hinders significantly the thickness and electronic quality of solution-processed Cl-based perovskite films. Herein, we demonstrate a simple intermediate phase halide exchange method to prepare desired dual-phase CsPbCl3-Cs4PbCl6 films. It is achieved by spin-coating of a certain dose of CH3NH3Cl/CsCl solution onto a CsI-PbBr2-dimethyl sulfoxide (DMSO) intermediate phase film, followed by thermal annealing. The inclusion of CsCl species in the solution is crucial to a stable dual-phase CsPbCl3-Cs4PbCl6 film, while a high annealing temperature contributes to improving its quality. Therefore, the dual-phase CsPbCl3-Cs4PbCl6 film with an absorption onset of ~420 nm, microsized grains, a few defects, and a proper work function is obtained by optimizing the annealing temperature. The final self-powered, visible-blind UV PD exhibits the superior performance, including a favored response range of 310-420 nm, a high responsivity (R) peak value of 61.8 mA W-1, an exceptional specific detectivity (D*) maximum of 1.35 × 1012 Jones, and a particularly fast response speed of 2.1/5.3 μs, together with amazing operational stability. This work represents the first demonstration of solution-processed, self-powered, visible-blind UV PDs with all-inorganic, Cl-based perovskite films. Copyright © 2020 American Chemical Society.
Number of references: 62
Main heading: Perovskite

Controlled terms: Cesium iodide - Photodetectors - Lead compounds - Photons - Annealing - Organic solvents - Dimethyl sulfoxide - Films - Chlorine compounds
Uncontrolled terms: Annealing temperatures - Dimethyl sulfoxide (DMSO) - Electronic quality - Intermediate phase - Operational stability - Solution-processed - Specific detectivity - UV photodetectors
Classification code: 482.2 Minerals - 537.1 Heat Treatment Processes - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics
Numerical data indexing: Size 3.10e-07m to 4.20e-07m
DOI: 10.1021/acsami.0c09910
Funding Details: Number: 61704128,61804113,61874083,BX20190261, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019M663628, Acronym: -, Sponsor: China Postdoctoral Science Foundation; Number: 2017JM6049,2018ZDCXL-GY-08-02-02, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: JB181107,JBX171103, Acronym: -, Sponsor: Fundamental Research Funds for the Central Universities;
Funding text: All authors gratefully acknowledge the financial support from the National Natural Science Foundation of China (61804113, 61874083, and 61704128), the 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 Fundamental Research Funds for the Central Universities (JB181107 and JBX171103).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

271. Influence of Ni content on the microstructure and mechanical properties of chromium carbide-nickel composites

Accession number: 20195107875013
Authors: Zhai, Wenyan (1); Pu, Bowei (1); Sun, Liang (1); Dong, Hui (1); Wang, Yiran (2); Lin, He (2); Gao, Yimin (2)
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Corresponding author: Zhai, Wenyan(zhaiwy0427@163.com)
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In this study, chromium carbide-nickel composites were fabricated by mixing pure Cr3C2 and Ni powders at 1250, 1275, 1300 and 1325 °C for 1 h. The effects of the Ni content on the microstructures and mechanical properties of these composites were researched. Both Cr3C2 and Cr7C3 showed a well-defined crystallographic orientation. Two groups: (002)Cr3C2//(004)Cr7C3 and [2¯10]Cr3C2 // [2¯10]Cr7C3 were observed. The porosity of the specimens first declined and then risen slightly with an increase in the Ni content. The micro-hardness of the specimens showed an opposite trend. The bending strength and fracture toughness of the specimens first risen with an increase in the Ni content and then decreased, thus changing the fracture mechanism from inter-granular fracture to trans-granular fracture. The optimal temperature was 1300 °C and the composite with 20 wt% Ni showed the best mechanical properties. © 2019
Number of references: 22
Main heading: Sintering
Controlled terms: Fracture - Microhardness - Nickel - Chromium compounds - Bending strength - Fracture toughness - Microstructure - Carbides
Uncontrolled terms: Chromium carbide - Crystallographic orientations - Fracture mechanisms - Intergranular fracture - Microstructure and mechanical properties - Microstructures and mechanical properties - Nickel-composites - Optimal temperature

Classification code: 548.1 Nickel - 804.2 Inorganic Compounds - 812.1 Ceramics - 951 Materials Science
Numerical data indexing: Temperature 1.57e+03K, Temperature 1.60e+03K, Time 3.60e+03s
DOI: 10.1016/j.ceramint.2019.12.114
Funding Details: Number: -, Acronym: -, Sponsor: Kementerian Perindustrian Republik Indonesia;
Funding text: The authors thank to the Ministry of Industry of Indonesia for the financial support through the PhD
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

272. First-principles study on electronic structure, elasticity, debye temperature and anisotropy of cubic kcaf3

Accession number: 20203008973984
Authors: Liu, Xing (1, 2); Fu, Jia (2); Han, Manman (2); Sun, Kaixin (2); Wei, Shengli (2)
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Corresponding author: Fu, Jia(fujia@xsyu.edu.cn)
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CODEN: MSFOEP
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Document type: Conference article (CA)
Conference name: 2nd International Conference on Clean Energy Materials and Technology, ICCEMT 2019
Conference date: November 29, 2019 - December 1, 2019
Conference location: Suzhou, China
Conference code: 241589
Publisher: Trans Tech Publications Ltd
Abstract: As a potential functional material in the perovskite family, the KCaF3 on electronic structure, elasticity, Debye temperature and anisotropy are studied based on density functional theory (DFT). Above all, the structural parameters of KCaF3 crystal are optimized. Then the elastic constants and Debye temperature are calculated. The results show that: (1) KCaF3 is composed of covalent bonds, in which the Ca-F bond is stronger than K-F. (2) Ca atom mainly contributes for the electronic properties of KCaF3. (3) The structural parameters of KCaF3 is in fair agreement with the experimental data. (4) The anisotropy of KCaF3 was analyzed from the pure and quasi waves, of which the longitudinal wave velocity in the direction of [100] is the larger than the others two directions ([110] and [111]). Finally, The homogenized elastic moduli, Pugh and Poisson ratio are obtained. This research is meaningful and thus to provides a good theoretical guidance for the design the new ABX3-type material with better performance. © 2020 Trans Tech Publications Ltd, Switzerland.
Number of references: 34
Main heading: Electronic structure
Controlled terms: Design for testability - Perovskite - Acoustic wave velocity - Fluorine compounds - Electronic properties - Elasticity - Debye temperature - Structural properties - Wave propagation - Functional materials - Anisotropy - Density functional theory - Specific heat - Structural design
Uncontrolled terms: First-principles study - Longitudinal wave velocity - Structural parameter - Two directions
Classification code: 408 Structural Design - 408.1 Structural Design, General - 482.2 Minerals - 641.1 Thermodynamics - 751.1 Acoustic Waves - 922.1 Probability Theory - 931.2 Physical Properties of Gases, Liquids and Solids - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science
DOI: 10.4028/www.scientific.net/MSF.999.109
Funding Details: Number: 51905427, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by National Natural Science Foundation of China (No. 51905427).

Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

273. Corrosion Behavior of Titanium Alloy in High pH Value Completion Fluid

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Title of translation: pH
Authors: Lv, Xianghong (1); Liu, Lele (1); Li, Jian (1); Yu, Haobo (2); Xie, Junfeng (3)
Author affiliation: (1) Xi'an Shiyou University, School of Material Science and Engineering, Xi'an; 710065, China; (2) China University of Petroleum-Beijing, Beijing; 102249, China; (3) Petroleum Engineering Institute, PetroChina Tarim Oilfield Company, Kuerle; 841000, China
Corresponding author: Lv, Xianghong(lxhong71@sina.com.cn)
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Document type: Journal article (JA)
Publisher: Science Press
Abstract: Based on corrosion rate and in-situ electrochemical tests under high temperature and pressure, and combined with the Molecular Dynamic simulation and First-principle calculations, the corrosion behavior of titanium alloy (TC4) oil tube in high pH completion fluid was clarified, and the thermodynamic stability of passive film was also investigated. The results show that the corrosion of TC4 alloy is serious in the high pH completion fluid at 180, and the uniform corrosion rate is as high as 0.4429 mm/a. The corrosion of TC4 in the high pH completion fluid is dominated as an anodic reaction controlled process. If temperature increases, the corrosion potential, the resistance of corrosion scale film and the polarization resistance will dramatically decrease, and the thermodynamic driving will be enhanced, while the dynamic resistance will be reduced. So, the corrosion current of TC4 will be significantly increased. The Ti-O bonds in the TiO2 passive film tends to break in the alkaline solution. With the increase of temperature and alkalinity, the interfacial binding energy between TiO2 and solution increases; therefore, the thermodynamic stability of passive film decreases. In alkaline potassium pyrophosphate solution, TiO2 passive film can react with K2HPO4 and K3PO4 to form porous KTiOPO4 corrosion scale; however, the thermodynamic reaction tendency between TiO2 and K3PO4 is more preferable. © 2020, Science Press. All right reserved.
Number of references: 15
Main heading: Temperature
Controlled terms: Binding energy - Corrosive effects - High temperature corrosion - Corrosion resistance - Potassium compounds - Corrosion rate - Passivation - Thermodynamic stability - Titanium dioxide - Alkalinity - Titanium alloys - Molecular dynamics
Uncontrolled terms: Corrosion potentials - Dynamic resistance - Electrochemical test - First principle calculations - High temperature and pressure - Interfacial binding - Polarization resistances - Temperature increase
Classification code: 539.1 Metals Corrosion - 539.2.1 Protection Methods - 542.3 Titanium and Alloys - 641.1 Thermodynamics - 801.1 Chemistry, General - 801.4 Physical Chemistry - 804.2 Inorganic Compounds
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

274. Synthesis and antirust properties of phosphate esterified styrene-acrylic copolymer emulsion

Accession number: 20200908214838
Title of translation:
Authors: Cheng, Hanghang (1); Shen, Yiding (1); Ma, Guoyan (2); Yang, Kai (1); Hou, Xuming (1)

Author affiliation: (1) Shaanxi Key Laboratory of Light Chemical Engineering Auxiliaries, Shaanxi University of Science & Technology, Xi'an; Shaanxi; 710021, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Shen, Yiding(ydshen@sust.edu.cn)
Source title: Jingxi Huagong/Fine Chemicals
Abbreviated source title: Jingxi Huagong
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Issue date: January 15, 2020
Publication year: 2020
Pages: 180-188
Language: Chinese
ISSN: 10035214
CODEN: JIHUFJ
Document type: Journal article (JA)
Publisher: Fine Chemicals
Abstract: The phosphorylated styrene-acrylic antirust emulsion (PM-2-SP) with core-shell structure was synthesized by semi-continuous seeded emulsion polymerization using methacrylic acid (MAA) as hydrophilic monomer, hydroxypropyl methacrylate (HPMA) as crosslinking monomer, styrene (St) and methyl methacrylate (MMA) as hard monomer, butyl acrylate (BA) as soft monomer, 2-hydroxyethyl methacrylate phosphate (PM-2) as functional monomer and dodecanethiol as segment regulator. The effects of PM-2 dosage on the stability of PM-2-SP emulsion, water resistance of PM-2-SP film and antirust properties of film were studied. The size and morphology of the PM-2-SP emulsion particles were characterized by DLS and TEM. The surface of the film was observed by AFM. The corrosion resistance of paint film was tested by salt spray tester. The results showed that when PM-2 dosage was 4% (based on the total mass of monomers, the same below), the prepared PM-2-SP emulsion had core-shell structure and exhibited good stability performance, which had a particle size of 135.7 nm and PDI of 0.150. The film had smooth and compact surface and excellent water resistance. Compared with those of pure styrene-acrylic paint film, the corrosion potential of the PM-2-SP paint film was -0.391 V, which was an improvement of 47.16%, while the corrosion current reached 1.95×10-7 A/cm2, decreased by 94.76%. The salt spray resistance test proved that the styrene-acrylic emulsion with core-shell structure had higher chelating density with metal ion than homopolymerized styrene-acrylic emulsion, and exhibited excellent antirust performance, and the salt spray resistance time reached 144 h. © 2020, Editorial Office of FINE CHEMICALS. All right reserved.
Number of references: 24
Main heading: Emulsification
Controlled terms: Shells (structures) - Atmospheric corrosion - Hydrophilicity - Paint - Metal ions - Particle size - Emulsion polymerization - Esters - Metals - Acrylic monomers - Corrosion resistance - Styrene - Seawater corrosion - Morphology
Uncontrolled terms: 2-hydroxyethyl methacrylate - Crosslinking monomers - Hydrophilic monomers - Performance tests - Semi-continuous seeded emulsion polymerization - Styrene acrylic paints - Styrene-acrylic copolymers - Styrene-acrylic emulsion
Classification code: 408.2 Structural Members and Shapes - 443.1 Atmospheric Properties - 471.4 Seawater, Tides and Waves - 531.1 Metallurgy - 539.1 Metals Corrosion - 802.3 Chemical Operations - 804.1 Organic Compounds - 813.2 Coating Materials - 815.2 Polymerization - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 4.00e+00%, Percentage 4.72e+01%, Percentage 9.48e+01%, Size 1.36e-07m, Time 5.18e+05s, Voltage -3.91e-01V
DOI: 10.13550/j.jxhg.20190414
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

275. Corrosion failure and SCC mechanism of super 13Cr tubings in high pH completion fluid

Accession number: 20201108299286
Title of translation: pH13CrSCC
Authors: Lü, Xianghong (1); Zhang, Ye (1); Xie, Junfeng (2); Xue, Yan (3); Wang, Chen (1)

Author affiliation: (1) School of Material Science and Engineering in Xi'an Shiyou University, Xi'an; 710065, China; (2) Petroleum Engineering Institute, PetroChina Tarim Oilfield Company, Kuerle; 841000, China; (3) Xi'an Maurer Petroleum Engineering Laboratory, Company Limited, Xi'an; 710065, China
Source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)
Abbreviated source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)
Volume: 44
Issue: 1
Issue date: February 20, 2020
Publication year: 2020
Pages: 141-148
Language: Chinese
ISSN: 16735005
Document type: Journal article (JA)
Publisher: University of Petroleum, China
Abstract: Based on the cracking mechanism, corrosion morphology, corrosion products and finite element analysis of super 13Cr tubings in a failed high-pressure gas well, the corrosion failure and stress corrosion cracking (SCC) mechanisms of super 13Cr tubings in the high pH completion fluid were probed. The result shows that in the high pH completion fluid, the super 13Cr tubing has suffered from SCC, and most cracks originate from the local corrosion pits on the outer wall of the tubing. The crack growth transited from the transgranular cleavage-like cracking to the intergranular cracking.The outer wall of the super 13Cr tubing was significantly corroded, and the thickness of the corrosion product layer increases greatly with the increase of the well depth. The three layers are the Ca3(PO4)2 deposition product film, FeCr2O4 high-temperature oxidation product film and Fe3O4 main corrosion product film from the outside to the inside of the tube, where the Fe3O4 corrosion product film takes the phenomenon of bidirectional growth. The corrosion mechanism of super 13Cr tubings in the working environment is the reaction-diffusion process of metal ions and oxygen ions in the oxidation film and corrosion product film. The SCC mechanism is dominated by the anodic-dissolution, accompanied by the film-induced cleavage, and the existence of fatigue load promotes the initiation and growth of SCC cracks.
Number of references: 22
Main heading: Stress corrosion cracking
Controlled terms: Diffusion in liquids - Textures - Failure (mechanical) - High temperature corrosion - Magnetite - Metal ions - Steel corrosion - Tubing - Calcium compounds - Chromium compounds - Cracks - Metals - Thermooxidation - Metal working
Uncontrolled terms: Cleavage-like crackings - Completion fluids - Corrosion failures - Corrosion mechanisms - Corrosion product film - Corrosion product layers - High pressure gas wells - Reaction-diffusion process
Classification code: 531.1 Metallurgy - 535.2.2 Metal Forming Practice - 539.1 Metals Corrosion - 545.3 Steel - 619.1 Pipe, Piping and Pipelines - 802.2 Chemical Reactions
DOI: 10.3969/j.issn.1673-5005.2020.01.016
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

276. Erratum: Metal salt assisted electrospray ionization mass spectrometry for the soft ionization of GAP polymers in negative ion mode (Analyst (2020) (145, 34-45) DOI: 10.1039/C9AN01887E) (*Open Access*)

Accession number: 20201508391002
Authors: Muyizere, Theoneste (1); Zheng, Yajun (1); Liu, Hongni (2); Zhao, Jia (1); Li, Jin (1); Lu, Xianming (2); Austin, Daniel E. (3); Zhang, Zhiping (1)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) Xi'An Modern Chemistry Research Institute, Xi'an; 710065, China; (3) Department of Chemistry and Biochemistry, Brigham Young University, Provo; UT; 84602, United States
Corresponding author: Zhang, Zhiping(zhangzp0304@gmail.com)
Source title: Analyst
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Volume: 145
Issue: 7
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Language: English
ISSN: 00032654
E-ISSN: 13645528
CODEN: ANALAO
Document type: Erratum (ER)
Publisher: Royal Society of Chemistry
Abstract: The authors regret that the caption and note for Table 2 were incorrect in the original article. The correct version of Table 2 is shown below. (Table Presented). The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers. © The Royal Society of Chemistry 2020.
DOI: 10.1039/d0an90027c
Open Access type(s): All Open Access, Hybrid Gold
Database: Compendex
Data Provider: Engineering Village

277. Two-step synthesis of B and N co-doped porous carbon composites by microwave-assisted hydrothermal and pyrolysis process for supercapacitor application

Accession number: 20203609139498
Authors: Luo, Lu (1); Zhou, Yalan (1); Yan, Wen (1); Wu, Xi (1); Wang, Shirui (2); Zhao, Weigang (1)
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Corresponding author: Zhao, Weigang(weigang-zhao@fafu.edu.cn)
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Abbreviated source title: Electrochim Acta
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Issue date: 10 November 2020
Publication year: 2020
Article number: 137010
Language: English
ISSN: 00134686
CODEN: ELCAAV
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: A series of nitrogen and boron co-doped porous carbon composites (BNCs) were obtained using quick, easy and environmentally microwave-assisted hydrothermal treatment combined with a pyrolysis process subsequent. Biomass waste of fir bark is used as the carbon precursor, while ammonium pentaborate tetrahydrate is used as both boron (B) and nitrogen (N) source. The synthesis process and characteristics of the developed BNCs are investigated, and the results show that the N and B is successfully doped, generating a synergetic effect on the structure, surface characteristics and electrochemical properties. The BNCs achieves specific surface area up to 955 m2 g-1 with mainly microporosity, and possess 10–13 % of B and 15~20 % of N content. The gravimetric capacitance values for the electrodes containing BNC-20 active materials is 188 F g-1 at 0.5 A g-1, 2 times that of non-doped carbon, while maintaining 90% capacitance retention capability after 10,000 charge/discharge cycles. Furthermore, the assembled symmetric cell yielded high performance of volumetric capacitive of 91 F cm-3 at 0.5 A g-1, superior energy density of 9.33 Wh kg-1 at 400 W kg-1 with 91% capacitance retention after 10,000 charge/discharge cycles at 1 A g-1. Our work offers a potential relatively low-cost, effective and environmentally design of heteroatoms doped electrode materials with enhanced supercapacitors performance. © 2020 Elsevier Ltd
Number of references: 55
Main heading: Supercapacitor
Controlled terms: Nitrogen - Boron - Capacitance - Electrodes - Hydrothermal synthesis - Pyrolysis - Porous materials - Carbon carbon composites
Uncontrolled terms: Ammonium pentaborate - Capacitance retention - Charge/discharge cycle - Electrode material - Gravimetric capacitance - Microwave-assisted hydrothermal - Supercapacitor application - Surface characteristics
Classification code: 415.4 Structural Materials Other Than Metal, Plastics or Wood - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 701.1 Electricity: Basic Concepts and Phenomena - 704.1 Electric Components - 802.2 Chemical Reactions - 804 Chemical Products Generally - 951 Materials Science
Numerical data indexing: Percentage 1.50e+01% to 2.00e+01%, Percentage 9.00e+01%, Percentage 9.10e+01%

DOI: 10.1016/j.electacta.2020.137010
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

278. Boron and nitrogen co-doped porous carbon for supercapacitors: A comparison between a microwave-assisted and a conventional hydrothermal process

Accession number: 20203509105632
Authors: Zhou, Yalan (1); Yan, Wen (1); Yu, Xiya (1); Chen, Tingting (1); Wang, Shirui (2); Zhao, Weigang (1)
Author affiliation: (1) College of Material Engineering, Fujian Agriculture and Forestry University, 63 Xiyuangong Road, Fuzhou; 350018, China; (2) College of Material Science and Engineering, Xi'an Shiyou University, 18 Dianzier Road, Xi'an; 710065, China
Corresponding author: Zhao, Weigang(weigang-zhao@fafu.edu.cn)
Source title: Journal of Energy Storage
Abbreviated source title: J. Energy Storage
Volume: 32
Issue date: December 2020
Publication year: 2020
Article number: 101706
Language: English
E-ISSN: 2352152X
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: An ultrafast synthesis method is proposed for a boron and nitrogen co-doped porous carbon using biomass material as a precursor through a combination of a microwave-assisted hydrothermal method (MHT) followed by a pyrolysis process. Compared with a conventional hydrothermal carbonization method (HTC), the MHT method exhibits unparalleled advantages, such as a high energy efficiency and a uniform and ultrafast reaction. The pore structure, elemental composition and electrochemical performance of the materials from the two methods were studied and compared. The results showed that when water was used as the solvent, a porous texture with a surface area of 823 m2 g-1 was obtained by the HTC after 24 h; in contrast, a similar surface area of 813 m2 g-1 could be easily obtained in only 20 min with MHT. Furthermore, when boric acid was used as the solvent, MHT-20min-10% presented similar heteroatom (B and N) contents as the HTC sample but with a significantly improved surface area (994 vs. 666 m2 g-1) and specific capacitance (120 vs. 106 F g-1) compared to those of HTC-24h-10%. Therefore, compared with the HTC, MHT is an ultrafast synthesis method and also is the best option to obtain high surface area porous carbon materials doped with B and N heteroatoms with suitable pore size distribution, which are beneficial in electrode materials for supercapacitors. © 2020 Elsevier Ltd
Number of references: 50
Main heading: Boron
Controlled terms: Boric acid - Carbon - Pore structure - Supercapacitor - Carbonization - Textures - Energy efficiency - Pore size - Hydrothermal synthesis - Nitrogen
Uncontrolled terms: Electrochemical performance - Elemental compositions - High energy efficiency - Hydrothermal carbonization - Hydrothermal process - Microwave-assisted hydrothermal - Porous carbon materials - Specific capacitance
Classification code: 525.2 Energy Conservation - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 704.1 Electric Components - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Time 1.20e+03s
DOI: 10.1016/j.est.2020.101706
Funding Details: Number: 2019J01386, Acronym: -, Sponsor: -; Number: 31971593, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Natural Science Foundation of Fujian Province;
Funding text: This research was funded by National Natural Science Foundation of China, grant number 31971593 and by the Natural Science Foundation of Fujian Province Department of Science and Technology, grant number

2019J01386.This research was funded by National Natural Science Foundation of China , grant number 31971593 and by the Natural Science Foundation of Fujian Province Department of Science and Technology , grant number 2019J01386 .
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

279. Performance comparison of novel chemical agents for mitigating water-blocking problem in tight gas sandstones

Accession number: 20204909573103
Authors: Huang, Hai (1, 2); Babadagli, Tayfun (1, 3); Chen, Xin (3); Li, Huazhou (1, 3); Zhang, Yanming (4)
Author affiliation: (1) Xi'an Shiyou University, China; (2) Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil and Gas Reservoirs; (3) University of Alberta, Canada; (4) Oil and Gas Technology Research Institute of Changqing Oilfield Company
Corresponding author: Chen, Xin
Source title: SPE Reservoir Evaluation and Engineering
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Volume: 23
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Issue date: November 2020
Publication year: 2020
Pages: 1150-1158
Language: English
ISSN: 10946470
Document type: Journal article (JA)
Publisher: Society of Petroleum Engineers (SPE)
Abstract: Water blocking can be a serious problem, causing a low gas production rate after hydraulic fracturing, a result of the strong capillarity in the tight sandstone reservoir aggravating the spontaneous imbibition. Fortunately, chemicals added to the fracturing fluids can alter the surface properties and thus prevent or reduce the water-blocking issue. We designed a spontaneous imbibition experiment to explore the possibility of using novel chemicals to both mitigate the spontaneous imbibition of water into the tight gas cores and measure the surface tensions (STs) between the air and chemical solutions. A diverse group of chemical species has been experimentally examined in this study, including two anionic surfactants (O242 and O342), a cationic surfactant (C12TAB), an alkaline solution of sodium metaborate (NaBO2), an ionic liquid (BMMIM BF4), two nanofluids with aluminum oxide and silicon oxide (Al2O3 and SiO2, respectively), and a series of deep eutectic solvents (DES3-7, 9, 11, and 14). Experimental results indicate that the anionic surfactants (O242 and O342) contribute to low STs but cannot ease the water-blocking issue because they yield a more water-wet surface. The high pH solution (NaBO2), ionic liquid (BMMIM BF-4), and sodium chloride brine (NaCl) significantly decrease the volume of water imbibed to the tight sandstone core through wettability alteration, and C12TAB leads to both ST reduction and an air-wet rock surface, helping to prevent water blocking. The different types of DESs and nanofluids exhibit distinctly different effects on expelling gas from the tight sandstone cores through water imbibition. This preliminary research will be useful in both selecting and using proper chemicals in fracturing fluids to mitigate water-blocking problems in tight gas sandstones. Copyright © 2020 Society of Petroleum Engineers
Number of references: 46
Main heading: Anionic surfactants
Controlled terms: Drilling fluids - Sodium chloride - Hydraulic fracturing - Tight gas - Cationic surfactants - Alumina - Alkalinity - Fracturing fluids - Ionic liquids - Sandstone - Silica - Aluminum oxide - Gases - Indicators (chemical)
Uncontrolled terms: Chemical solutions - Deep eutectic solvents - Performance comparison - Sodium chloride brine - Spontaneous imbibition - Tight gas sandstones - Tight sandstone reservoirs - Wettability alteration
Classification code: 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 801 Chemistry - 801.1 Chemistry, General - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds
DOI: 10.2118/199282-PA
Funding Details: Number: RES0011227,RGPIN 05394, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: 201806450029, Acronym: CSC, Sponsor: China Scholarship Council; Number: 2016ZX05047003-004, Acronym: -, Sponsor: National Science and Technology Major Project; Number: 51874240, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 15JS086, Acronym: -, Sponsor: -;

Funding text: We wrote this paper while Tayfun Babadagli and Huazhou Li were residing at Xi'an Shiyou University (China) as guest professors in 2019. This research was conducted under the T. Babadagli's NSERC Industrial Research Chair in Unconventional Oil Recovery (industrial partners are BASF, Devon, Husky Energy, Petroleum Development Oman, Saudi Aramco, Suncor, and Total E&P Recherché Développement). We gratefully acknowledge the support provided through a NSERC Discovery Grant (No: RES0011227) to T. Baba-dagli and a NSERC Discovery Grant (No: NSERC RGPIN 05394) to H. Li. We are also grateful for the financial support provided by National Science and Technology Major Project (No: 2016ZX05047003-004), National Natural Science Foundation of China (No: 51874240), and the Key Laboratory Fund of Education Department of Shaanxi Province (No: 15JS086) to H. Huang. X. Chen acknowledges the PhD Scholarship from the China Scholarship Council (CSC) (201806450029). Finally, we thank L. Lin for assistance during the experimental work.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

280. Influence of molybdenum content and load on the tribological behaviors of in-situ Cr3C2-20 wt % Ni composites

Accession number: 20200608142016
Authors: Zhai, Wenyan (1); Pu, Bowei (1); Sun, Liang (1); Wang, Yiran (2); Dong, Hui (1); Gao, Qian (1); He, Lin (2); Gao, Yimin (2)
Author affiliation: (1) College of Materials Science and Engineering, Xi'an Shiyou University, Xi'an; Shaanxi Province; 710065, China; (2) State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, Xi'an; Shaanxi Province; 710049, China
Corresponding author: Zhai, Wenyan(zhaiwy0427@163.com)
Source title: Journal of Alloys and Compounds
Abbreviated source title: J Alloys Compd
Volume: 826
Issue date: 15 June 2020
Publication year: 2020
Article number: 154180
Language: English
ISSN: 09258388
CODEN: JALCEU
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In this study, Mo elements (0.5 wt %, 1.0 wt %, and 1.5 wt %) were doped by the powder metallurgic method to improve the abrasion resistance of in-situ Cr3C2-20 wt % Ni composites. The dry sliding friction experiments against Al2O3 ceramic were systematically investigated under different loads (25 N, 50 N, 75 N, and 100 N) at room temperature. Experimental results indicated that the hardness, bending strength, and fracture toughness of Cr3C2-20 wt % Ni composites increased with an increase in the Mo content due to the grain refinement and solution strengthening. The coefficient of friction and wear rate of theses composites risen with an increase in the load, thus changing the wear mechanism from abrasive wear and partial oxidation wear to serious fatigue wear. The tribological behaviors of in-situ Cr3C2-20 wt % Ni composites were obviously improved by doping Mo, which accomplished by the superior mechanical properties of Cr7C3 phases and the formation of lubricated MoO3. © 2020 Elsevier B.V.
Number of references: 37
Main heading: Aluminum oxide
Controlled terms: Alumina - Chromium compounds - Molybdenum oxide - Powder metallurgy - Friction - Bending strength - Fracture toughness - Tribology - Abrasion - Grain refinement - Molybdenum
Uncontrolled terms: Coefficient of frictions - Dry sliding friction - Molybdenum content - Partial oxidations - Powder metallurgic methods - Solution strengthening - Tribological behaviors - Wear mechanisms
Classification code: 543.3 Molybdenum and Alloys - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 931 Classical Physics; Quantum Theory; Relativity - 951 Materials Science
Numerical data indexing: Force 1.00e+02N, Force 2.50e+01N, Force 5.00e+01N, Force 7.50e+01N
DOI: 10.1016/j.jallcom.2020.154180
Funding Details: Number: 2019JQ-821, Acronym: -, Sponsor: -; Number: HKDNM2019018, Acronym: -, Sponsor: -; Number: 20192110, Acronym: -, Sponsor: State Key Laboratory for Mechanical Behavior of Materials;
Funding text: This work was supported by the Open Fund of State Key Laboratory for Mechanical Behavior of Materials (20192110), the Open Fund of National Joint Engineering Research Center for Abrasion Control and

Molding of Metal Materials (HKDNM201811 and HKDNM2019018) and the Natural Science Basic Research Plan in Shaanxi Province of China (2019JQ-821).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

281. Fatigue failure analysis of dented pipeline and simulation calculation

Accession number: 20201908619538
Authors: Luo, Jinheng (1, 2); Zhang, Yani (3); Li, Lifeng (1, 2); Zhu, Lixia (1, 2); Wu, Gang (1, 2)
Author affiliation: (1) CNPC Tubular Goods Research Institute, Xi'an; Shaanxi; 710077, China; (2) State Key Laboratory of Performance and Structural Safety for Petroleum Tubular Goods and Equipment Material, Xi'an; Shaanxi; 710077, China; (3) Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Luo, Jinheng
Source title: Engineering Failure Analysis
Abbreviated source title: Eng. Fail. Anal.
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Issue date: July 2020
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Article number: 104572
Language: English
ISSN: 13506307
CODEN: EFANEM
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Natural gas pipeline leaks may cause considerable damage to people, properties, and the surrounding environment. This study investigates a dent leak in a gas pipeline in China that has operated for six years. The failure pipe section meets American Petroleum Institute (API) specification 5L-2012 standard for carbon steel pipelines. The cause of leakage is evaluated not only through visual examination, micromorphology observation, structural deformation analysis, and residual stress measure of the dented region near the leak point of the pipe body, but also through finite element analysis on the deformation and stress of the pipe under different loads. The dent formation is related to rocks during pipeline laying. Under the combined effect of external load and internal pressure, the maximum equivalent stresses of the dented edge at the outer wall, bulge top of the inner wall, and dented edge of the inner wall are greater than the yield stress of the material. Moreover, micro-crack formation occurs due to the maximum deformation at the bottom of the dent and the maximum equivalent stress on top of the inner surface bulge. Under alternating stress, microcracks gradually expand until they penetrate the wall thickness, and thereby cause pipeline leakages. © 2020
Number of references: 23
Main heading: Finite element method
Controlled terms: Deformation - Fatigue of materials - Failure (mechanical) - Yield stress
Uncontrolled terms: American Petroleum Institute - Carbon steel pipelines - Deformation and stress - Fatigue failure analysis - Microcrack formation - Simulation calculation - Structural deformation analysis - Surrounding environment
Classification code: 921.6 Numerical Methods - 951 Materials Science
DOI: 10.1016/j.engfailanal.2020.104572
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

282. Enhanced valleytronic properties in germanene by direct proximity to heavy metal layer

Accession number: 20205309701174
Authors: Qu, Jinfeng (1); Luo, Chaobo (2); Peng, Xiangyang (2); Chen, Guoxiang (1); Guo, Shaoli (1); Zhong, Jianxin (2)
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Corresponding author: Peng, Xiangyang(xiangyang_peng@xtu.edu.cn)
Source title: Journal of Physics Condensed Matter

Abbreviated source title: J Phys Condens Matter
Volume: 33
Issue: 9
Issue date: 2020
Publication year: 2020
Article number: 095502
Language: English
ISSN: 09538984
E-ISSN: 1361648X
CODEN: JCOMEL
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: Germanene, though with Dirac valleys, is not deemed as a good valleytronic material due to its minute band gap, negligible spin-orbit coupling and spatial inversion symmetry. In comparison of interfacing germanene with MoS2, we proposed that forming heterostructure with Tl2S, an anti-MoS2 material with two outer heavy metal layers, could be more effective in raising spin-orbit coupling and band gap in germanene due to the direct Ge-metal contact. By carrying out first-principles calculations, we studied the valleytronic properties of germanene enhanced by monolayer Tl2S. It is found that the Ge-Tl direct interaction is strong to a proper extent so that the valleys of germanene still persist and simultaneously the valley gap is drastically increased from 23 to 370 meV. The valley spin splitting, being zero in pristine germanene, become 45 meV, which is opposite at inequivalent valleys owing to the time reversal symmetry. The inversion symmetry of germanene is broken by Tl2S, resulting in large Berry curvature near the valleys and hence laying the ground for Berry phase physics in germanene, e.g., valley spin Hall effect and valley-spin locking, as revealed in our study. The calculations found a perfect valley-selective circular dichroism, by which the valley and spin degrees of freedom can be manipulated selectively and correlatively. © 2020 IOP Publishing Ltd.
Number of references: 43
Main heading: Density functional theory
Controlled terms: Dichroism - Molybdenum compounds - Calculations - Degrees of freedom (mechanics) - Layered semiconductors - Heavy metals - Spin Hall effect - Selenium compounds - Transition metals - Crystal symmetry - Energy gap - Landforms - Fruits - Monolayers - Sulfur compounds
Uncontrolled terms: Direct interactions - First-principles calculation - Inversion symmetry - Metal contacts - Spatial inversion symmetry - Spin degrees of freedom - Spin splittings - Time reversal symmetries
Classification code: 481.1 Geology - 531 Metallurgy and Metallography - 701.2 Magnetism: Basic Concepts and Phenomena - 712.1 Semiconducting Materials - 741.1 Light/Optics - 821.4 Agricultural Products - 921 Mathematics - 922.1 Probability Theory - 931.1 Mechanics - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 933.1.1 Crystal Lattice
Numerical data indexing: Electron_Volt 2.30e-02eV to 3.70e-01eV, Electron_Volt 4.50e-02eV
DOI: 10.1088/1361-648X/abcdb1
Funding Details: Number: 2019JQ-334,2020JQ-783, Acronym: -, Sponsor: -; Number: IRT_17R91, Acronym: -, Sponsor: -; Number: 11304246,11874315,11874316, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 20JK0849, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: CX20190472, Acronym: -, Sponsor: Hunan Provincial Innovation Foundation for Postgraduate; Number: 2015CB921103, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
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Compendex references: YES
Database: Compendex
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283. NOxemissions and nitrogen fate at high temperatures in staged combustion (*Open Access*)

Accession number: 20203509099847
Authors: Wu, Song (1); Che, Defu (2); Wang, Zhiguo (1); Su, Xiaohui (1)

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Corresponding author: Wu, Song(songwu@xsyu.edu.cn)
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Article number: 3557
Language: English
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Document type: Journal article (JA)
Publisher: MDPI AG, Postfach, Basel, CH-4005, Switzerland
Abstract: Staged combustion is an effective technology to control NOx emissions for coal-fired boilers. In this paper, the characteristics of NOx emissions under a high temperature and strong reducing atmosphere conditions in staged air and O2/CO2 combustion were investigated by CHEMKIN. A methane flame doped with ammonia and hydrogen cyanide in a tandem-type tube furnace was simulated to detect the effects of combustion temperature and stoichiometric ratio on NOx emissions. Mechanism analysis was performed to identify the elementary steps forNOx formation and reduction at high temperatures. The results indicate that in both air and O2/CO2 staged combustion, the conversion ratios of fuel-N to NOx at the main combustion zone exit increase as the stoichiometric ratio rises, and they are slightly affected by the combustion temperature. The conversion ratios at the burnout zone exit decrease with the increasing stoichiometric ratio at low temperatures, and they are much higher than those at the main combustion zone exit. A lot of nitrogen compounds remain in the exhaust of the main combustion zone and are oxidized to NOx after the injection of a secondary gas. Staged combustion can lower NOx emissions remarkably, especially under a high temperature ($\geq$1600 °C) and strong reducing atmosphere (SR $\leq$ 0.8) conditions. Increasing the combustion temperature under strong reducing atmosphere conditions can raise the H atom concentration and change the radical pool composition and size, which facilitate the reduction of NO to N2. Ultimately, the increased OH/H ratio in staged O2/CO2 combustion offsets part of the reducibility, resulting in the final NOx emissions being higher than those in air combustion under the same conditions. © 2020 by the authors.
Number of references: 45
Main heading: Ammonia
Controlled terms: Selective catalytic reduction - Nitrogen oxides - Atmospheric temperature - Coal combustion - Reduction - Coal fired boilers
Uncontrolled terms: Combustion temperatures - High temperature - Hydrogen Cyanide - Low temperatures - Mechanism analysis - Reducing atmosphere - Staged combustion - Stoichiometric ratio
Classification code: 443.1 Atmospheric Properties - 451.2 Air Pollution Control - 521 Fuel Combustion and Flame Research - 524 Solid Fuels - 614.2 Steam Power Plant Equipment and Operation - 802.2 Chemical Reactions - 804.2 Inorganic Compounds
DOI: 10.3390/en13143557
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Database: Compendex
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284. A label-free yellow-emissive carbon dot-based nanosensor for sensitive and selective ratiometric detection of chromium (VI) in environmental water samples

Accession number: 20201108278636
Authors: Zhang, Shengrui (1); Jin, Lingxia (1); Liu, Jin (1); Wang, Qin (1); Jiao, Long (2)
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ISSN: 02540584
CODEN: MCHPDR
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Measurement of Cr (VI) in environmental water samples is essential for monitoring drinking water quality and the risks of industrial waste. In this study, we report the first use of a new type of label-free carbon dot-based nanosensor for ratiometric fluorescence detection of Cr (VI) in environmental water samples. By using a simple one-pot method based on the solvothermal treatment of o-phenylenediamine, bright-yellow-emissive carbon dots (Y-CDs) were synthesized, exhibiting two emission bands centered at 430 and 560 nm under a single-wavelength excitation at 345 nm. Fluorescence intensities of the two emission bands of the as-synthesized Y-CDs were found to be simultaneously Cr (VI)-sensitive. The ratio of intensity (I560 nm/I430nm) was linear against Cr (VI) concentrations from 0.01 to 4.5 μM at pH 6.0, and the detection limit (S/N = 3: 1) was 2.3 nM, therefore having a propensity to be a suitable ratiometric probe for sensing Cr (VI). Furthermore, the nanosensor was successfully applied to quantitatively detect Cr (VI) in environmental water samples. Compared with the majority of current ratiometric Cr (VI) sensors, this label-free CD-based ratiometric probe has low toxicity, a simple synthesis route, and excellent photostability. © 2020 Elsevier B.V.
Number of references: 59
Main heading: Probes
Controlled terms: Water quality - Fluorescence - Risk assessment - Carbon - Potable water - Chromium compounds - Nanosensors
Uncontrolled terms: Carbon dots - Environmental water samples - Fluorescence intensities - Label free - Ratiometric fluorescence - Ratiometric sensing - Single wavelength excitation - Solvothermal treatment
Classification code: 444 Water Resources - 445.2 Water Analysis - 741.1 Light/Optics - 761 Nanotechnology - 804 Chemical Products Generally - 914.1 Accidents and Accident Prevention - 933 Solid State Physics
Numerical data indexing: Size 3.45e-07m, Size 4.30e-07m, Size 5.60e-07m
DOI: 10.1016/j.matchemphys.2020.122912
Funding Details: Number: 2018JM2018, Acronym: -, Sponsor: -; Number: 2019.21, Acronym: -, Sponsor: -; Number: 2160313,21807068, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ006,2019JQ060, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0192, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

285. Experimental study of raining effect on the inner surface of containment roof

Accession number: 20193807449975
Authors: Tan, Bing (1); Shi, Leitai (2); Chen, R.H. (1); Tian, W.X. (1); Qiu, S.Z. (1); Su, G.H. (1)
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Language: English

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CODEN: ANENDJ
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: China Gen III NPPs is designed with PCS. When PCS starts running, the water level in IRWST may lower down due to the condensate loss on containment roof through raining, the loss of condensate will affect the effectiveness and response time of PCS. To observe the raining phenomenon and eventually evaluate heat removal capacity and response time of the PCS, a containment dome slice experimental facilities was constructed to get the lose part of the condensate. The test plate surface is 1.5 m × 0.6 m, suspended in diameter 2.5 m, high 4.5 m pressure vessel. A canon camera was set to record the images and videos of the condensation flow phenomenon through 6 viewports on the pressure vessel. Raindrop faction and flow phenomena in the presence of air under different angle were investigated under the condition of pressure ranged from 0.2 to 0.6 MPa and air concentration ranged from 14 to 69%. © 2019 Elsevier Ltd
Number of references: 22
Main heading: Drops
Controlled terms: Water levels - Roofs - Pressure vessels - Flow patterns
Uncontrolled terms: Air concentrations - Condensation flow - Experimental facilities - Heat removal capacity - Inner surfaces - Passive cooling - Raindrop fraction - Raining effect
Classification code: 619.2 Tanks - 631.1 Fluid Flow, General
Numerical data indexing: Percentage 1.40e+01% to 6.90e+01%, Pressure 2.00e+05Pa to 6.00e+05Pa, Size 2.50e+00m, Size 4.50e+00m, Size 6.00e-01m
DOI: 10.1016/j.anucene.2019.107050
Funding Details: Number: -, Acronym: MOE, Sponsor: Ministry of Education of the People's Republic of China; Number: IRT1280, Acronym: -, Sponsor: Program for Changjiang Scholars and Innovative Research Team in University;
Funding text: This work is supported by the Program for Changjiang Scholars and Innovative Research Team in University (No. IRT1280) funded by the Ministry of Education, China .
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

286. Effect of hydrocarbon structure on viscosity reduction of long chain viscoelastic surfactant

Accession number: 20202008665459
Authors: Cui, Weixiang (1, 2, 3); Yan, Jun (1); Yang, Jiang (2, 3); Wang, Yang (3); Wang, Xiaoxiang (3)
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Article number: 113197
Language: English
ISSN: 01677322
CODEN: JMLIDT
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: This paper studied the effect of different hydrocarbon structures on viscosity reduction of long-chain viscoelastic surfactant (VES) solution. The hydrocarbons studied were an alkane, cycloalkane, and aromatic hydrocarbon. The decrease of viscosity with the time of VES solution was determined at various temperatures. The study shows that aromatic hydrocarbon, benzene, and cycloalkane, cyclohexane, reduce the viscosity of VES solution faster than that of the alkane, hexane. The difference between small molecules of alkane and aromatic hydrocarbons in the viscosity reduction rate of VES solution is >100 times. The study also shows that higher temperature increases the

viscosity reduction rate of VES solution. The rate of the viscosity reduction of VES solution decreases as the molecular weight of hydrocarbon increases. © 2020
Number of references: 32
Main heading: Aromatization
Controlled terms: Surface active agents - Hexane - Paraffins - Viscosity - Mineral oils - Viscoelasticity
Uncontrolled terms: Long chains - Small molecules - Temperature increase - Viscoelastic surfactants - Viscosity reduction
Classification code: 513.3 Petroleum Products - 631.1 Fluid Flow, General - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1016/j.molliq.2020.113197
Funding Details: Number: 2016KTZDGY09-06-01, Acronym: -, Sponsor: Shaanxi Key Science and Technology Innovation Team Project; Number: -, Acronym: PetroChina, Sponsor: PetroChina Company Limited; Number: -, Acronym: SINOPEC, Sponsor: SINOPEC Petroleum Exploration and Production Research Institute;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

287. Experimental investigation of the petrophysical properties, minerals, elements and pore structures in tight sandstones

Accession number: 20200608142431
Authors: Yin, Shuai (1, 2, 3); Dong, Li (4); Yang, Xia (5); Wang, Ruyue (4)
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Corresponding author: Yin, Shuai(speedysys@163.com)
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Abbreviated source title: J. Nat. Gas Sci. Eng.
Volume: 76
Issue date: April 2020
Publication year: 2020
Article number: 103189
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Geological conditions on the eastern margin of the Ordos Basin are complex, and the amount of oil and gas exploration is low. In this paper, taking the S block in the eastern Ordos Basin as an example, we investigated the petrophysical properties, minerals, elements and pore structures of the middle Permian Shihezi Formation tight sandstones. The results show that the main lithologies of the target layer are lithic feldspar sandstone, lithic quartz sandstone, feldspar lithic sandstone and lithic sandstone. The pore types include residual intergranular pores, intergranular dissolution pores, intragranular dissolution pores, intercrystalline pores and microfractures. The porosity of the rock samples ranges between 1.4% and 19.5%, with an average of 9.95%; the permeability varies between 0.030 mD and 1.941 mD, with an average of 0.342 mD; and the water saturation is distributed between 1.0% and 69.5%, with an average of 30.7%. The water saturation of rock samples has negative correlations with porosity and permeability. Both displacement pressure (Pd) and median pressure (Pm) have good negative correlations with rock permeability. The median pore throat radius (rm) has a good positive correlation with rock permeability. Large pores with a throat radius greater than 0.1 μm are most favorable for rock permeability. The Al/(Al + Fe + Mn) values of the rock samples range from 0.67 to 0.80, indicating that the silica in the rock was not affected by hydrothermal fluid during the formation process. The Si/(Si + Al + Fe) values of the rock samples range from 0.69 to 0.78, with an average of 0.73. Si has good positive correlations with Si/Al, Al/(Al + Fe + Mn) and Si/(Si + Al + Fe). The sedimentary environment of the Shihezi Formation sandstone was characterized by fresh water, a dry-hot climate and oxidizing conditions. The

major elements correlate well with the pore structure parameters: as the debris particles or quartz grains increase, the petrophysical properties gradually improve. Finally, based on the petrophysical properties, minerals, elements and pore structure parameters, classification criteria for the pore structure of the Shihezi Formation tight sandstones in the study area are proposed. © 2020 Elsevier B.V.
Number of references: 55
Main heading: Sandstone
Controlled terms: Pore structure - Silicon - Structural properties - Petroleum prospecting - Quartz - Metamorphic rocks - Tight gas - Petroleum reservoir engineering - Porosity - Textures - Feldspar - Dissolution - Petrophysics
Uncontrolled terms: Classification criterion - Experimental investigations - Intercrystalline pores - Oil and gas exploration - Ordos Basin - Petrophysical properties - Sedimentary environment - Tight gas sandstones
Classification code: 408 Structural Design - 481.1.2 Petrology (Before 1993, use code 482) - 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 802.3 Chemical Operations - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 1.00e+00% to 6.95e+01%, Percentage 1.40e+00% to 1.95e+01%, Percentage 3.07e+01%, Size 1.00e-07m
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

288. Differential enrichment mechanism of organic matters in the marine-continental transitional shale in northeastern Ordos Basin, China: Control of sedimentary environments

Accession number: 20203909226122
Authors: Chen, Yuhang (1, 2, 3, 4); Wang, Yingbin (5); Guo, Mingqiang (5); Wu, Heyuan (1); Li, Jun (1); Wu, Weitao (1); Zhao, Jingzhou (1, 4)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Key Laboratory of Marine Geology and Environment, Institute of Oceanology, Chinese Academy of Sciences, Qingdao; 266071, China; (3) Key Laboratory of Ocean and Marginal Sea Geology, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou; 510301, China; (4) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (5) Unconventional Oil & Gas Branch, CNOOC Ltd., Beijing; 100011, China
Corresponding authors: Chen, Yuhang(cyh@xsyu.edu.cn); Zhao, Jingzhou(jzzhao@xsyu.edu.cn)
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Language: English
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Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The organic-rich shales deposited in marine-continental transitional environments are well developed in China. Previous studies mainly focused on the petrology and geochemical characteristics of the transitional shale. However, the factor controlling organic matter (OM) enrichment in the shale has not been studied adequately, limiting the optimal reservoir selection in shale gas exploration. Based on laboratory analyses and field investigations, this paper documents the geochemical features of the transitional shales in Upper Paleozoic (the Benxi, Taiyuan and Shanxi Formations) of the northeastern Ordos Basin, China. The sedimentary environment evolution and the relevant influence on OM enrichment are discussed to reveal the factor controlling the interlayer difference of the OM enrichment in the shale. The results show that the shale in the Taiyuan Formation hosts the highest OM content in the Upper Paleozoic. The sedimentary setting of the study area transited from barrier-flats to fluvial deltas, accompanied by gradually arid climates, decreasing degree of reduction and salinity of waters, and increasing clastic influx. During the middle stage of the marine-continental transition (the depositional stage of the Taiyuan Formation), the warm and

humid climate was beneficial to the OM production, and the anoxic condition was conducive to the OM preservation. In addition, the increasing clastic influx ensured the OM input, and the moderate depositional rate favored the OM preservation. All the factors above commonly established an excellent environment for the OM enrichment. Our results reveal the OM enrichment mechanism in transitional shales, which is helpful to the optimal reservoir selection in the shale gas exploration in the Ordos Basin as well as the similar basins. © 2020 Elsevier B.V.
Number of references: 103
Main heading: Biogeochemistry
Controlled terms: Metamorphic rocks - Organic compounds - Geological surveys - Sedimentology - Petroleum prospecting
Uncontrolled terms: Degree of reduction - Geochemical characteristic - Geochemical features - Organic-rich shales - Sedimentary environment - Sedimentary environment evolutions - Transitional environments - Warm and humid climates
Classification code: 481.1 Geology - 481.2 Geochemistry - 512.1.2 Petroleum Deposits : Development Operations - 801.2 Biochemistry - 804.1 Organic Compounds
DOI: 10.1016/j.jngse.2020.103625
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

289. A method of decompaction correction based on long trend of interval transit time

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Title of translation:
Authors: Lai, Shenghua (1); Cao, Jianhua (2); Zhang, Cuiping (3)
Author affiliation: (1) Xi'an Shiyou University, Xi'an; Shanxi; 710065, China; (2) Tianjin University of Science and Technology, Tianjin; 300222, China; (3) No.6 Oil Production Plant of PetroChina, Chang-qing Oilfield Company, Dingbian; Shaanxi; 718600, China
Corresponding author: Cao, Jianhua(caojh@tust.edu.cn)
Source title: Shiyou Diqiu Wuli Kantan/Oil Geophysical Prospecting
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Issue date: October 15, 2020
Publication year: 2020
Pages: 1102-1109
Language: Chinese
ISSN: 10007210
CODEN: SDWKEP
Document type: Journal article (JA)
Publisher: Science Press
Abstract: The sedimentary environment of the reservoir in Block F in the Yanchang gas field is a delta front.Due to the formation compaction, the reservoir has features of low porosity and low permeability.The contrast of interval transit time and density between the reservoir and the surrounding rock is small, which seriously affects the reliability and precision of seismic reservoir prediction.In order to reduce or partially eliminate the influence of compaction on interval transit time and increase the interval transit time contrast (velocity) between the reservoir and the surrounding rock, a method of decompaction correction with a long trend of interval transit time is proposed in the paper.Firstly,

the interval transit time are transformed after time-frequency analysis, and divided into different components in the frequency field.Taking the low-frequency component of the standard well as criteria, low-frequency long-trend correction to the interval transit time is carried out for all wells in Block F.Then new interval transit time data are formed by integrating the original high-frequency component and the corrected low-frequency part.Geophysical responses are reanalyzed using the new interval transit time.Now the reservoir is obvious with lower interval transit time, and could be distinguished clearly from the surroundings.Finally, neural network seismic velocity inversion is carried out using the corrected new interval transit time, and a high-resolution acoustic velocity inversion profile is obtained.The reservoir thickness has been accurately predicted.
Number of references: 20
Main heading: Compaction
Controlled terms: Natural gas fields - Wave propagation - Gas industry - Petroleum reservoir engineering - Acoustic wave velocity
Uncontrolled terms: High frequency components - Interval transit time - Low-frequency components - Reservoir thickness - Sedimentary environment - Seismic velocities - Time frequency analysis - Velocity inversion
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 751.1 Acoustic Waves
DOI: 10.13810/j.cnki.issn.1000-7210.2020.05.018
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

290. Hologram QSAR study on the critical micelle concentration of Gemini surfactants

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Authors: Jiao, Long (1); Wang, Yuan (1); Qu, Le (2, 3); Xue, Zhiwei (4); Ge, Yiqing (5); Liu, Huanhuan (1); Lei, Bin (1); Gao, Qian (1); Li, Mengke (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation, (Chendu University of Technology), Chendu; 610059, China; (3) Shaanxi Cooperative Innovation Center of Unconventional Oil and Gas Exploration and Development (Xi'an Shiyou University), Xi'an; 710065, China; (4) No. 203 Research Institute of Nuclear Industry, Xianyang; 712000, China; (5) Test and Environmental Testing Center of Qing'an Group Co., Ltd, Xi'an; 710077, China
Corresponding author: Jiao, Long(mop@xsyu.edu.cn)
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Abbreviated source title: Colloids Surf. A Physicochem. Eng. Asp.
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Article number: 124226
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ISSN: 09277757
E-ISSN: 18734359
CODEN: CPEAEH
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: A quantitative structure-property relationship (QSPR) study on the critical micelle concentration (CMC) of 120 Gemini surfactants was performed with hologram quantitative structure-activity relationship (HQSAR) technique. In the proposed HQSAR model, three fragment parameters, fragment distinction, fragment size and fragment length, were set to "A, B, C and D", "7–10" and "307" respectively. Two conventional validation techniques, external test set validation and leave-one-out cross-validation (LOO-CV), were utilized to evaluate the forecasting accuracy of as-proposed model. As the result, the QF32, concordance correlation coefficient, root mean squared error, r¯m2 and #r m2 of external test set validation is 0.9799, 0.9803, 0.1757, 0.9429 and 0.0100, respectively. The root mean squared error, r¯m2 and #r m2 of LOO-CV is 0.2734, 0.9296 and 0.0436, respectively. It is demonstrated that the HQSAR model built in this work is available and accurate for preliminarily studying and predicting the CMC of Gemini surfactants. Moreover, HQSAR is shown to be a promising approach for building up QSPR model in relation to the CMC of Gemini surfactants.
Number of references: 44
Main heading: Critical micelle concentration
Controlled terms: Micelles - Holograms - Mean square error

Uncontrolled terms: Critical micelle concentration (cmc) - Gemini surfactant - HQSAR - Leave-one-out cross validations - QSPR - Quantitative structure activity relationship - Quantitative structure property relationships - Root mean squared errors
Classification code: 743 Holography - 801.3 Colloid Chemistry - 922.2 Mathematical Statistics
DOI: 10.1016/j.colsurfa.2019.124226
Funding Details: Number: PLC20190702, Acronym: -, Sponsor: -; Number: 2019QNKYCXTD17, Acronym: -, Sponsor: -; Number: 21775118, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JM2018, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2019.21, Acronym: -, Sponsor: Science and Technology Innovative Research Team in Higher Educational Institutions of Hunan Province; Number: 201819061,201910705010, Acronym: -, Sponsor: National College Students Innovation and Entrepreneurship Training Program;
Funding text: This research was supported by the Open Fund of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chendu University of Technology) [No. PLC20190702], the National Natural Science Foundation of China [No. 21775118], the Natural Science Basic Research Plan in Shaanxi Province of China [No. 2018JM2018], the Youth Innovative Team Project of Higher Education of Shaanxi Province [No. 2019.21], the Youth Innovative Research Team of Xi'an Shiyou University [No. 2019QNKYCXTD17], the Shaanxi undergraduate innovation and entrepreneurship training program [No. 201819061] and the National undergraduate innovation and entrepreneurship training program [No. 201910705010].This research was supported by the Open Fund of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chendu University of Technology) [No. PLC20190702], the National Natural Science Foundation of China [No. 21775118], the Natural Science Basic Research Plan in Shaanxi Province of China [No. 2018JM2018], the Youth Innovative Team Project of Higher Education of Shaanxi Province [No. 2019.21], the Youth Innovative Research Team of Xi'an Shiyou University [No. 2019QNKYCXTD17], the Shaanxi undergraduate innovation and entrepreneurship training program [No. 201819061] and the National undergraduate innovation and entrepreneurship training program [No. 201910705010].
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

291. A Magnetic Distance Measuring System for Drilling Multiple Vertical Wells Simultaneously (*Open Access*)

Accession number: 20202708891238
Authors: Ding, Xudong (1); Gao, Xu (2)
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1550
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Issue title: 2020 4th International Workshop on Advanced Algorithms and Control Engineering, IWAACE 2020 - Mechatronics Engineering and Automation System
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Publication year: 2020
Article number: 042030
Language: English
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Document type: Conference article (CA)
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Conference date: February 21, 2020 - February 23, 2020
Conference location: Shenzhen, China
Conference code: 161276
Publisher: Institute of Physics Publishing
Abstract: With the increasing demand of oil, gas and mineral exploration and development and the development of logging technology, when drilling two or more wells, people need to carry out accurate measurement and positioning. a magnetic distance measurement system diagram for drilling multiple wells simultaneously. This paper presents a

magnetic distance measuring system for drilling multiple vertical wells simultaneously. According to the magnetic field data, the geometric relationship between the two BHAS is determined, and the distance and orientation between wells are automatically located to maintain a predetermined geometric relationship, and then simultaneous drilling is realized. The algorithm is simple, the error is within the acceptable range, and it can further improve the efficiency of drilling operation, save time and reduce cost.
Number of references: 13
Main heading: Magnetism
Controlled terms: Petroleum prospecting - Oil well logging - Infill drilling - Mineral exploration
Uncontrolled terms: Accurate measurement - Drilling operation - Exploration and development - Geometric relationships - Magnetic distances - Magnetic field data - Multiple wells - Vertical wells
Classification code: 501.1 Exploration and Prospecting Methods - 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 701.2 Magnetism: Basic Concepts and Phenomena
DOI: 10.1088/1742-6596/1550/4/042030
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

292. Grain size tailoring and enhanced energy storage properties of two-step sintered Nd3+-doped AgNbO3

Accession number: 20202408812434
Authors: Ren, Pengrong (1); Ren, Dong (1); Sun, Liang (2); Yan, Fuxue (1); Yang, Shu (1); Zhao, Gaoyang (1)
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Source title: Journal of the European Ceramic Society
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Volume: 40
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Pages: 4495-4502
Language: English
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: AgNbO3 as a lead-free antiferroelectric material, has received widespread attention in recent years due to its promising application in the aspects of energy storage devices. However, the high remnant polarization and low breakdown strength limits its energy storage properties. In this work, Nd3+-doped AgNbO3 (Ag1-3xNdxNbO3, x=0-0.015) ceramics were prepared and a two-step sintering method was employed. The introduction of Nd3+ leads to the enhanced stability of the antiferroelectric phase, refined grain size and increased resistivity. Furthermore, by adjusting the pre-heating temperature in the two-step sintering, the homogeneity of microstructure is improved and the resistance of pre-heated samples increases by one order of magnitude compared with normally sintered samples, leading to the enhanced breakdown strength. Ag0.97Nd0.01NbO3 pre-heated at 1100 °C for 2 h exhibits promising energy storage properties, with a recoverable energy storage density of 3.2 J/cm3 and energy efficiency of 52 % under an applied electric field of 210 kV/cm.
Number of references: 29
Main heading: Sintering
Controlled terms: Energy storage - Grain size and shape - Storage (materials) - Electric breakdown - Energy efficiency - Neodymium compounds - Niobium compounds - Silver compounds
Uncontrolled terms: Anti ferroelectrics - Breakdown strengths - Energy storage properties - Enhanced stability - Recoverable energy - Remnant polarizations - Two step sintering methods - Two-step sintering
Classification code: 525.2 Energy Conservation - 525.7 Energy Storage - 694.4 Storage - 701.1 Electricity: Basic Concepts and Phenomena
Numerical data indexing: Electric_Field_Strength 2.10e+07V/m, Percentage 5.20e+01%, Temperature 1.37e+03K, Time 7.20e+03s

DOI: 10.1016/j.jeurceramsoc.2020.05.076
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

293. Numerical Simulation of Fracture-flooding in Class III Oil Reservoirs

Accession number: 20203008964608
Authors: Zhi, Ji-Qiang (1); Jiang, Nan (2); Liu, Yi-Kun (1); Bai, Ming-Xing (1, 3)
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Issue title: 2nd International Conference on Advances in Civil Engineering, Energy Resources and Environment Engineering
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Language: English
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Conference name: 2020 2nd International Conference on Advances in Civil Engineering, Energy Resources and Environment Engineering, ACCESE 2020
Conference date: May 22, 2020 - May 24, 2020
Conference location: Nanning, China
Conference code: 161667
Publisher: Institute of Physics Publishing
Abstract: Daqing oilfield has entered into the stage of extra-high water cut development, and the Class I and Class II Oil Reservoirs have been successively developed and completed chemical flooding, which has a significant recovery efficiency, while the Class III Oil Reservoirs, which are primarily thin and poor reservoirs and out of surface reservoirs, are mainly developed by water flooding, with low water drive recovery. Chemical flooding and stimulation and injection are not effective to further enhance the recovery of the Class III Oil Reservoirs. In view of the special reservoir and development characteristics of the Class III Oil Reservoirs, a new concept of "Class III Oil Reservoirs fracture-flooding to enhance oil recovery" is put forward. By using numerical simulation technology, the seepage field and flooding effect of the Class III Oil Reservoirs before and after fracturing-flooding are studied to provide technical support for the development and exploration of the Class III Oil Reservoirs in Daqing oilfield. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Recovery
Controlled terms: Petroleum reservoirs - Secondary recovery - Floods - Fracture - Reservoirs (water) - Petroleum prospecting - Oil well flooding - Petroleum reservoir engineering - Numerical models - Oil field development
Uncontrolled terms: Chemical flooding - Daqing oilfields - Development characteristics - Enhance oil recoveries - Flooding effects - Recovery efficiency - Simulation technologies - Technical support

Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 921 Mathematics - 951 Materials Science
DOI: 10.1088/1755-1315/526/1/012154
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

294. Numerical simulation of proppant transport in liquid nitrogen fracturing

Accession number: 20204209352564
Authors: Wen, Haitao (1, 2); Yang, Ruiyue (1, 2); Huang, Zhongwei (1); Zheng, Yong (1); Wu, Xiaoguang (1); Hu, Xiaodong (1)
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Volume: 84
Issue date: December 2020
Publication year: 2020
Article number: 103657
Language: English
ISSN: 18755100
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Liquid nitrogen (LN) fracturing has the potential to reduce the breakdown pressure, avoid formation damage, and eliminate the water usage. However, the proppant-carrying capability of LN fracturing is still unknown since the properties of nitrogen vary significantly with the reservoir temperature and pressure. In this paper, we simulated the proppant transport during LN fracturing in a straight fracture. First, we built the proppant transport model based on a hybrid Eulerian Lagrangian Method. Then, we validated this model against published experimental data. Subsequently, we applied the model to elucidate the factors that affect the transport efficiency. Finally, suggestions for improving the proppant placement are given. The results show that the proppant-carrying capacity of nitrogen increases with the increasing migration distance during LN fracturing. Furthermore, the most effective way to improve the sand placement is reducing proppant density. The key findings can help to understand the proppant migration capacity during LN fracturing. © 2020 Elsevier B.V.
Number of references: 42
Main heading: Proppants
Controlled terms: Fracture - Liquid nitrogen - Liquefied gases - Lagrange multipliers - Reservoirs (water)
Uncontrolled terms: Breakdown pressure - Carrying capability - Eulerian-Lagrangian method - Formation damage - Migration distance - Proppant transports - Reservoir temperatures - Transport efficiency
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 804.2 Inorganic Compounds - 951 Materials Science
DOI: 10.1016/j.jngse.2020.103657
Funding Details: Number: KFJJ-TZ-2019-5, Acronym: -, Sponsor: -; Number: 51827804, Acronym: -, Sponsor: -; Number: 2019YFB1504102, Acronym: -, Sponsor: -; Number: 51725404, Acronym: -, Sponsor: National Science Fund for Distinguished Young Scholars; Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The authors would like to thank the National Key R&D Program of China (No. 2019YFB1504102), National Natural Science Foundation of China (National R&D Program for Major Research Instruments , No. 51827804), National Science Fund for Distinguished Young Scholars (No. 51725404) and Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs (No. KFJJ-TZ-2019-5) for financial support.
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Database: Compendex
Data Provider: Engineering Village

295. Fe2O3 nanotube coating micro-fiber interferometer for ammonia detection

Accession number: 20194107518110

Authors: Fu, Haiwei (1); Wang, Qiqi (1); Ding, Jijun (1); Zhu, Yi (1); Zhang, Min (1); Yang, Chong (1); Wang, Shuai (1)
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Abbreviated source title: Sens Actuators, B Chem
Volume: 303
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Publication year: 2020
Article number: 127186
Language: English
ISSN: 09254005
CODEN: SABCEB
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: This paper presents a convenient and effective method for the determination of ammonia concentration. The structure is manufactured of Fe2O3 coated tapered microfiber interferometer (MFI). The Fe2O3 nanotube coated on the MFI acts as sensing layer, which enhance the gas selectivity, adsorptivity for ammonia molecule and also enhances the evanescent field strength distribution of the sensor and changes the mode effective refractive index of guided mode in MFI. When the quantity of ammonia molecule adsorbed on the sensing layer changes, the transmission spectrum of the sensor will shift. By determining the wavelength shift of the dips of the transmission spectrum, the concentration of ammonia will be detected. The experimental results show that the tapered microfiber interferometer (MFI) sensor coated with Fe2O3 nanotube has better time response repeatability and high sensitivity in detecting ammonia gas at room temperature. The sensor has a sensitivity of 1.30 pm/ppm and can be used for the detection of harmful gas ammonia in the environment. © 2019 Elsevier B.V.
Number of references: 22
Main heading: Nanotubes
Controlled terms: Ammonia - Gas detectors - Refractive index - Gases - Electromagnetic wave reflection - Evanescent fields - Hematite - Interferometers - Molecules
Uncontrolled terms: Ammonia concentrations - Ammonia molecules - Effective refractive index - Field strength distribution - Gas sensing - Optical fiber interference - Optical fiber tapers - Transmission spectrums
Classification code: 482.2 Minerals - 701 Electricity and Magnetism - 711 Electromagnetic Waves - 741.1 Light/ Optics - 761 Nanotechnology - 804.2 Inorganic Compounds - 914.1 Accidents and Accident Prevention - 931.3 Atomic and Molecular Physics - 933.1 Crystalline Solids - 941.3 Optical Instruments - 943.3 Special Purpose Instruments
DOI: 10.1016/j.snb.2019.127186
Funding Details: Number: YCS18112032, Acronym: -, Sponsor: -; Number: 14JS073, Acronym: -, Sponsor: -; Number: 2019GY-176,2019GY–170, Acronym: -, Sponsor: -;
Funding text: This work was supported by Science and Technology Plan Program in Shaanxi Province of China (Grant Nos. 2019GY-176 and 2019GY–170), the Research Foundation of Shaanxi Educational Committee (Grant No. 14JS073), the Graduate Student Innovation Fund of Xi'an Shiyou University (Grant No. YCS18112032).This work was supported by Science and Technology Plan Program in Shaanxi Province of China (Grant Nos. 2019GY-176 and 2019GY–170), the Research Foundation of Shaanxi Educational Committee (Grant No. 14JS073), the Graduate Student Innovation Fund of Xi'an Shiyou University (Grant No. YCS18112032).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

296. EMD-Based Borehole TEM Array Signal Denoising and Baseline Wander Correction for NDT of Downhole Casings (*Open Access*)

Accession number: 20203709155832
Authors: Dang, Bo (1); Liu, Changzan (2); Yang, Ling (1); Wang, Gang (1); Wang, Mimi (1); Ren, Zhiping (1); Dang, Ruirong (1)
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Source title: IEEE Access
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Article number: 9167195
Language: English
E-ISSN: 21693536
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Transient electromagnetic (TEM) techniques have been proven to be efficient for nondestructive testing (NDT) operations due to their pulsed eddy-current properties. However, in the field of downhole measurements, harsh environments may significantly influence the NDT performance in downhole casings. In this paper, an empirical mode decomposition (EMD) method based on borehole TEM array signal denoising and baseline wander (BW) correction is proposed to compensate for the bad measurement conditions that affect downhole NDT. Based on the borehole TEM signal model, we investigated the principle of the EMD approach for the borehole TEM response, where the background magnetic noise and temperature drift effects were analyzed by considering the motion measurement and effective permeability. It was found out that although the BW can be effectively removed with the EMD approach, the performance of the signal denoising is closely related to the measurement speed of the downhole NDT sensors. To solve this problem, we proposed an array-based ensemble EMD method to improve the denoising performance of the borehole TEM signals by formulating a three-dimensional borehole TEM data structure, where the generation of the noise-aided data can be more efficient by employing the borehole TEM array. The performance of the proposed method was verified by applying it to a borehole TEM system for the NDTs of oil-well casings. In addition, field experiments were conducted, and the results demonstrated the effectiveness of the proposed method. © 2013 IEEE.
Number of references: 31
Main heading: Empirical mode decomposition
Controlled terms: Boreholes - Transient analysis - Eddy current testing - Oil field equipment - Oil wells - Eddy currents - Signal denoising
Uncontrolled terms: Downhole measurements - Effective permeability - Empirical Mode Decomposition - Measurement conditions - Motion measurements - Pulsed eddy current - Temperature drifts - Transient electromagnetics
Classification code: 511.2 Oil Field Equipment - 512.1.1 Oil Fields - 701.1 Electricity: Basic Concepts and Phenomena - 716.1 Information Theory and Signal Processing
DOI: 10.1109/ACCESS.2020.3016740
Funding Details: Number: 2018JQ5133, Acronym: -, Sponsor: -; Number: 2020KJXX-018, Acronym: -, Sponsor: -; Number: 41874158,51974250, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 17JS106, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Provincial Department of Education; Number: 2016ZX05028-001, Acronym: -, Sponsor: Science and Technology Major Project of Guangxi;
Funding text: This work was supported in part by the National Science and Technology Major Project under Grant 2016ZX05028-001, in part by the National Natural Science Foundation of China under Grant 51974250 and Grant 41874158, in part by the Youth Science and Technology Nova Project in Shaanxi Province, China, under Grant 2020KJXX-018, in part by the Natural Science Basic Research Plan in Shaanxi Province of China under Grant 2018JQ5133, and in part by the Natural Science Foundation of Shaanxi Province Department of Education under Grant 17JS106.
Compendex references: YES
Open Access type(s): All Open Access, Gold
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297. Bright-yellow-emissive carbon dots with a large Stokes shift for selective fluorescent detection of 2, 4, 6-trinitrophenol in environmental water samples

Accession number: 20200408071679
Authors: Zhang, Shengrui (1); Wang, Huajie (1); Li, Yunyun (1); Data, Fengkun Yang (1); Wang, Qin (1); Jiao, Long (2)
Author affiliation: (1) Shaanxi Key Laboratory of Catalysis, School of Chemistry and Environment Science, Shaanxi University of Technology, Hanzhong; Shaanxi; 723000, China; (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Qin(qincaimuxu009@sina.cn)
Source title: Materials Letters

Abbreviated source title: Mater Lett
Volume: 263
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Publication year: 2020
Article number: 127208
Language: English
ISSN: 0167577X
E-ISSN: 18734979
CODEN: MLETDJ
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: A fluorescent nanoprobe based on yellow-emissive carbon dots (Y-CDs) has been constructed for selective and sensitive sensing of 2,4,6-trinitrophenol (TNP). Y-CDs with a large Stokes shift (115 nm) were obtained through a simple one-pot solvothermal method. Significantly, the addition of TNP induced remarkable quenching of fluorescence intensity of Y-CDs via an inner filter effect. There was a good linear relationship between the fluorescence of Y-CDs and TNP concentration (0.2–130 μM), displaying a limit of detection of 56 nM. The nanoprobe can selectively detect TNP without interference from other nitroaromatic explosives, and has been successfully used for determining TNP in environmental water samples, representing a convenient tool for TNP sensing in environmental samples. © 2019 Elsevier B.V.
Number of references: 13
Main heading: Nanoprobes
Controlled terms: Aromatic compounds - Explosives detection - Quenching - Fluorescence - Carbon
Uncontrolled terms: Carbon material - Environmental sample - Environmental water samples - Fluorescent detection - Inner filter effects - Linear relationships - Nitroaromatic explosives - Quenching of fluorescence
Classification code: 537.1 Heat Treatment Processes - 741.1 Light/Optics - 741.3 Optical Devices and Systems - 761 Nanotechnology - 801 Chemistry - 804 Chemical Products Generally - 804.1 Organic Compounds - 933 Solid State Physics
Numerical data indexing: Size 1.15e-07m
DOI: 10.1016/j.matlet.2019.127208
Funding Details: Number: S201910720049, Acronym: -, Sponsor: National College Students Innovation and Entrepreneurship Training Program; Number: 2018JM2018, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0192, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department; Number: 21807068, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The authors acknowledge the financial support by the National Natural Science Foundation of China (No. 21807068 , 21775118), the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2018JM2018), the Scientific Research Plan Projects of Shaanxi Education Department of China (19JK0192), Projects of Innovation and Entrepreneurship Training Program for College Students in Shaanxi Province (S201910720049). Appendix A
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

298. Numerical simulation of hydraulic fracturing of hot dry rock under thermal stress

Accession number: 20204109322512
Authors: Guo, Tiankui (1); Tang, Songjun (1); Liu, Shun (2); Liu, Xiaoqiang (1); Zhang, Wei (3); Qu, Guanzheng (2)
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Corresponding author: Guo, Tiankui(guotiankui@126.com)
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Publication year: 2020
Article number: 107350
Language: English
ISSN: 00137944
CODEN: EFMEAH
Document type: Journal article (JA)

Publisher: Elsevier Ltd
Abstract: The hot dry rock (HDR) hydraulic fracturing is a complex physical process coupling the effects of seepage, stress, temperature, and damage. The high temperature and brittleness of the HDR leads to the great thermal stress, and the rock is possibly thermally damaged, thus promoting hydraulic fracture (HF) extension and significantly improving the permeability around the HF. In this paper, a thermo-hydro-mechanical-damage (THMD) coupling model is established based on elastic thermodynamics, Biot's classic seepage mechanics and mesoscopic damage mechanics, and its accuracy is evaluated through case study and verification with theoretical models and experiments. The evolution of multi-physics during hydraulic fracturing of HDR is studied, and the effects of rock thermophysical parameters, temperature difference, rock heterogeneity, Young's modulus, permeability, and injection rate on HF extension in the HDR are investigated. The results show that initially, due to the severe temperature variation near the borehole, the higher thermal expansion coefficient leads to the greater thermal tensile stress and facilitates rock damage, thus reducing the fracture pressure. The research results provide theoretical basis and technical support for fracturing design of geothermal system. © 2020 Elsevier Ltd
Number of references: 42
Main heading: Thermal stress
Controlled terms: Fracture mechanics - Hydraulic fracturing - Temperature - Fracture - Geothermal fields - Thermal expansion - Rocks - Elastic moduli - Seepage - Numerical models
Uncontrolled terms: Complex physical process - Mesoscopic damage mechanics - Rock heterogeneity - Temperature differences - Temperature variation - Thermal expansion coefficients - Thermal tensile stress - Thermo-physical parameters
Classification code: 481.3.1 Geothermal Phenomena - 512.1.2 Petroleum Deposits : Development Operations - 615.1 Geothermal Energy - 641.1 Thermodynamics - 921 Mathematics - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.engfracmech.2020.107350
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Funding text: The authors would like to acknowledge the financial support of the National Natural Science Foundation of China (Grant No. 51874338), and express their gratitude to project ZR2019QEE005 supported by Shandong Provincial Natural Science Foundation and the project supported by the Shaanxi Provincial Education Department 's Scientific Research Program (18JK0611).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

299. Improved thermal and mechanical properties of bismaleimide nanocomposites: Via incorporation of a new allylated siloxane graphene oxide (*Open Access*)

Accession number: 20204309391886
Authors: Jiang, Hao (1); Li, Zhao (1); Gan, Jiantuo (1); Wang, Lei (1); Li, Yan (1)
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Corresponding author: Jiang, Hao(hjiang@xsyu.edu.cn)
Source title: RSC Advances
Abbreviated source title: RSC Adv.
Volume: 10
Issue: 60
Issue date: October 6, 2020
Publication year: 2020
Pages: 36853-36861
Language: English
E-ISSN: 20462069
CODEN: RSCACL
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: A thermosetting resin system based on bismaleimide (BMI) has been developed via copolymerization with 4,4-diaminodiphenylsulfone in the presence of a newly synthesized graphene oxide, modified using allylated siloxane (AS-GO). The curing behavior of the AS-GO-containing resin system was evaluated using curing kinetics. The dispersibility of AS-GO in the resin was observed through polarizing optical microscopy (POM), which indicates that AS-GO has good dispersibility in the resin due to GO modified with allylated siloxane which has a good phase

compatibility with BMI. The effect of AS-GO on the thermomechanical and mechanical properties of the cured modified resin was also studied. Results of thermogravimetric analysis indicated that the cured sample systems display a high char yield at lower concentrations of AS-GO (≤ 0.5 wt%) with an improved thermal stability. Using dynamic mechanical analysis, a marked increase in glass transition temperature (Tg) with increasing AS-GO content was observed. Mechanical property analyses revealed a possible effect of AS-GO as a toughener, and the results showed that an addition of 0.3% AS-GO maximized the toughness of the modified resin systems, which was confirmed by analysis of fracture surfaces. © The Royal Society of Chemistry.
Number of references: 45
Main heading: Resins
Controlled terms: Dynamic mechanical analysis - Curing - Glass transition - Thermogravimetric analysis - Graphene - Toughness
Uncontrolled terms: Diaminodiphenylsulfone - Dispersibilities - Fracture surfaces - Phase compatibility - Polarizing optical microscopy - Thermal and mechanical properties - Thermo-mechanical - Thermosetting resin systems
Classification code: 761 Nanotechnology - 801 Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804 Chemical Products Generally - 815.1.1 Organic Polymers - 951 Materials Science
DOI: 10.1039/d0ra06621d
Funding Details: Number: 2019JQ-286, Acronym: -, Sponsor: -; Number: ys37020203, Acronym: -, Sponsor: -; Number: 19JK0660, Acronym: -, Sponsor: -; Number: 51702257, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Young Scientists Fund;
Funding text: The authors wish to thank for nancial support from the Provincial Superiority Discipline of Materials Science and Engineering of Xi'an Shiyou University (ys37020203). Research fundings from the Young Scientists Fund of the National Natural Science Foundation of China (Grant No. 51702257); the National Science Foundation of Shaanxi Province (No. 2019JQ-286) and Scientic Research Program of Shaanxi Education Department (No. 19JK0660) are greatly acknowledged by the authors.
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

300. Difference in perforation rates of jetting tool nozzles and influencing factors

Accession number: 20202208709840
Authors: Cheng, Jiarui (1); Dou, Yihua (2); Zhang, Ningsheng (3); Li, Zhen (2); Cui, Lu (2)
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Corresponding author: Cheng, Jiarui(cjr88112@163.com)
Source title: International Journal of Oil, Gas and Coal Technology
Abbreviated source title: Int. J. Oil Gas Coal Technol.
Volume: 24
Issue: 1
Issue date: 2020
Publication year: 2020
Pages: 102-127
Language: English
ISSN: 17533309
E-ISSN: 17533317
Document type: Journal article (JA)
Publisher: Inderscience Publishers
Abstract: Variations in the rates of hydraulic perforation among different jetting nozzles are common in gas well development, especially the multi-stage perforation of horizontal wells. A laboratory experiment was conducted to analyse the effects of flow rate, liquid viscosity and particle size on the perforation rate of a multi-nozzle structure under liquid-solid flow. The spatial distributions of particles and sample erosion rates were documented for multi-stage multi-angle nozzles with a variable difference in liquid properties and flow parameters using three particle sizes. Results showed that the difference in perforation rates among the nozzles was affected by the particle distribution inside the jetting tool and the energy of the particles ejected by each nozzle. Furthermore, the difference in perforation rates of nozzles with different jet angles was markedly affected by particle size, then by the flow rate and finally the liquid viscosity. © 2020 Inderscience Enterprises Ltd.
Number of references: 19

Main heading: Particle size
Controlled terms: Liquids - Horizontal wells - Nozzles - Particle size analysis - Well perforation - Erosion - Viscosity of liquids
Uncontrolled terms: Flow parameters - Laboratory experiments - Liquid properties - Liquid viscosity - Liquid-solid flow - Nozzle structure - Particle distributions - Variable differences
Classification code: 512.1.1 Oil Fields - 631.1 Fluid Flow, General - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1504/IJOGCT.2020.106702
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

301. Influence of FSI on the Natural Frequencies and Mode Shapes of Tubing (*Open Access*)

Accession number: 20202908936291
Authors: Liu, Hongtao (1); Zhang, Wei (1); Cao, Yinping (2); Dou, Yihua (2)
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Corresponding author: Cao, Yinping(caoyinping029@163.com)
Source title: IOP Conference Series: Earth and Environmental Science
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Issue: 2
Issue title: 4th International Symposium on Resource Exploration and Environmental Science - 1. Resource Exploration and Utilization, Geography and Geological Engineering
Issue date: July 2, 2020
Publication year: 2020
Article number: 022018
Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 4th International Symposium on Resource Exploration and Environmental Science, REES 2020
Conference date: April 25, 2020 - April 26, 2020
Conference location: Ordos, China
Conference code: 161594
Publisher: IOP Publishing Ltd
Abstract: Numerical simulation method was adopted to analyze the influence of fluid-solid interaction (FSI) on the vibration characteristics of tubing. The natural frequencies and mode shapes of tubing were analyzed for the cases of no FSI, gas-solid interaction, and liquid-solid interaction in the modal module of ANSYS Workbench software. It shows that natural frequencies of tubing decreased when considering FSI. The decrease is greatest for the case of liquid-solid interaction, which is more than 13% compared with gas-solid interaction. The mode shapes are almost unchanged even considering FSI. The results show that the effect of FSI can not be ignored, especially when the internal fluid density is large. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Natural frequencies
Controlled terms: Tubing - Numerical methods - Vibration analysis
Uncontrolled terms: Ansys workbenches - Gas solid interaction - Influence of fluid - Internal fluid - Liquid-solid interaction - Natural frequencies and modes - Numerical simulation method - Vibration characteristics
Classification code: 619.1 Pipe, Piping and Pipelines - 921.6 Numerical Methods
Numerical data indexing: Percentage 1.30e+01%
DOI: 10.1088/1755-1315/514/2/022018
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Funding text: This work was financially supported by National Science and Technology Major Project fund (No. 2016ZX05051-19).
Compendex references: YES

Open Access type(s): All Open Access, Bronze
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302. Characterization of Ni2P/Fe-HAP catalyst and its surface interaction mechanism of phenol hydrogenation

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Title of translation: Ni2P/Fe-HAP
Authors: Xu, Haisheng (1); He, Lijuan (1); Huang, Guoqiang (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Source title: Jingxi Huagong/Fine Chemicals
Abbreviated source title: Jingxi Huagong
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Publication year: 2020
Pages: 1227-1232
Language: Chinese
ISSN: 10035214
CODEN: JIHUFJ
Document type: Journal article (JA)
Publisher: Fine Chemicals
Abstract: Fe-HAP carrier was synthesized by ion exchange method using low-grade hydroxyapatite (HAP) as raw material. Then, Ni2P/HAP and Ni2P/Fe-HAP supported catalysts were prepared by impregnation method. The catalysts were characterized by BET, SEM, XRD, FTIR and TG. The results showed that the introduction of Fe3+ greatly increased the specific surface area of the carrier, and Ni2P was dispersed on the surface of Fe-HAP with good thermal stability. The catalytic properties of Ni2P/HAP and Ni2P/Fe-HAP catalysts for the hydrogenation of phenol to cyclohexanone were compared under the conditions of reaction temperature of 150, reaction pressure of 0.5 MPa, and reaction time of 3.5 h. It was found that Ni2P/Fe-HAP catalyst had relatively good catalytic property, the conversion of phenol was 65.73%, and the selectivity of cyclohexanone was 85.47%. © 2020, Editorial Office of FINE CHEMICALS. All right reserved.
Number of references: 32
Main heading: Phenols
Controlled terms: Iron compounds - Catalyst selectivity - Nickel compounds - Hydrogenation - Ion exchange - Hydroxyapatite
Uncontrolled terms: Catalytic properties - Hydroxyapatite (HAp) - Impregnation methods - Ion-exchange methods - Phenol hydrogenation - Reaction pressure - Reaction temperature - Surface interactions
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 6.57e+01%, Percentage 8.55e+01%, Pressure 5.00e+05Pa, Time 1.26e+04s
DOI: 10.13550/j.jxhg.20191183
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

303. Productivity Evaluation of Vertical Wells Incorporating Fracture Closure and Reservoir Pressure Drop in Fractured Reservoirs (*Open Access*)

Accession number: 20200708169168
Authors: Zhao, Lun (1); Fan, Zifei (1); Wang, Mingxian (1, 2); Xing, Guoqiang (1); Zhao, Wenqi (1); Tan, Chengqian (2); Cheng, Youyou (3)
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Corresponding author: Wang, Mingxian(wangmingxian89@126.com)
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Article number: 9356178
Language: English
ISSN: 1024123X
E-ISSN: 15635147
Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: In most oilfields, many wells produce in pseudo-steady-state period for a long time. Because of large reservoir pressure drop in this period, fractured reservoirs always show strong stress sensitivity and fracture closure is likely to occur near wellbores. The primary goal of this study is to evaluate productivity of vertical wells incorporating fracture closure and reservoir pressure drop. Firstly, a new composite model was developed to deal with stress sensitivity and fracture closure existed in fractured reservoirs. Secondly, considering reservoir saturation condition, new pseudo-steady productivity equations for vertical wells were derived by using the proposed composite system. Thirdly, related inflow performance characteristics and influence of some factors on them were also discussed in detail. Results show that fracture closure has a great effect on vertical well inflow performance and fracture closure radius is negatively correlated with well productivity. In this composite model, the effects of stress sensitivity of the inner and outer zone on well productivity are rather different. The inner zone's stress sensitivity affects well productivity significantly, but the outer zone's stress sensitivity just has a weak effect on the productivity. Strong stress sensitivity in the inner zone leads to low well productivity, and both inflow performance and productivity index curves bend closer to the bottom-hole pressure axis with stress sensitivity intensifying. Meanwhile, both maximum productivity and optimal bottom-hole pressure can be achieved from inflow performance curves. In addition, reservoir pressure is positively correlated with vertical well productivity. These new productivity equations and inflow performance curves can directly provide quantitative reference for optimizing production system in fractured reservoirs. © 2020 Lun Zhao et al.
Number of references: 26
Main heading: Pressure drop
Controlled terms: Boreholes - Productivity - Bottom hole pressure - Drops - Oil wells - Fracture
Uncontrolled terms: Fractured reservoir - Inflow performance - Maximum productivity - Productivity equation - Productivity evaluation - Pseudo steady state - Reservoir pressures - Saturation conditions
Classification code: 512 Petroleum and Related Deposits - 512.1.1 Oil Fields - 951 Materials Science
DOI: 10.1155/2020/9356178
Compendex references: YES
Open Access type(s): All Open Access, Bronze, Green
Database: Compendex
Data Provider: Engineering Village

304. Relationship between aromatic component types and maturity in crude oil inclusions:a case study of Fuyu reservoir in Sanzhao sag

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Title of translation: -
Authors: Si, Shanghua (1, 2); Zhao, Jingzhou (1, 2); Zou, Guoliang (3); Li, Jun (1, 2); Meng, Xiangning (1, 2); Liu, Chao (1, 2)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (3) Exploration Department, PetroChina Changqing Oilfield Company, Xi'an; Shaanxi; 710018, China
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Publication year: 2020
Pages: 835-840 and 864
Language: Chinese
ISSN: 02532697
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Document type: Journal article (JA)
Publisher: Science Press
Abstract: Based on the fluorescence of crude oil, using the fluorescence spectroscopic method of nondestructive analysis of the components of single fluid inclusion, this paper quantitatively describes the fluorescence spectrum of oil inclusions in the Fuyu reservoir, Sanzhao sag, Songliao Basin, so as to clarify the relationship between the aromatic constituents in oil inclusions and the maturity of crude oil. First, this study obtains the types of fluorescence color of oil inclusions in the reservoirs, and also the fluorescence spectrum of a single oil inclusion. Then, a comparison is made on the characteristic value for the main peak wavelength of the fluorescence spectrum of the standard aromatic hydrocarbon under the excitation of monochromatic light at the wavelength of 365 nm. Finally, this paper divides the hydrocarbon charging episodes and the types of aromatic constituents of oil inclusions in different episodes. The research results show that the Fuyu reservoir has oil inclusions with four fluorescent colors, i.e., yellow, yellow-green, blue-green and blue, representing the charging of hydrocarbons with different maturity. Among them, the #max of the yellow fluorescent oil inclusions in episode is 576.0-584.5 nm, which represents low-mature oil filling; the #max of the yellow-green fluorescent oil inclusions in episode is 528.7-546.3 nm, representing medium-mature oil filling; the #max of the blue-green fluorescent oil inclusions in episode is 491.6-516.1 nm, representing medium-mature oil filling; the #max of the blue-fluorescent oil inclusions in episode is 440.6-456.5 nm, representing high-mature oil charging. Through comprehensive judgment, the Fuyu reservoir in Sanzhao sag experienced four episodes of hydrocarbon charging during the geological history. The aromatic constituents in oil inclusions are mainly decacyclic aromatic hydrocarbons and naphthacene, followed by rubrene, containing a small amount of cholanthrene and anthracene; the oil inclusions in the reservoirs are generally characterized by less aromatic hydrocarbons with small molecular weight and more aromatic hydrocarbons with large molecular weight, indicating the crude oil in oil inclusions are dominated by low-medium mature crude oil. By formulating the relationship between the fluorescence spectrum characteristics of oil inclusions and aromatic constituents, this paper provides a basis for studying the types and maturity of aromatic constituents in crude oil.
Number of references: 20
Main heading: Fluorescence
Controlled terms: Crude oil - Mineral oils - Aromatic hydrocarbons - Filling - Petroleum reservoir engineering - Color - Spectroscopic analysis - Aromatization - Molecular weight
Uncontrolled terms: Aromatic components - Characteristic value - Fluorescence spectra - Fluorescent colors - Geological history - Monochromatic light - Non-destructive analysis - Spectroscopic method
Classification code: 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 513.3 Petroleum Products - 691.2 Materials Handling Methods - 741.1 Light/Optics - 801 Chemistry - 802.2 Chemical Reactions - 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics
Numerical data indexing: Size 3.65e-07m, Size 4.41e-07m to 4.57e-07m, Size 4.92e-07m to 5.16e-07m, Size 5.29e-07m to 5.46e-07m, Size 5.76e-07m to 5.85e-07m
DOI: 10.7623/syxb202007005
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

305. Analysis of the Performance Improvement Effect of Combined Packing for Oil and Gas Well Packer (*Open Access*)

Accession number: 20202908936290
Authors: Liu, Huifeng (1); Zhang, Wei (1); Cao, Yinping (2); Dou, Yihua (2)
Author affiliation: (1) PetroChina Tarim Oilfield Company, Korla Xinjiang, China; (2) Xi'an Shiyou University, Shaanxi Xi'an, China
Corresponding author: Cao, Yinping(caoyinping029@163.com)
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Issue title: 4th International Symposium on Resource Exploration and Environmental Science - 1. Resource Exploration and Utilization, Geography and Geological Engineering
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Language: English

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Conference name: 4th International Symposium on Resource Exploration and Environmental Science, REES 2020
Conference date: April 25, 2020 - April 26, 2020
Conference location: Ordos, China
Conference code: 161594
Publisher: IOP Publishing Ltd
Abstract: Packer is a commonly used downhole tool for oil and gas wells. In order to understand the working performance of combined packing, a finite element analysis is performed on the double expansion-compression-expansion combined seal packers to find the effect of combined seal. Taking packers sealed in casing with a diameter of 114.3mm and a wall thickness of 12.7mm as an example, finite element models are established for double expansion and expansion-compression combined seal packers respectively. By applying packer-setting pressure to the finite element models and processing the strain-stress data resulting from finite element analyses, the distribution rules of packing stress and contact pressure between the packing and the inner casing wall for different combined seal packers are obtained. The working performance of the single expansion seal packer and the double expansion and expansion-compression combined seal packers is compared and analyzed. According to the results of finite element analyses, both double expansion combined seal and expansion-compression combined packings can be in effective contact with the casing under a packer-setting pressure of 15MPa, and the contact pressure between the combined seal packing and the inner casing wall is larger than that of a single seal packing. The combined seal packer therefore can actually improve the sealing and packoff effect of the packer. The expansion-compression combined seal has the highest pressure bearing capacity, which is 50% higher than that of the single expansion packer. The lower packing of the double expansion combined packer and the expansion packing of the expansion-compression combined seal packers should be appropriately strengthened and thickened to improve the packing performance of the combined seal packer. The results of contrastive analysis reveal the improvement effect of the sealing and packoff performance of the combined seal packers, which can be used as a reference for the improved design of such packer. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 13
Main heading: Expansion
Controlled terms: Finite element method - Natural gas wells - Packers
Uncontrolled terms: Compression-expansion - Contact pressures - Contrastive analysis - Distribution rule - Effective contact - Oil and gas well - Pressure bearing capacity - Working performance
Classification code: 511.2 Oil Field Equipment - 512.2.1 Natural Gas Fields - 921.6 Numerical Methods - 951 Materials Science
Numerical data indexing: Percentage 5.00e+01%, Pressure 1.50e+07Pa, Size 1.14e-01m, Size 1.27e-02m
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Open Access type(s): All Open Access, Bronze
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306. A Novel Optical Fiber Mach-Zehnder Interferometer Based on the Calcium Alginate Hydrogel Film for Humidity Sensing

Accession number: 20202108704114
Authors: Bian, Ce (1); Cheng, Yufei (1); Zhu, Wenhua (1); Tong, Rongxin (1); Hu, Manli (1); Gang, Tingting (2)
Author affiliation: (1) School of Physics, Northwest University, Xi'an, China; (2) College of Science, Xi'An Shiyou University, Xi'an, China
Corresponding author: Hu, Manli(huml@nwu.edu.cn)
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Article number: 8994085
Language: English
ISSN: 1530437X
E-ISSN: 15581748
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: A novel optical fiber humidity sensor based on a Mach-Zehnder Interferometer (MZI) is proposed and experimentally demonstrated. The MZI is fabricated by three sections of single mode fiber (SMF) and two sections of multimode fiber (MMF), where the two MMFs are spliced among the three SMFs. To obtain an excellent sensor, two sections of MMF are etched with hydrofluoric acid, then sodium alginate is coated on the corroded areas and immersed in calcium chloride solution to form calcium alginate (CaAlg) hydrogel by fully crosslinking sodium alginate with calcium ions. While humidity is between 15%80%, the sensitivity of the sensor can reach 0.48346 dB/%RH. In addition, the proposed sensor shows good performances in the repeatability, stability, response and recovery time, which can be potentially used in the medical storage field. © 2001-2012 IEEE.
Number of references: 16
Main heading: Humidity sensors
Controlled terms: Multimode fibers - Sodium alginate - Calcium chloride - Hydrogels - Mach-Zehnder interferometers - Optical fiber fabrication - Single mode fibers - pH sensors - Sodium
Uncontrolled terms: Calcium alginate - Chloride solutions - Fiber Mach-Zehnder interferometers - Humidity sensing - Machzehnder interferometers (MZI) - Multi-mode fibers (MMF) - Response and recovery time - Storage fields
Classification code: 443.2 Meteorological Instrumentation - 549.1 Alkali Metals - 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 801.1 Chemistry, General - 801.3 Colloid Chemistry - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 941.3 Optical Instruments - 943.3 Special Purpose Instruments
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

307. A high resolution and large range fiber Bragg grating temperature sensor with vortex beams

Accession number: 20204209358131
Authors: Fu, Haiwei (1, 2); Wang, Shuai (1, 2); Chang, Huimin (1, 2); You, Yongtao (1, 2)
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Corresponding author: Fu, Haiwei(hwfu@xsyu.edu.cn)
Source title: Optical Fiber Technology
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Issue date: December 2020
Publication year: 2020
Article number: 102369
Language: English
ISSN: 10685200
CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: The vortex beam owns helical phase factor, orbital angular momentum, and hollow structure of intensity distribution. It is widely applied in information coding, optical manipulation and optical sensing. This paper attempts to

design a fiber Bragg temperature sensor based on vortex light, including an orbital angular momentum (OAM) beam transmitted by fiber Bragg grating (FBG), an optical fiber path used to eliminate errors, and a Gaussian beam, which is used to interfere with FBG transmission light. The interference pattern of a Gaussian beam and an OAM beam rotates with the changes of phase difference between the two beams. When the temperature changes, FBG is affected by the thermal optical effect and thermal expansion effect, and the central wavelength of the reflected spectrum will shift. Based on the relationship between wavelength shift and temperature change, temperature measurement in a large range can be realized. Additionally, the Filter is placed behind the FBG, and the transmission light (#=1.466m) with less reflection is selected to interfere with the Gaussian light, with the change of phase of transmission light, the rotation of the interference pattern will change accordingly. The temperature change corresponding to the 2 rotation of the interference pattern can be obtained, thus temperature measurement with high resolution can be realized. The simulation results show that when the temperature range is 27 °C427 °C, the sensitivity of this sensor is 14.42 pm/°C. On the basis of the rotation of the interference pattern, when the rotation angle of the temperature-induced interference pattern change within 2 the temperature sensitivity is 1.529 rad/°C, based on the angular resolution of CCD, the theoretical resolution of temperature measurement is 6.3e7 °C. Similar to the cursor effect, the main ruler measures a wide range of temperature changes according to wavelength drift, and the cursor is a high-resolution measurement of temperature according to the rotation angle of the interference pattern. © 2020 Elsevier Inc.
Number of references: 21
Main heading: Fiber Bragg gratings
Controlled terms: Angular distribution - Gaussian beams - Light transmission - Vortex flow - Single mode fibers - Fiber optic sensors - Gaussian distribution - Angular momentum - Temperature measurement - Thermal expansion
Uncontrolled terms: Fiber bragg temperature sensors - High-resolution measurements - Intensity distribution - Interference patterns - Orbital angular momentum - Temperature sensitivity - Thermal expansion effect - Thermal-optical effect
Classification code: 631.1 Fluid Flow, General - 641.1 Thermodynamics - 711 Electromagnetic Waves - 741.1 Light/Optics - 741.1.2 Fiber Optics - 922.1 Probability Theory - 922.2 Mathematical Statistics - 944.6 Temperature Measurements - 951 Materials Science
DOI: 10.1016/j.yofte.2020.102369
Funding Details: Number: 14JS073,12JS077, Acronym: -, Sponsor: -; Number: YCS18212057, Acronym: -, Sponsor: -; Number: 41474108, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019GY-176,2019GY-170, Acronym: -, Sponsor: -;
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), the Science and Technology Plan Programin Shaanxi Province of China (Grant Nos. 2019GY-176 and 2019GY-170), and the Innovative and Practical Ability Training Program for Postgraduates of Xi'an Shiyou University (YCS18212057).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

308. Research on Pipeline Robots with Obstacle Crossing and Turning Ability (*Open Access*)

Accession number: 20203108984329
Authors: Wei, Hangxin (1); Cheng, Panghu (1); Wang, Xiaorong (2); Song, Xinai (3)
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Corresponding author: Wei, Hangxin(weihangxin@xsyu.edu.cn)
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Issue title: 2020 International Conference on Petrochemical Engineering and Green Development
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Article number: 012005
Language: English
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Conference name: 2020 International Conference on Petrochemical Engineering and Green Development, ICPEGD 2020
Conference date: April 17, 2020 - April 19, 2020
Conference location: Shanghai, China
Conference code: 161664
Publisher: Institute of Physics Publishing
Abstract: The pipeline robot will encounter complex conditions of turning, obstacles and pipe diameter changes when it works. Therefore, cornering performance, obstacle crossing performance, and diameter changing ability are important indicators of the pipeline robot performance. A multi-axis differential adaptive pipeline robot is designed. The multi-axis differential mechanism is used to realize the smooth turning of the robot. The pre-tightening and reducing mechanism is used to achieve the obstacle crossing of the robot and the ability to adapt to different pipe diameters. The overall structure of the pipeline robot, the transmission mechanism, and the pre-tightening and reducing mechanism are introduced. The kinematics model of the robot is studied when it crosses obstacles. Using the maximum height of the pipeline robot passing through obstacles as an indicator, an equation of the pipeline robot obstacle crossing is established. The ADAMS software is used to simulate the kinematics of the turning process of the pipeline robot. Through the simulation experiments, the following conclusions are obtained: (1) The larger the adhesion coefficient between the pipe wall and the wheel, the stronger the obstacle crossing ability of the pipeline robot. The larger the diameter of the wheel, the stronger the ability to overcome obstacles. (2) By tracking the changes in the angular velocity of the three driving wheels, it is shown that the pipeline robot can pass through the curve smoothly and has anti-motion interference performance. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 15
Main heading: Robots
Controlled terms: Turning - Pipelines - Wheels - Kinematics
Uncontrolled terms: ADAMS software - Adhesion coefficient - Encounter complex - Kinematics modeling - Obstacle crossings - Pipeline robot - Transmission mechanisms - Turning process
Classification code: 601.2 Machine Components - 604.2 Machining Operations - 619.1 Pipe, Piping and Pipelines - 731.5 Robotics - 931.1 Mechanics
DOI: 10.1088/1755-1315/513/1/012005
Funding Details: Number: 2019KW-080, Acronym: -, Sponsor: -; Number: 2019JM-174, Acronym: -, Sponsor: -;
Funding text: Acknowledgments. The project was supported by the Scientific Research Project of Shanxi Province, China (2019JM-174) and by the International Science and Technology Cooperation and Exchange Project of Shaanxi Province (2019KW-080). The authors wanted to give their gratitude to them.
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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309. Investigation on the thermal-hydraulic performance in a PCHE with airfoil fins for supercritical LNG near the pseudo-critical temperature under the rolling condition

Accession number: 20201908614220
Authors: Tang, Linghong (1); Cao, Zhen (2); Pan, Jie (3)
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Corresponding author: Pan, Jie(jackpan@xsyu.edu.cn)
Source title: Applied Thermal Engineering
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Article number: 115404
Language: English
ISSN: 13594311
CODEN: ATENFT
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In this study, thermal and hydraulic performance of supercritical liquefied natural gas (LNG) is numerically studied in a printed circuit heat exchanger (PCHE) with airfoil fins under a rolling condition. Effects of operating

pressures and rolling parameters are investigated. Results indicate that the PCHE has better thermal performance but worse hydraulic performance at a lower pressure condition. The instantaneous Nusselt numbers and the instantaneous Darcy friction factors present quasi-sine patterns against time, with a period same as the rolling period. The rolling condition gives larger time-averaged Nusselt numbers and Darcy friction factors, compared with the static condition, and the thermal and hydraulic performance increases with increasing rolling amplitude and rolling frequency. However, the rolling amplitude has a prevailing effect on the performance, in comparison to the rolling frequency. © 2020 Elsevier Ltd
Number of references: 38
Main heading: Liquefied natural gas
Controlled terms: Airfoils - Temperature - Friction - Printed circuits - Timing circuits - Nusselt number - Fins (heat exchange)
Uncontrolled terms: Darcy friction factor - Hydraulic performance - Liquefied Natural Gas (LNG) - Printed circuit heat exchangers - Pseudo-critical temperature - Thermal and hydraulic performance - Thermal Performance - Thermal-hydraulic performance
Classification code: 523 Liquid Fuels - 616.1 Heat Exchange Equipment and Components - 641.1 Thermodynamics - 641.2 Heat Transfer - 652.1 Aircraft, General - 713.4 Pulse Circuits
DOI: 10.1016/j.applthermaleng.2020.115404
Funding Details: Number: 2020JM-539, Acronym: -, Sponsor: -; Number: 51774237, Acronym: -, Sponsor: -;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

310. Characteristics and life expression of fatigue fracture of G105 and S135 drill pipe steels for API grade

Accession number: 20202808924180
Authors: Luo, Sheji (1); Liu, Ming (2); Zheng, Xinxia (3)
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Source title: Engineering Failure Analysis
Abbreviated source title: Eng. Fail. Anal.
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Issue date: October 2020
Publication year: 2020
Article number: 104705
Language: English
ISSN: 13506307
CODEN: EFANEM
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Characteristics and life expression of fatigue fracture of drill pipe steels for API G105 and S135 grade were investigated experimentally. S135 steel with higher tensile strength has higher fatigue strength and fatigue limit than that of G105 steel with lower tensile strength. A modified model for the S-N data, revealing the correlation between the fatigue life and fatigue limit, equivalent stress amplitude reflecting the effect of stress ratio, is suggested for predicting the fatigue damage. The fatigue limit and the fatigue strength coefficient are correlated to the tensile properties. The mechanism of the fatigue fracture was examined by scanning electron microscopy. © 2020 Elsevier Ltd
Number of references: 32
Main heading: Fatigue of materials
Controlled terms: Drill pipe - Infill drilling - Tensile strength - Drills - Scanning electron microscopy - Steel pipe - Fracture
Uncontrolled terms: Drill pipe steels - Effect of stress - Equivalent stress - Fatigue fracture - Fatigue Limit - Fatigue strength - G105 steel - Modified model
Classification code: 511.1 Oil Field Production Operations - 511.2 Oil Field Equipment - 545.3 Steel - 603.2 Machine Tool Accessories - 619.1 Pipe, Piping and Pipelines - 951 Materials Science
DOI: 10.1016/j.engfailanal.2020.104705

Funding Details: Number: 20190086, Acronym: -, Sponsor: -; Number: 51801149,SV2019-KF-10, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 202008610049, Acronym: CSC, Sponsor: China Scholarship Council; Number: 2019YFF0217500,2019YFF0217502, Acronym: NKRDPC, Sponsor: National Key Research and Development Program of China;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 51801149), the Fund of State Key Laboratory for Strength and Vibration of Mechanical Structures (No. SV2019-KF-10), the National Key Research and Development Program of China (No. 2019YFF0217500 , 2019YFF0217502), the International Postdoctoral Exchange Fellowship program 2019 by the Office of China Postdoctoral Council (No. 20190086) and the China Scholarship Council (No. 202008610049).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

311. Design and Implementation of Technical Indicators Analysis System for Drilling Based on Microservices

Accession number: 20211910326812
Authors: Chen, Xiaoyu (1); Wang, Kuisheng (1); Su, Xinghua (2); Zhan, Sheng (2)
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Corresponding author: Wang, Kuisheng(kshwang@xsyu.edu.cn)
Source title: Proceedings - 2020 International Conference on Big Data and Artificial Intelligence and Software Engineering, ICBASE 2020
Abbreviated source title: Proc. - Int. Conf. Big Data Artif. Intell. Softw. Eng., ICBASE
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Big Data and Artificial Intelligence and Software Engineering, ICBASE 2020
Issue date: October 2020
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Article number: 9403802
Language: English
ISBN-13: 9781728196190
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Conference name: 2020 International Conference on Big Data and Artificial Intelligence and Software Engineering, ICBASE 2020
Conference date: October 23, 2020 - October 25, 2020
Conference location: Chengdu, China
Conference code: 168537
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: With the development of digitization in the oilfield widely, the petroleum industry has gradually deployed database systems and application software on cloud platform. Microservices, as the key technology of cloud platform, have become the mainstream architectural plan. This paper studies the method of constructing a technical indicators analysis system for drilling through a Microservice architecture, and in order to implement the analysis of the technical and economic indicators for drilling, proposes a model of cost control for drilling constructed with a method of big data analysis. Data cleaning and segmentation for data of drilling are basic steps, after that constructed a model of cost per meter for drilling. This system combines the Microservice architecture with big data processing, and through visual presentation, provides a decision-making basis for petroleum engineers. © 2020 IEEE.
Number of references: 10
Main heading: Big data
Controlled terms: Infill drilling - Application programs - Computer architecture - Data handling - Decision making - Information analysis - Petroleum industry - Gasoline - Cost benefit analysis
Uncontrolled terms: Analysis system - Cloud platforms - Cost controls - Design and implementations - Economic indicators - Key technologies - Technical indicator - Visual presentation
Classification code: 511.1 Oil Field Production Operations - 523 Liquid Fuels - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis - 911 Cost and Value Engineering; Industrial Economics - 912.2 Management
DOI: 10.1109/ICBASE51474.2020.00056
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village

312. Dynamic Response Analysis of Tubular String under Perforating Gun-shock Loads (*Open Access*)

Accession number: 20202908940178
Authors: Liu, Hongtao (1); Dou, Yihua (2); Cao, Lihu (1); Cao, Yinping (2); Xue, Yanpeng (1)
Author affiliation: (1) Tarim Oilfield Company, Petrochina, Korla; 841000, China; (2) Xi'An Shiyou University, Shaanxi, Xi'an; 710065, China
Corresponding author: Cao, Yinping(caoyinping029@163.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1549
Part number: 3 of 5
Issue: 3
Issue title: 2020 International Conference on Environment Science and Advanced Energy Technologies, ESAET 2020 - 2. Applied Materials
Issue date: June 29, 2020
Publication year: 2020
Article number: 032132
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Environment Science and Advanced Energy Technologies, ESAET 2020
Conference date: January 18, 2020 - January 19, 2020
Conference location: Chongqing, China
Conference code: 161554
Publisher: Institute of Physics Publishing
Abstract: To obtain the dynamic response of perforating string under gun-shock loads, a dynamical model was established based on the vibration mechanics theory of cantilever beam, and the differential equations of longitudinal vibration were deduced. The dynamic response was obtained according to the measured data of impact loads. The results show that vibration response of displacement, velocity, and acceleration were changed with a cycle of 15ms. The Von Mises stress near the packer is the largest owing to stress concentration. The analytic solution of natural frequency is close to the finite element analysis value, and the maximum relative error is below 5%.The velocity of stress waves propagating along the string approximates 5000m/s, which is close to the theoretical analysis value and is about 3.6 times that of sound velocity in water. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Dynamic response
Controlled terms: Perforated plates - Differential equations - Perforating
Uncontrolled terms: Analytic solution - Dynamic response analysis - Dynamical model - Longitudinal vibrations - Maximum relative errors - Vibration mechanics - Vibration response - Von Mises stress
Classification code: 408.2 Structural Members and Shapes - 921.2 Calculus
Numerical data indexing: Percentage 5.00e+00%, Time 1.50e-02s, Velocity 5.00e+03m/s
DOI: 10.1088/1742-6596/1549/3/032132
Funding Details: Number: 2016ZX05051, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

313. Application of Kalman Filter Algorithm in Track Prediction

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Authors: Xianwei, Zhang (1); Junqian, Shang (1); Qian, Zhang (2)
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Corresponding author: Junqian, Shang(sjq18740393961@163.com)
Source title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Abbreviated source title: Proc. - Int. Conf. Inf. Sci., Comput. Technol. Transp., ISCTT
Part number: 1 of 1
Issue title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Issue date: November 2020
Publication year: 2020
Pages: 292-296
Article number: 9363851
Language: English
ISBN-13: 9781728185750
Document type: Conference article (CA)
Conference name: 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Conference date: November 13, 2020 - November 15, 2020
Conference location: Shenyang, China
Conference code: 167693
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In the course of flight, trajectory prediction is to use a series of measured data such as course Angle, speed and flight altitude to predict the next moment or the next stage of the aircraft state, and output the specific trajectory. This paper analyzes the research status of the existing algorithms, aiming at the problems of high time complexity and large computational load of some prediction algorithms, the kalman filter algorithm is mainly introduced, which has the characteristics of linear optimal filtering, and has a good implementation effect when applied to specific engineering problems. © 2020 IEEE.
Number of references: 9
Main heading: Kalman filters
Controlled terms: Aircraft - Forecasting - Trajectories
Uncontrolled terms: Computational loads - Engineering problems - Flight altitudes - Implementation effects - Kalman filter algorithms - Optimal filtering - Prediction algorithms - Trajectory prediction
Classification code: 652.1 Aircraft, General
DOI: 10.1109/ISCTT51595.2020.00058
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

314. Study on the Measurement Method of Gypsum Slurry Flow in Large Diameter Pipe

Accession number: 20210809970505
Authors: Gu, Xiaobing (1); Ning, Xiang (1); Jia, Huiqin (2); Gong, Jingyi (2)
Author affiliation: (1) Datang Environmental Industry Group Co., Ltd., Beijing, China; (2) Xi'an Shiyou University, Shaanxi Province, China
Source title: 2020 IEEE 5th International Conference on Signal and Image Processing, ICSIP 2020
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Pages: 945-948
Article number: 9339421
Language: English
ISBN-13: 9781728168968
Document type: Conference article (CA)
Conference name: 5th IEEE International Conference on Signal and Image Processing, ICSIP 2020
Conference date: October 23, 2020 - October 25, 2020
Conference location: Virtual, Nanjing, China

Conference code: 166987
Sponsor: IEEE; Southeast University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: At present, in thermal power plants, generally in the small diameter of the pipeline through the installation of electromagnetic flowmeter to measure the amount of gypsum slurry injection. However, there is no gypsum grout meter on the market for large pipe diameter of more than 1 meter. According to the above characteristics, this paper aims to develop a large tube runoff measurement instrument. Proposed in this paper by using time difference method of flow measurement principle of ultrasonic sensor array, and the temperature characteristic of ultrasonic sensor and frequency characteristic was tested, finally using the sensor array of gypsum slurry was tested. Test results show that the sensor array based on ultrasonic technology to the measurement precision can reach 5%, the amount of gypsum slurry can satisfy the demands of field measurement. © 2020 IEEE.
Number of references: 15
Main heading: Gypsum
Controlled terms: Flowmeters - Thermoelectric power plants - Ultrasonic sensors - Flow measurement
Uncontrolled terms: Electromagnetic flow meters - Frequency characteristic - Large diameter pipes - Measurement instruments - Measurement precision - Temperature characteristic - Thermal power plants - Ultrasonic technology
Classification code: 482.2 Minerals - 615.4 Thermoelectric Energy - 631.1 Fluid Flow, General - 753.2 Ultrasonic Devices - 943.1 Mechanical Instruments - 943.2 Mechanical Variables Measurements
Numerical data indexing: Percentage 5.00e+00%, Size 1.00e+00m
DOI: 10.1109/ICSIP49896.2020.9339421
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

315. Non-intrusive sensing method of the phasor of system voltage for partial discharge diagnostics (*Open Access*)

Accession number: 20204609478362
Authors: Li, Fei (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, No. 18, 2nd Dianzi Road, Xi'an, China
Source title: IET Generation, Transmission and Distribution
Abbreviated source title: IET Gener. Transm. Distrib.
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Issue: 23
Issue date: December 4, 2020
Publication year: 2020
Pages: 5597-5606
Language: English
ISSN: 17518687
Document type: Journal article (JA)
Publisher: Institution of Engineering and Technology
Abstract: This study presents a non-intrusive sensing method to obtain the phasor of system voltage of overhead lines for a mobile partial discharge diagnostics platform; with the phasor, partial discharges detected by the mobile platform can be characterised by statistical phase-resolved patterns. Firstly, finite-element analysis simulations were conducted to understand the relations between overhead lines of different configurations and the electric field underneath. With an electric field sensor, the phasor of system voltage can be derived with the aid of a second measurement unit for system frequency. The two measurement units are synchronised by two GPS receivers with 1 pulse per second (PPS) accuracy. The method is based on the wide area measurement principle and was verified by laboratory experiments. Then, the methodology has been deployed in the 132/275/400 kV substation and underneath single-circuit overhead lines in the field. The phasor of system voltage on an overhead transmission line can be successfully derived, and phase-resolved partial discharge information can be calculated. This non-intrusive and mobile methodology is effective and efficient for practical field measurements. The method eliminated the needs of connecting to an on-site system voltage, and this is of great importance for diagnostics research carried out by mobile platforms. © 2020 The Institution of Engineering and Technology.
Number of references: 22
Main heading: Partial discharges
Controlled terms: Overhead lines - Simulation platform - Global positioning system

Uncontrolled terms: Electric field sensors - Field measurement - Laboratory experiments - Mobile platform - Overhead transmission lines - Phase resolved partial discharges - System frequency - Wide area measurement
Classification code: 701.1 Electricity: Basic Concepts and Phenomena - 706.2 Electric Power Lines and Equipment - 723.5 Computer Applications
DOI: 10.1049/iet-gtd.2019.1836
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

316. Vibration of drilling motors in unconventional oil and gas exploration with a miniature recorder

Accession number: 20201008255582
Authors: Li, Fei (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, No. 18, 2nd Dianzi Road, Xi'an, China
Corresponding author: Li, Fei(lif@xsyu.edu.cn)
Source title: Journal of Engineering
Abbreviated source title: J. Eng.
Volume: 2020
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Issue date: February 1, 2020
Publication year: 2020
Pages: 79-85
Language: English
E-ISSN: 20513305
Document type: Journal article (JA)
Publisher: Institution of Engineering and Technology, United States
Abstract: A low-cost and miniature vibration recorder was developed to capture the vibration data of drilling motors for their health assessment. The recorder is installed in the rotor catch of a conventional drilling motor in such a way that no additional length is added to the bottom hole assembly. The recorder is fitted with two triaxial vibration accelerometers with different ranges, a rate gyroscope, a temperature sensor, and an integrated circuit (IC) for timestamps. The recorder can log data over the full operation cycle of a drilling motor, including vibration during surface activities and downhole operation. It allows the vibration recorders to be easily deployed to motor operations. The vibration recorder has been deployed to drilling motors in unconventional horizontal wells. The data analysis showed that the recorder captured vibration data from the installation of the recorder in maintenance bases until the return of the tools. Not only downhole drilling vibration data were successfully obtained, but also surface vibration data during shipment, and rig-side handling was recorded; the vibration recorders provided adequate information of a drilling motor to asset owners for maintenance and operation optimisation. © 2020 Institution of Engineering and Technology. All rights reserved.
Number of references: 13
Main heading: Horizontal wells
Controlled terms: Gyroscopes - Infill drilling - Petroleum prospecting - Vibration analysis
Uncontrolled terms: Conventional drilling - Down-hole drilling - Downhole operation - Health assessments - Maintenance and operation - Surface activities - Triaxial vibrations - Unconventional oil and gas
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations
DOI: 10.1049/joe.2019.1130
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

317. Isothermal characteristics of methane adsorption and changes in the pore structure before and after methane adsorption with high-rank coal (*Open Access*)

Accession number: 20204209343274
Authors: Li, Teng (1, 2, 3); Wu, Caifang (4); Wang, Ziwei (4)

Author affiliation: (1) College of Petroleum Engineering, Xian Shiyou University, Xian, China; (2) Shandong Key Laboratory of Depositional Mineralization Sedimentary Mineral, Shandong University of Science and Technology, Qingdao, China; (3) Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil Gas Reservoirs, Xian Shiyou University, Xian, China; (4) School of Resources and Geosciences, China University of Mining and Technology, Xuzhou, China
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Source title: Energy Exploration and Exploitation
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Volume: 38
Issue: 5
Issue date: September 1, 2020
Publication year: 2020
Pages: 1409-1427
Language: English
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E-ISSN: 20484054
CODEN: EEEXDU
Document type: Journal article (JA)
Publisher: SAGE Publications Inc., United States
Abstract: The pore structure is an essential factor that influences the isothermal characteristics of methane adsorption of coal, and the pore structure is altered after methane adsorption. In this study, a high-rank coal sample was investigated via methane adsorption isothermal measurement, and changes in the pore structure were studied using low-pressure N2 adsorption and low-pressure CO2 adsorption before and after the methane adsorption. The excess adsorption capacity exhibits a rapid increase at low pressure, reaching a maximum when the test pressure is approximately 8 MPa. Following that, the excess adsorption capacity of the high-rank coal tends to decrease. After the methane adsorption, the pore volume and specific surface area of the micro-, meso-, and macropores increase as compared to those before the methane adsorption, especially for micropores with apertures greater than 0.8 nm and mesopores with apertures below 10 nm. This is mainly caused by high pressure in the methane adsorption, indicating a pressure effect on the pore structure after the methane adsorption. After the methane adsorption, the ratio of pores with various sizes in the high-rank coal is enhanced, but the connectivity for meso- and macropores presents a slight decrease. © The Author(s) 2020.
Number of references: 57
Main heading: Pore structure
Controlled terms: High pressure effects - Adsorption - Coal - Isotherms - Methane
Uncontrolled terms: Adsorption capacities - CO2 adsorption - High pressure - Isothermal measurements - Low pressures - Methane adsorption - N2 adsorption - Test pressure
Classification code: 524 Solid Fuels - 802.3 Chemical Operations - 804.1 Organic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Pressure 8.00e+06Pa, Size 1.00e-08m, Size 8.00e-10m
DOI: 10.1177/0144598720925979
Funding Details: Number: -, Acronym: -, Sponsor: Qinglan Project of Jiangsu Province of China; Number: 2016ZX05044001, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: 41572140, Acronym: NSFC;NNSF;NNSFC, Sponsor: National Natural Science Foundation of China; Number: 41872170, Acronym: NSFC;NNSF;NNSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

318. Comprehensive performance evaluation of Chinese nuclear power listed companies based on HSE perspective (*Open Access*)

Accession number: 20203209028482
Authors: Li, Zhixue (1); Dong, Ziyu (1)
Author affiliation: (1) Research Center of Petroleum Resource Economics and Management, Xi'An Shiyou University, Xi'an; 710065, China

Corresponding author: Li, Zhixue(1462117183@qq.com)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 510
Part number: 2 of 6
Issue: 2
Issue title: 2020 4th International Workshop on Renewable Energy and Development, IWRED 2020 - 1. Energy Engineering and Power Engineering
Issue date: July 13, 2020
Publication year: 2020
Article number: 022022
Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 2020 4th International Workshop on Renewable Energy and Development, IWRED 2020
Conference date: April 24, 2020 - April 26, 2020
Conference location: Sanya, China
Conference code: 161772
Publisher: Institute of Physics Publishing
Abstract: Safe development has always been China's most basic requirement for nuclear power companies. As China's economy has entered the stage of high-quality development, research on the sustainable development of the nuclear power industry is still necessary. From the perspective of HSE, the article constructs an innovative system, which reflects the financial status, industry characteristics, and HSE performance of nuclear power enterprises. After taking 56 Chinese nuclear power listed companies as samples, analytic hierarchy process is used to determine the weight of index, the power coefficient method and the comprehensive analysis and judgment method is used to determine the score, which all contribute to comprehensive performance evaluation. Final research shows that financial performance is the main factor affecting the comprehensive performance of listed nuclear power companies, while HSE performance and innovation performance should be considered to improve their overall performance in the future. At the same time, suggestions for the government and energy industries are put forward. © Published under licence by IOP Publishing Ltd.
Number of references: 32
Main heading: Nuclear energy
Controlled terms: Electric utilities - Nuclear power plants - Nuclear fuels
Uncontrolled terms: Chinese nuclear power - Comprehensive analysis - Comprehensive performance - Comprehensive performance evaluation - Financial performance - Industry characteristics - Innovation performance - Nuclear-power industry
Classification code: 613 Nuclear Power Plants - 932.2 Nuclear Physics
DOI: 10.1088/1755-1315/510/2/022022
Funding Details: Number: 16XJY007, Acronym: NSSFC, Sponsor: National Office for Philosophy and Social Sciences;
Funding text: Fund Project: This article is a project of the National Social Science Fund "Environmental Effect of New Energy Industry", Cost Characteristics and Price Subsidy Policy "(No. 16XJY007).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

319. Overpressure origin and its effects on petroleum accumulation in the conglomerate oil province in Mahu Sag, Junggar Basin, NW China

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Title of translation:
Authors: Li, Jun (1, 2); Tang, Yong (3); Wu, Tao (3); Zhao, Jingzhou (1, 2); Wu, Heyuan (1, 2); Wu, Weitao (1, 2); Bai, Yubin (1, 2)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Lab of Petroleum Accumulation Geology, Xi'an Shiyou University, Xi'an; 710065, China; (3) Research Institute of Exploration and Development, Xinjiang Oilfield Company, PetroChina, Karamay; 834000, China
Corresponding author: Zhao, Jingzhou(jzzhao@xsyu.edu.cn)

Source title: Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development
Abbreviated source title: Shiyou Kantan Yu Kaifa
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Issue date: August 23, 2020
Publication year: 2020
Pages: 679-690
Language: Chinese
ISSN: 10000747
CODEN: SKYKEG
Document type: Journal article (JA)
Publisher: Science Press
Abstract: The origin of overpressure and its effect on petroleum accumulation in the large Permian/Triassic conglomerate oil province in the Mahu Sag, Junggar Basin have been investigated based on comprehensive analysis of log curve combinations, loading-unloading curves, acoustic velocity-density cross-plot, and porosity comparison data. The study results show that there are two kinds of normal compaction models in the study area, namely, two-stage linear model and exponent model; overpressure in the large conglomerate reservoirs including Lower Triassic Baikouquan Formation and Permian Upper and Lower Wu'erhe Formations is the result of pressure transfer, and the source of overpressure is the overpressure caused by hydrocarbon generation expansion of Permian Fengcheng Formation major source rock. The petroleum generated by the source rock migrated through faults under the driving of hydrocarbon generation overpressure into the reservoirs to accumulate, forming the Permian and Triassic overpressure oil and gas pools. The occurrence and distribution of overpressure are controlled by the source rock maturity and strike-slip faults connecting the source rock and conglomerate reservoirs formed from Indosinian Movement to Himalayan Movement. As overpressure is the driving force for petroleum migration in the large Mahu oil province, the formation and distribution of petroleum reservoirs above the source rock in this area may have a close relationship with the occurrence of overpressure.
Number of references: 55
Main heading: Gasoline
Controlled terms: Compaction - Rocks - Unloading - Petroleum geology - Strike-slip faults - Landforms - Petroleum reservoir engineering - Acoustic wave velocity - Petroleum reservoirs
Uncontrolled terms: Compaction models - Comprehensive analysis - Fengcheng formations - Hydrocarbon generation - Occurrence and distribution - Petroleum accumulations - Petroleum migration - Pressure transfer
Classification code: 481.1 Geology - 484.1 Earthquake Measurements and Analysis - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 523 Liquid Fuels - 691.2 Materials Handling Methods - 751.1 Acoustic Waves
DOI: 10.11698/PED.2020.04.04
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

320. Identifying coal structure using logging data (*Open Access*)

Accession number: 20203008964687
Authors: Liu, Zhidi (1, 2); Tang, Xiaoyan (3); Yang, Junru (1); Shi, Mengxuan (1)
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Publisher: Institute of Physics Publishing
Abstract: Coal structure, which is important for the mining of CBM, is closely related to the coal reservoir fracture characteristics. This paper calculates the integrity coefficient, stability coefficient and fracture coefficient of coal, and constructs a chart confirming the division standard of the coal structure in the study area. The research results show that coal mechanical parameters can effectively represent coal structure. The integrity and stability coefficients of undeformed coal are the highest, and its fracture coefficient is the lowest; the integrity and stability coefficients of fragmented coal, granulated coal and mylonitized coal gradually decrease, and their fracture coefficients gradually increase. The methods described in the paper can classify coal structure relatively accurately and provide an effective new method for the delimiting of coal structure. © Published under licence by IOP Publishing Ltd.
Number of references: 8
Main heading: Coal
Controlled terms: Fracture
Uncontrolled terms: Coal reservoirs - Coal structure - Integrity coefficients - Logging data - Mechanical parameters - Research results - Stability coefficient - Study areas
Classification code: 524 Solid Fuels - 951 Materials Science
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Open Access type(s): All Open Access, Bronze
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321. Performance comparison of novel chemical agents for mitigating water-blocking problem in tight gas sands

Accession number: 20201408368454
Authors: Huang, Hai (1); Babadagli, Tayfun (2); Chen, Xin (3); Li, Huazhou (3); Zhang, Yanming (4)
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Source title: Proceedings - SPE International Symposium on Formation Damage Control
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Publisher: Society of Petroleum Engineers (SPE)

Abstract: Water-blocking can be a serious problem, causing a low gas production rate after hydraulic fracturing; a result of the strong capillarity in the tight sandstone reservoir aggravating the spontaneous imbibition. Fortunately, chemicals added to the fracturing fluids can alter the surface properties and thus prevent or reduce the water-blocking issue. We designed a spontaneous imbibition experiment to explore the possibility of using novel chemicals to both mitigate the spontaneous imbibition of water into the tight gas cores and measure the surface tensions between the air and chemical solutions. A diverse group of chemical species has been experimentally examined in this study, including a cationic surfactant (C12TAB), two anionic surfactants (O242 and O342), an ionic liquid (BMMIM BF4), a high pH solution (NaBO2), two nanofluids (Al2O3 and SiO2), and a series of house-made deep eutectic solvents (DES3-7, 9, 11, and 14). Experimental results indicate that the anionic surfactants (O242 and O342) contribute to low surface tensions, but cannot ease the water-blocking issue due to yielding a more water-wet surface. The high pH solution (NaBO2), ionic liquid (BMMIM BF-4), and brine (NaCl) significantly decrease the volume of water imbibed to the tight sand core through wettability alteration, and the cationic surfactant (C12TAB) leads to both surface tension reduction and an oil-wet rock surface, helping to prevent water-blocking. The different types of DESs and nanofluids exhibit distinctly different effects on expelling gas from the tight sand cores through water imbibition. This preliminary research will be useful in both selecting and utilizing proper chemicals in fracturing fluids to mitigate water-blocking problems in tight gas sands. Copyright 2020, Society of Petroleum Engineers
Number of references: 56
Main heading: Fracturing fluids
Controlled terms: Fluorescence - Oil wells - Anionic surfactants - Drilling fluids - Dyes - Ionic liquids - Nanopores - Cationic surfactants - Hydraulic fracturing - Nanofluidics - Indicators (chemical) - Sand - Tight gas - Aluminum oxide - Alumina - Sodium chloride - Silica - Gases
Uncontrolled terms: Chemical agent - Deep eutectic solvents - Spontaneous imbibition - Surface tension reduction - Tight sands - Tight sandstone reservoirs - Water-blocking - Wettability alteration
Classification code: 483.1 Soils and Soil Mechanics - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 632.5.2 Nanofluidics - 741.1 Light/Optics - 761 Nanotechnology - 801 Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 933 Solid State Physics
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Funding text: This research was conducted under the second author's (TB) NSERC Industrial Research Chair in Unconventional Oil Recovery (industrial partners are Petroleum Development Oman, Total E&P Recherché Développement, Husky Energy, Saudi Aramco, Devon, Suncor and BASF), with additional support provided through a NSERC Discovery Grant (No: RES0011227) to T. Babadagli and a NSERC Discovery Grant (No: NSERC RGPIN 05394) to H. Li. We gratefully acknowledge these supports. H. Huang is grateful for the financial supports provided by National Natural Science Foundation of China (No: 51874240), National Science and Technology Major Project (No: 2016ZX05047003-004) and the Key Laboratory Fund of Education Department of Shaanxi Province (No: 15JS086). X. Chen greatly acknowledges the Ph.D. Scholarship from the China Scholarship Council (CSC) (201806450029) for the financial support. Finally, we would like to extend our appreciation to Lixing Lin for his intensive work during the preparation of core samples and collection of experimental data.
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322. Environmental impact correction for resistivity logging in CBM horizontal well (*Open Access*)

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Authors: Liu, Zhidi (1, 2); Tang, Xiaoyan (3); Shi, Mengxuan (1); Yang, Junru (1)
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Conference date: June 19, 2020 - June 21, 2020
Conference location: Jinan, Vitual, China
Conference code: 162297
Publisher: IOP Publishing Ltd
Abstract: The resistivity logging in CBM horizontal well is under the influence of factors such as borehole, mud invasion and anisotropy. The environmental impact correction can improve the interpretation accuracy of CBM the horizontal well. This paper introduced in detail the correction methods of borehole, mud invasion and anisotropy, and the environmental impact of the resistivity logging in CBM horizontal well are automatically corrected using computer correction program. The results show that the method is easy to operate and feasible, and is highly operable. The corrected resistivity in horizontal well can approximately represent the real resistivity of the coal reservoir, which is able to improve the evaluation accuracy of the coal reservoir resistivity logging. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 8
Main heading: Horizontal wells
Controlled terms: Coal deposits - Anisotropy - Boreholes - Environmental impact
Uncontrolled terms: Coal reservoirs - Correction method - Evaluation accuracy - Mud invasion - Resistivity logging
Classification code: 454.2 Environmental Impact and Protection - 503 Mines and Mining, Coal - 512.1.1 Oil Fields - 931.2 Physical Properties of Gases, Liquids and Solids
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323. Effect of no-pressure curing temperature on bending property of 2D-T700/E44 composite

Accession number: 20213610863247
Authors: Ma, Yuqin (1); Wang, Jie (1); Chen, Yi (1); Ju, Luyan (2); Li, Shuangshuang (1); Zhao, Yatao (1)
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Publisher: ICE Publishing
Abstract: Carbon-fiber-reinforced polymer (CFRP) composites have received extensive attention in aerospace, weapon equipment, communication electronics, transportation and other fields. The improved compression-molding process is one of the most advantageous processes for preparing CFRP composites. It is important to understand the effects of molding process parameters, in particular temperature parameters, on the preparation of an ideal composite. This paper addresses the effect of the no-pressure curing temperature on the two-dimensional woven CFRP (2D-CFRP) bending property of the improved compression-molding process. 2D-T700/E44 composites were prepared under no-pressure curing temperatures of 80, 90, 100, 110, 120 and 130°C. The effect law and influence mechanism of the temperature parameter on the microstructure and bending property of composites were summarized. The results show that excessively high or low no-pressure curing temperatures are unfavorable for the preparation of 2D-T700/E44 composites. When the temperature is 110°C, the impregnation effect of the resin is ideal, and the defects are effectively controlled. The fracture morphology is reasonable, and the performance is greatly improved, so the bending strength reaches 860 MPa.
Number of references: 26
Main heading: Bending strength
Controlled terms: Compression molding - Carbon fiber reinforced plastics - Morphology - Curing - Pressure effects
Uncontrolled terms: Bending properties - Carbon fiber reinforced polymer composite - Compression molding process - Curing temperature - Fracture morphology - Influence mechanism - Temperature parameters - Weapon equipment
Classification code: 802.2 Chemical Reactions - 817.1 Polymer Products - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Pressure 8.60e+08Pa, Temperature 3.83e+02K, Temperature 3.93e+02K, Temperature 4.03e+02K
DOI: 10.1680/jemmr.19.00171
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Database: Compendex
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324. Compact tri-notched wideband bandpass filter based on multiple resonances with wide upper stopband

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Authors: Wang, Chenhao (1); Xi, Xiaoli (1); Zhao, Yuchen (1); Shi, Xiaomin (2)
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Language: English
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Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc
Abstract: In this letter, a compact tri-notched wideband bandpass filter based on stub-loaded ring resonator (SLRR) and shorted stub-loaded stepped impedance resonators (SSLSIR) with wide upper stopband is presented. The wideband characteristic is excited by coupling SLRR and SSLSIR with the arrangement of defected ground structures on the back of the substrate. By placing two sets of SSLSIRs inside and outside of the SLRR, three reflection poles can be formed in passband to introduce three notch bands with adjustable center frequencies. The quarter-wavelength inter digital coupled lines are used to generate multiple transmission zeros to suppress high-order harmonics to achieve a wide upper stopband characteristic. For validation, a wideband bandpass filter with a passband from 2.2 to 7.5 GHz and notch bands at 2.87, 5.69, and 6.5 GHz is fabricated. Measured results show that the 20 dB attenuation upper stopband can extend to 29 GHz. © 2020 Wiley Periodicals LLC
Number of references: 11
Main heading: Defected ground structures
Controlled terms: Bandpass filters - Optical resonators - Notch filters
Uncontrolled terms: High order harmonics - Multiple resonances - Multiple transmission zeros - Quarter-wavelength - Stepped impedance resonator - Wide upper stopband - Wideband bandpass filter - Wideband characteristics
Classification code: 703.2 Electric Filters - 741.3 Optical Devices and Systems
Numerical data indexing: Decibel 2.00e+01dB, Frequency 2.20e+09Hz to 7.50e+09Hz, Frequency 2.90e+10Hz, Frequency 6.50e+09Hz
DOI: 10.1002/mop.32540
Compendex references: YES
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325. Highway Travel Decision Model Based on Trip Time Reliability and Fuzzy Clustering

Accession number: 20205309704132
Authors: Chen, Jiao-Na (1); Zhang, Xiang (2)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou Univ., Xi'an, China; (2) Cccc First Highway Consultants Co. Ltd., Xi'an, China
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Abbreviated source title: CICTP : Transp. Evol. Impacting Futur. Mobil. - Sel. Pap. COTA Int. Conf. Transp. Prof.
Part number: 1 of 1
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Conference name: 20th COTA International Conference of Transportation Professionals: Transportation Evolution Impacting Future Mobility, CICTP 2020
Conference date: August 14, 2020 - August 16, 2020
Conference location: Xi'an, China
Conference code: 165707
Sponsor: Transportation and Development Institute (T and DI) of the American Society of Civil Engineers (ASCE)
Publisher: American Society of Civil Engineers (ASCE)
Abstract: Huge multi-source data sets are used in traffic information system research. As a popular indicator, travel time reliability can reflect the time variability and volatility of the transportation system, instead of the shortest path as the priority principle of travel decision-making. The research on how to calculate the index is relatively mature, but the significance and the level of the calculating value have not been researched completely. Based on the historical data, the non-parametric test, and fuzzy clustering are used to model the threshold of travel time reliability. The proposed method is described as the quality of reliability. Under the decision-making scenarios, it is applied for drivers to decide the best departure time and route choice. Finally, the established model is validated by using the expressway of Shaanxi in the case study. © 2020 ASCE.
Number of references: 7

Main heading: Decision making
Controlled terms: Fuzzy clustering - Traffic control - Reliability - Travel time
Uncontrolled terms: Historical data - Multisource data - Non-parametric test - Time variability - Traffic information systems - Transportation system - Travel decisions - Travel time reliability
Classification code: 431 Air Transportation - 432 Highway Transportation - 433 Railroad Transportation - 434 Waterway Transportation - 723 Computer Software, Data Handling and Applications - 912.2 Management
Compendex references: YES
Database: Compendex
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326. Fault Diagnosis of Asynchronous Motor Based on Envelope Spectrum and Step Frequency Division

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Authors: Ya, Gao (1); Bo, Li (2); Qinling, Zhu (2); Yi, Gao (3)
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Article number: 9233642
Language: English
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Document type: Conference article (CA)
Conference name: 17th IEEE International Conference on Mechatronics and Automation, ICMA 2020
Conference date: October 13, 2020 - October 16, 2020
Conference location: Beijing, China
Conference code: 164506
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: A composite fault separation method is proposed to solve the problem of multiple fault frequencies in the current spectrum of asynchronous motors. First using quadratic RMS noise reduction processing method to deal with the original data, using the Hilbert transform for low frequency envelope frequency information, use carpet step frequency division of the high frequency information processing in the form of realization of asynchronous motor coupling fault feature extraction, based on the experimental data of low frequency envelope signal and use carpet frequency division way of high frequency signal processing, the result was verified by the data processing process and methods of variety of failure data validity of judgment and processing. © 2020 IEEE.
Number of references: 11
Main heading: Induction motors
Controlled terms: Signal processing - Failure (mechanical) - Data handling - Failure analysis
Uncontrolled terms: Composite fault - Envelope spectra - Frequency division - Frequency information - High frequency signals - High-frequency informations - Hilbert transform - Separation methods
Classification code: 705.3.1 AC Motors - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing
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Database: Compendex
Data Provider: Engineering Village

327. Investigation of Self-Heating Effects in Vacuum Gate Dielectric Gate-All-Around Vertically Stacked Silicon Nanowire Field Effect Transistors

Accession number: 20204109331638
Authors: Su, Yali (1); Lai, Junhua (2); Sun, Li (2)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an, China; (2) School of Microelectronics, Xi'an Jiaotong University, Xi'an, China
Corresponding author: Su, Yali(sylemon@163.com)
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Article number: 9180354
Language: English
ISSN: 00189383
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CODEN: IETDAI
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: The self-heating effects in vacuum gate dielectric gate-All-Around field effect transistors (GAA FETs) with vertically stacked 4-nm silicon nanowire (SiNW) channels are investigated by 3-D TCAD simulation. The cross-sectional dimension-dependent thermal conductivity model of the SiNW is proposed for the precise numerical simulation of self-heating effects based on the temperature-dependent thermal conductivity of the bulk silicon. The thermal conductivity model which was verified by published data indicates that thermal conductivity of 4-nm SiNW is greatly reduced to below 10 W/mK due to the pronounced phonon boundary scattering. Simulation results shows that the vacuum gate dielectric devices undergo more severe self-heating effects than the solid gate dielectric GAA SiNW FETs, resulting in more serious performance degradation. Multiple heat sources generated by the three-stacked SiNWs make heat generation and diffusion more difficult. An effective method is proposed to suppress the self-heating effects by increasing the spacing of the gas gap within in a certain range and the around ambient gas pressure. © 1963-2012 IEEE.
Number of references: 45
Main heading: Gate dielectrics
Controlled terms: Dielectric materials - Heating - Silicon - Nanowires - Thermal conductivity - Silicon compounds - Field effect transistors
Uncontrolled terms: Ambient gas pressure - Multiple heat sources - Performance degradation - Phonon-boundary scattering - Self-heating effect - Silicon nanowire field-effect transistors - Temperature-dependent thermal conductivity - Thermal conductivity model
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 641.1 Thermodynamics - 708.1 Dielectric Materials - 714.2 Semiconductor Devices and Integrated Circuits - 761 Nanotechnology - 933 Solid State Physics
Numerical data indexing: Size 4.00e-09m
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Compendex references: YES
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328. Safety climate: Current status of the research and future prospects (*Open Access*)

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Authors: Luo, Tongyuan (1)

Author affiliation: (1) College of Electronic Engineering, Xi'an Shiyou University, No.18 Dianzi 2 Road, Shaanxi, Xi'an; 710065, China
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Issue date: December 2020
Publication year: 2020
Pages: 106-119
Language: English
ISSN: 20967527
E-ISSN: 26664496
Document type: Journal article (JA)
Publisher: KeAi Communications Co.
Abstract: In order to study the current situation and prospects of an improved safety climate, this paper provides an extensive literature review and analysis of the concept of safety climate. Following that, a summary of research results and a theoretical framework is presented. First, several definitions of safety climate are reviewed and discussed, and the significance of safety climate to the workshop is considered. Future potential focus areas in safety climate research are noted through the study of measurement tools and the relationship of safety climate to safety performance and safety behavior. Second, the structural model of the safety climate principle and its connotation explanation are also proposed. The five principles consist of 22 levels of safety principles, which can be combined into an overall safety climate structure. The literature on safety climate is drawn from accidents that clearly demonstrate the impact of safety climate on enterprise, government, and society. Finally, six new trends in safety climate research are highlighted. These include the relationship between a feeling of safety and the reality theory, the elimination of cognitive biases in risk perception, safety climate research from a psychological perspective, the quantitative development of safety climate research, the multidimensional structure of a safety climate and the influence mechanisms of safety climate on safety behavior. The results indicate that the safety climate is composed of four dimensions: (1) the attitude of senior executives, (2) safety supervision, (3) safety production environment and (4) the implementation of safety training and education. The aim of this in-depth analysis is to contribute to future research paths across several domains, suggesting the need for a multi-disciplinary approach. © 2020
Number of references: 67
Main heading: Risk perception
Controlled terms: Climate models - Safety engineering
Uncontrolled terms: Climate research - Defining and exploring safety climate - Dimension of safety climate - Principle and methodology - Relationship research - Safety behavior - Safety climate - Safety climate for workshop
Classification code: 443 Meteorology - 914 Safety Engineering - 914.1 Accidents and Accident Prevention - 921 Mathematics
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329. Process optimization of projection welding of nut based on regression analysis

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Title of translation:
Authors: Xing, Xiaofang (1); Ben, Qiang (2); Zhou, Yong (1); Lu, Hao (1); Han, Pei (1)
Author affiliation: (1) Xi'an Shiyou University, Xi'an; 710065, China; (2) Chinese People's Liberation Army No. 5720 Factory, Wuhu; 241000, China
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ISSN: 0253360X
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Document type: Journal article (JA)
Publisher: Harbin Research Institute of Welding
Abstract: Single factor experimental design was used for M6 welded square nuts and SAPH370 pickled hot-rolled steel plates in order to optimize the nut welded joint quality. The electrode force, welding current and welding time were picked out as the process parameters and the Pull-out load were weighted into a welding quality index. The mathematical model between the welding quality index and process parameters was obtained by regression analysis. The research results show that the welding current has the greatest effect on the Pull-out load, and the welding time and electrode pressure have a small effect on the Pull-out load. When the electrode pressure is small, the welding time has a large effect on the Pull-out load. When the electrode pressure is large, the welding current has a large effect on the Pull-out load. The interaction effect between electrode pressure and welding current is the largest, the interaction effect between welding current and welding time and the interaction effect between electrode pressure and welding time are smaller. Copyright © 2020 Transactions of the China Welding Institution. All rights reserved.
Number of references: 12
Main heading: Projection welding
Controlled terms: Regression analysis - Welding electrodes - Hot rolling - Pressure effects
Uncontrolled terms: Electrode force - Electrode pressure - Interaction effect - Process parameters - Pull-out loads - Research results - Welding current - Welding quality
Classification code: 535.1.2 Rolling Mill Practice - 538.2.1 Welding Processes - 538.2.2 Welding Equipment - 922.2 Mathematical Statistics - 931.1 Mechanics
DOI: 10.12073/j.hjxb.20200413004
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330. Wall clutter mitigation based on spread spectrum radar in through-the-wall radar

Accession number: 20200508112173
Authors: Shi, Xiaomin (1); Wang, Chenhao (2); Zheng, Chen (2)
Author affiliation: (1) Communication Engineering Department, Xi'an Shiyou University, Xi'an; Shaanxi, China; (2) Electronic Engineering Department, Xi'an University of Technology, Xi'an; Shaanxi, China
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Source title: Microwave and Optical Technology Letters
Abbreviated source title: Microwave Opt Technol Lett
Volume: 62
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Issue date: May 1, 2020
Publication year: 2020
Pages: 1987-1990
Language: English
ISSN: 08952477
E-ISSN: 10982760
CODEN: MOTLEO
Document type: Journal article (JA)
Publisher: John Wiley and Sons Inc, Postfach 10 11 61, 69451 Weinheim, Boschstrabe 12, 69469 Weinheim, Deutschland, 69469, Germany
Abstract: A new subspace method applied to through-the-wall radar for clutter mitigation is presented. The pseudo-random code continuous wave radar is used and the wall subspace selection algorithm is introduced. The performance of this method is demonstrated and compared with the singular value decomposition-based clutter mitigation methods. Results confirm that the new subspace method suppresses the wall clutter more thoroughly under the same conditions. © 2020 Wiley Periodicals, Inc.
Number of references: 8
Main heading: Singular value decomposition
Controlled terms: Radar clutter - Codes (symbols) - Spectroscopy - Clutter (information theory)

Uncontrolled terms: Pseudo random codes - Spread spectra - Sub-space methods - Through-the-wall radars - wall clutter mitigation
Classification code: 716.1 Information Theory and Signal Processing - 716.2 Radar Systems and Equipment - 723.2 Data Processing and Image Processing - 921 Mathematics
DOI: 10.1002/mop.32253
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

331. Error Correction Method of Crude Oil Moisture Content Detection Based on BP Neural Network (*Open Access*)

Accession number: 20204009294557
Authors: Dong, Pengmin (1); Zeng, Xianghu (1); Duan, Chengcai (2); Wang, Tianqi (1); Luo, Shichong (1); Wang, Peng (1); Guo, Qianqian (1); Zhao, Haikong (1)
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Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 558
Part number: 2 of 5
Issue: 2
Issue title: 2nd International Conference on Oil and Gas Engineering and Geological Sciences - Chapter 1. Oil and Gas Engineering
Issue date: September 4, 2020
Publication year: 2020
Article number: 022005
Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 2nd International Conference on Oil and Gas Engineering and Geological Sciences, OGEGS 2020
Conference date: July 4, 2020 - July 5, 2020
Conference location: Dalian, China
Conference code: 162954
Publisher: IOP Publishing Ltd
Abstract: Microwave phase-shifting sensor is one of the effective means to realize online detection of water content in high water-cut crude oil, but its detection accuracy is easily affected by salinity. Aiming at the mineralization components (NaCl and CaCl2) existing in water-bearing crude oil, the influence of different proportion and content of dual-component mineralization on the accuracy of microwave phase-shifting crude oil water content detection sensor was studied experimentally, and the influence rule of dual-component mineralization (NaCl and CaCl2) on the accuracy of crude oil water content detection was obtained. It is difficult to establish an accurate error compensation model because the relationship between the composition and content of salinity and the measured water content is affected by many factors. Therefore, a BP neural network model for error correction is established, which reduces the detection error of microwave phase-shifting crude oil moisture sensor from 13.912% to 1.821%, and improves the detection accuracy. BP neural network prediction model is superior to multiple linear regression prediction model. © Published under licence by IOP Publishing Ltd.
Number of references: 13
Main heading: Sodium chloride
Controlled terms: Crude oil - Linear regression - Moisture control - Neural networks - Microwave sensors - Mineralogy - Machine learning - Error detection - Moisture determination - Water content - Error compensation - Soil moisture
Uncontrolled terms: BP neural network model - BP neural networks - Content detection - Detection accuracy - Different proportions - Multiple linear regressions - Oil moisture content - On-line detection
Classification code: 482 Mineralogy - 483.1 Soils and Soil Mechanics - 512.1 Petroleum Deposits - 723.4 Artificial Intelligence - 731.3 Specific Variables Control - 732.2 Control Instrumentation - 922.2 Mathematical Statistics - 944.2 Moisture Measurements
Numerical data indexing: Percentage 1.39e+01% to 1.82e+00%

DOI: 10.1088/1755-1315/558/2/022005
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

332. Enhancement of thermal and mechanical properties of bismaleimide using a graphene oxide modified by epoxy silane (*Open Access*)

Accession number: 20203809200172
Authors: Jiang, Hao (1); Ji, Yanyan (2); Gan, Jiantuo (1); Wang, Lei (1)
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Source title: Materials
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Volume: 13
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Publication year: 2020
Article number: 3836
Language: English
E-ISSN: 19961944
Document type: Journal article (JA)
Publisher: MDPI AG, Postfach, Basel, CH-4005, Switzerland
Abstract: A thermosetting resin system, based on bismaleimide (BMI), has been developed via copolymerization of 4,4'-diaminodiphenylsulfone with a newly synthesized graphene oxide modified using epoxy silane (ES-GO). The effect of ES-GO on the thermomechanical and mechanical properties of cured modified resin was studied. To evaluate the efficiency of the modified BMI systems, the composite samples using glass fiber cloth were molded and tested. Thermogravimetric analysis indicates that the cured sample systems displays a high char yield at lower concentrations of ES-GO (≤ 0.5 wt.%), suggesting an improved thermal stability. Using dynamic mechanical analysis, a marked increase in glass transition temperature (Tg) with increasing ES-GO content was observed. Analysis of mechanical properties reveals a possible effect of ES-GO as a toughener. The results also showed that the addition of 0.3 wt.% ES-GO maximizes the toughness of the modified resin systems, which was further confirmed by the result of analysis of fracture surfaces. At the same time, a molded composite with ES-GO showed improved mechanical properties and retention rate at 150 °C as compared to that made with neat resin. © 2020 by the authors.
Number of references: 52
Main heading: Glass transition
Controlled terms: Graphene - Resins - Glass - Thermogravimetric analysis - Curing
Uncontrolled terms: Composite samples - Diaminodiphenylsulfone - Fracture surfaces - Molded composites - Retention rate - Thermal and mechanical properties - Thermo-mechanical - Thermosetting resin systems
Classification code: 761 Nanotechnology - 801 Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 804 Chemical Products Generally - 812.3 Glass - 815.1.1 Organic Polymers
Numerical data indexing: Temperature 4.23e+02K
DOI: 10.3390/ma13173836
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Funding text: This research received no external funding. The authors wish to thank for financial support from the provincial superior discipline of materials science and engineering of Xi'an Shiyou University; thank for financial support from the team of design and development of new energy materials and devices of Xi'an Shiyou University.Acknowledgments: The authors wish to thank for financial support from the provincial superior discipline of materials science and engineering of Xi'an Shiyou University; thank for financial support from the team of design and development of new energy materials and devices of Xi'an Shiyou University.
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

333. Influence of heat treatments on microstructure, mechanical properties and corrosion resistance of Inconel 625 overlay cladded using PTIG (*Open Access*)

Accession number: 20204209352857
Authors: Guo, Longlong (1); Xiao, Fei (2); Wang, Fan (2); Wei, Wenlan (1); He, Yutian (1); Luo, Foshu (1)
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Source title: Materials Research Express
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Issue: 9
Issue date: September 2020
Publication year: 2020
Article number: abb858
Language: English
E-ISSN: 20531591
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: The influence of post-weld heat treatment (PWHT) temperatures on the microstructure, mechanical properties and corrosion resistance of Inconel 625 overlay cladded using pulsed tungsten insert gas (PTIG) was studied. The microstructure observation shows that as welded Inconel 625 overlay exhibits notable difference in grains morphology and size, and some precipitates, such as laves phase and MC phase, are distributed in the interdendritic zone. With an increase in PWHT temperature, equiaxed dendrites transform to columnar dendrites, and the overall difference in the microstructure decreases gradually. Compared with the as welded overlay, the size and number of the precipitates for the overlay heat treated at 650 °C shows very slight change. When the PWHT temperature increases to 750 °C, δ phase precipitates with the dissolving of laves phase. The number of δ phase increases clearly, and its size coarsens obviously with a further increasing PWHT temperature. Tensile tests indicate that there is a slight increase in the yield strength (YS) and ultimate tensile strength (UTS), but a decrease in elongation with the raise of PWHT temperature, which is no greater than 750 °C. Conversely, when the PWHT temperature beyond 750 °C, the YS and UTS decrease, the elongation increases slightly. Corrosion tests in the environment containing H2S and CO2 reveal that the Inconel 625 overlay heat treated at 650 °C exhibits superior corrosion resistance than that of other temperatures. Whereas, with an increase in PWHT temperature, the corrosion resistance degenerates seriously for the formation of δ phase. © 2020 The Author(s). Published by IOP Publishing Ltd
Number of references: 37
Main heading: Corrosion resistance
Controlled terms: Heat treatment - Tensile testing - Morphology - Textures - Heat resistance - Tensile strength - Welding
Uncontrolled terms: Columnar dendrites - Equiaxed dendrite - Interdendritic zones - Microstructure observation - Morphology and size - Post weld heat treatment - Temperature increase - Ultimate tensile strength
Classification code: 537.1 Heat Treatment Processes - 538.2 Welding - 539.1 Metals Corrosion - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Temperature 1.02e+03K, Temperature 9.23e+02K
DOI: 10.1088/2053-1591/abb858
Funding Details: Number: 2020JQ-780, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: GCZX202001, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: Original content from this work may be used under the terms of the . Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI. Natural Science Basic Research Plan in Shaanxi Province of China 2020JQ-780 Young Teacher Research Project of Xi'an Shiyou University 0104-134010025 Open Foundation of Chongqing Engineering Technology Research Center for Light Alloy Materials and Processing GCZX202001 yes 2020 The Author(s). Published by IOP Publishing Ltd Creative Commons Attribution 4.0 licenceThis study is financially supported by the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2020JQ-780), the Open Foundation of Chongqing Engineering Technology Research Center for Light Alloy Materials and Processing (No. GCZX202001), and Young Teacher Research Project of Xi'an Shiyou University (No. 0104-134010025).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

334. Annular Pressure-Volume Interaction Analysis for HPHT Well Based on Multi-scale (*Open Access*)

Accession number: 20202908944681
Authors: Cao, Lihu (1); Dou, Yihua (2); Wang, Kelin (1); Xue, Shuai (3); Geng, Hailong (1)
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1549
Part number: 4 of 5
Issue: 4
Issue title: 2020 International Conference on Environment Science and Advanced Energy Technologies, ESAET 2020 - 3. Resource Utilization
Issue date: June 29, 2020
Publication year: 2020
Article number: 042125
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Environment Science and Advanced Energy Technologies, ESAET 2020
Conference date: January 18, 2020 - January 19, 2020
Conference location: Chongqing, China
Conference code: 161554
Publisher: Institute of Physics Publishing
Abstract: Annulus pressure build-up is a potentially serious issue with high-pressure and high-temperature wells created by annuli which maybe heated up during production. Considering the mass conservation, energy conservation, and heat stability of fluid, the pressure-volume interaction models of multi-scale annulus are established based on PVT and the matrix of micro-annular temperature fields. Results indicate that the pressure-volume interaction moves the balance point of adjacent annulus early, which is a potentially serious issue for well integrity. The relationship between annulus temperature and pressure is linear. Moreover, at the same production, annulus pressure rapidly rises as the temperature increases, and the change rate of temperature increases at a negative exponential function. After the same production time, the relationship among temperature, pressure, and production is a quadratic function. © Published under licence by IOP Publishing Ltd.
Number of references: 18
Main heading: Exponential functions
Uncontrolled terms: Annular pressures - Annulus pressures - High pressure and high temperature - Mass conservation - Negative exponential functions - Quadratic function - Temperature and pressures - Temperature increase
Classification code: 921 Mathematics
DOI: 10.1088/1742-6596/1549/4/042125
Funding Details: Number: 2016ZX05051, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This work was financially supported by Major national science and technology projects (No.2016ZX05051) fund.
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

335. Strong metric dimensions for power graphs of finite groups

Accession number: 20200246404
Authors: Ma, Xuanlong (1); Zhai, Liangliang (2)
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Source title: arXiv
Abbreviated source title: arXiv
Issue date: May 7, 2020
Publication year: 2020
Language: English
E-ISSN: 23318422
Document type: Preprint (PP)
Publisher: arXiv
Abstract: Let G be a finite group. The order supergraph of G is the graph with vertex set G, and two distinct vertices x, y are adjacent if o(x) | o(y) or o(y) | o(x). The enhanced power graph of G is the graph whose vertex set is G, and two distinct vertices are adjacent if they generate a cyclic subgroup. The reduced power graph of G is the graph with vertex set G, and two distinct vertices x, y are adjacent if hxi ⊂ ⟨#⟩ or ⟨#⟩ ⊂ ⟨#⟩. In this paper, we characterize the strong metric dimension of the order supergraph, the enhanced power graph and the reduced power graph of a finite group.MSC Codes 05C25, 05C69.
Number of references: 36
Uncontrolled terms: Enhanced power graph - Finite groups - Metric dimensions - Order supergraph - Power graphs - Reduced power graph - Strong metric dimension - Supergraph - Vertex set
Compendex references: YES
Preprint ID: 2005.03829v2
Preprint source website: https://arxiv.org
Preprint ID type: ARXIV
Database: Compendex
Data Provider: Engineering Village

336. A new coordination complex based on 2,2′–dipyridinium ligand as catalyst for the conversion of CO2 to propylene carbonate

Accession number: 20201508400437
Authors: Wang, Wen-Zhen (1); Lei, Zhe (1); Jia, Xin-Gang (1); Li, Lei-Lei (1); Fan, Wei (1)
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Corresponding author: Wang, Wen-Zhen(wzwang@xsyu.edu.cn)
Source title: Journal of Molecular Structure
Abbreviated source title: J. Mol. Struct.
Volume: 1212
Issue date: 15 July 2020
Publication year: 2020
Article number: 128003
Language: English
ISSN: 00222860
CODEN: JMOSB4
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Based on the ligand 2,2′–dipyridylamine (Hdpa) and di2-pyrazylamineHdpza, neutral molecular complexes [Co(Hdpa)2(NCS)2] (1) and [Co(Hdpza)2(NCS)2] (2) were synthesized. The DFT calculation of complex 1 was carried out to analyze the electron density distribution. Magnetic results indicate that a gradual decrease in #MT over the entire temperature range indicates strong zero-field splitting for the high-spin Co(II) ion in 1. The complex was used for the cycloaddition reaction of CO2 and propylene oxide, and compared with the reported complex 2 [Co(Hdpza)(NCS)2], the catalytic activity was 1 > 2. The Complex 1 exhibited excellent catalytic performance for converting CO2 into cyclic carbonates under mild conditions. For propylene oxide (PO) and CO2 synthesis of propylene carbonate (PC), the catalytic system showed a remarkable TOF as high as 5040 h-1. © 2020 Elsevier B.V.
Number of references: 44
Main heading: Carbon dioxide
Controlled terms: Cobalt compounds - Carbonates - Density functional theory - Ligands - Propylene - Catalyst activity - Cycloaddition - Synthesis (chemical) - Carbonation - Magnetism
Uncontrolled terms: Catalytic performance - Coordination complex - Cyclic carbonates - Cycloaddition reaction - DFT calculation - Molecular complexes - Propylene carbonate - Zero-field splittings
Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic

Compounds - 804.2 Inorganic Compounds - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
DOI: 10.1016/j.molstruc.2020.128003
Funding Details: Number: 2019JZ-44, Acronym: -, Sponsor: -; Number: Z18165, Acronym: -, Sponsor: -;
Funding text: This work was supported by the Natural Science Foundation of Shannxi Province (No: 2019JZ-44 ; 2017JQ2009), the Scientific Research Program Funds by Shannxi Provincial Education Department (Program No Z18165).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

337. Simulation and hardware implementation of demodulation for fiber optic seismic sensor with linear edge filtering method

Accession number: 20204609490859
Authors: Zhou, Rui (1); Gao, Hong (2); Feng, Zhongyao (1); Qiao, Xueguang (1)
Author affiliation: (1) School of Physics, Northwest University, Xi'an; 710069, China; (2) School of Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Qiao, Xueguang(xgqiao@nwu.edu.cn)
Source title: Optical Fiber Technology
Abbreviated source title: Opt. Fiber Technol.
Volume: 60
Issue date: December 2020
Publication year: 2020
Article number: 102384
Language: English
ISSN: 10685200
CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: The demodulation system is a very critical component of the seismic exploration, which determines the response speed and accuracy of data acquisition of the detection system. Here, we demonstrate a simulation and hardware implementation of demodulation system based on linear edge filtering method for fiber optic seismic sensor. The system is implemented mainly by an edge filter (long period fiber grating) with the linear slope of 1.368 dBm/nm and the sideband width of 6.05 nm, and a homemade circuit board. The results show that the system can be used to demodulate low-frequency (10 Hz–200 Hz) vibration signals, and the best signal-to-noise ratio is up to ~70 dB. Moreover, theoretically, the system could be used to demodulate higher frequency vibration and can be adapted to any vibration measurement, and suitable for engineering application due to the characteristics of simple structure, low cost, stable performance, fast response speed and high precision. © 2020 Elsevier Inc.
Number of references: 33
Main heading: Fiber optics
Controlled terms: Fibers - Vibration measurement - Seismology - Cost engineering - Demodulation - Fiber optic sensors - Seismic prospecting - Data acquisition - Optical variables measurement - Signal to noise ratio - Diffraction gratings
Uncontrolled terms: Critical component - Demodulation system - Engineering applications - Hardware implementations - Higher frequencies - Long period fiber grating - Seismic exploration - Stable performance
Classification code: 481.4 Geophysical Prospecting - 484.1 Earthquake Measurements and Analysis - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing - 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 911 Cost and Value Engineering; Industrial Economics - 941.4 Optical Variables Measurements - 943.2 Mechanical Variables Measurements
Numerical data indexing: Size 6.05e-09m
DOI: 10.1016/j.yofte.2020.102384
Funding Details: Number: 2017JM6112, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 61735014, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 61927812, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by National Key Research and Development Plan, Key strategic advanced electronic materials (No. 2017YFB0405502), National Natural Science Foundation of China (Nos. 61735014, 61927812), National Science and Technology Project, Large Oil and Gas Field and Coal Bed Gas Development Project (No. 2017ZX05019-006), and Natural Science Foundation of Shaanxi Province (No. 2017JM6112).

Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

338. Michelson Interferometric Humidity Sensor Based on Photonic Crystal Fiber

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Title of translation:
Authors: Shao, Min (1); Sun, Haonan (1); Zhang, Rong (1); Liu, Yinggang (1); Qiao, Xueguang (2)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Physical, Northwest University, Xi'an; 710069, China
Corresponding author: Shao, Min(shaomin@xsyu.edu.cn)
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Abbreviated source title: Guangxue Xuebao
Volume: 40
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Publication year: 2020
Article number: 2406002
Language: Chinese
ISSN: 02532239
CODEN: GUXUDC
Document type: Journal article (JA)
Publisher: Chinese Optical Society
Abstract: A fiber-optic Michelson interferometer based on a photonic crystal fiber (PCF) is proposed, constructed by fusing a piece of PCF and a single-mode fiber (SMF). The taper between the SMF and the PCF works as a coupler. It excites the high-order cladding modes and couples the fundamental mode of the core and high-order cladding mode after being reflected by the end face of the PCF to form an intermodal interference. Since all the air holes in the PCF are exposed to the environment, the moisture and the fiber are fully affected, effectively improving the sensor's humidity sensitivity. The experimental results show that the humidity sensitivity of the designed sensor is -0.095 dB/% with a linearity of 0.998 in a 30%90% relative humidity range. The temperature sensitivity is 0.008 nm/ with a linearity of 0.997 from 20100, and error in the humidity measurement, caused by temperature, is 0.01%/. The stability experiment indicates a humidity standard deviation of 0.25%, and the human breathing test shows a sensor response time of 190 ms. Importantly, the designed sensor has a simple structure, high sensitivity, good stability, fast response time, and is easy to fabricate, indicating excellent potential in humidity detection applications. © 2020, Chinese Lasers Press. All right reserved.
Number of references: 19
Main heading: Humidity sensors
Controlled terms: Crystal whiskers - Nonlinear optics - Single mode fibers - Fiber optics - Michelson interferometers - Atmospheric humidity - Photonic crystal fibers
Uncontrolled terms: Fiber optic Michelson interferometers - Humidity measurements - Humidity sensitivity - Humidity standards - Intermodal interferences - Relative humidity range - Sensor response time - Temperature sensitivity
Classification code: 443.1 Atmospheric Properties - 443.2 Meteorological Instrumentation - 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: Percentage 2.50e-01%, Time 1.90e-01s
DOI: 10.3788/AOS202040.2406002
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

339. China's deepwater development: subsurface challenges and opportunities

Accession number: 20203709159531
Authors: Li, Hangyu (1); Zhang, Ming (2); Lau, Hon Chung (3); Fu, Shiwen (4)
Author affiliation: (1) China University of Petroleum (East China), China; (2) RIPRD, PetroChina, China; (3) National University of Singapore, Singapore; (4) Xi'an Shiyou University, China
Corresponding author: Zhang, Ming(1027214218@qq.com)
Source title: Journal of Petroleum Science and Engineering

Abbreviated source title: J. Pet. Sci. Eng.
Volume: 195
Issue date: December 2020
Publication year: 2020
Article number: 107761
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: At present, China has three major deepwater oil and gas fields located in the Qiongdongnan and Pearl River Mouth basins in the South China Sea (SCS) at water depths ranging from 300 m to over 1500 m. In this paper, we compare the geology, reservoir, and fluid properties and development concepts of these deepwater fields with those in the Gulf of Mexico (GOM), Nigeria, and Brazil. Based on this comparison, we have identified several key subsurface challenges and opportunities for future deepwater field developments in China. Major subsurface challenges include smaller in-place volumes, heavier oil, lower reservoir energy, and higher reservoir temperature. Opportunities identified include locating continental margin systems with high accommodation volumes and abundant sand supply, use of alternative development concepts such as Floating Liquified Natural Gas (FLNG) and complaint platforms with dry tree wells and learnings from the recent development of lower-permeability reservoirs in deepwater GOM and the deepwater heavy oil developments and CO2 handling techniques in Brazil. © 2020
Number of references: 112
Main heading: Crude oil
Controlled terms: Geology - Heavy oil production - Low permeability reservoirs - Offshore gas fields - Petroleum reservoir engineering - Offshore oil wells - Gas industry - Oil field development
Uncontrolled terms: Continental margin - Deep water development - Deep water fields - Deepwater field development - Handling technique - Liquified natural gas - Pearl River Mouth basin - Reservoir temperatures
Classification code: 481.1 Geology - 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 512.2.1 Natural Gas Fields - 522 Gas Fuels
Numerical data indexing: Size 1.50e+03m
DOI: 10.1016/j.petrol.2020.107761
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

340. Surface wettability and flow properties of non-metallic pipes in laminar flow

Accession number: 20200107964196
Authors: Qi, Hongyuan (1, 2); Liang, Aiguo (3); Jiang, Huayi (1, 2); Shi, Jianying (4); Sun, Nana (1, 2); Wang, Yulong (1, 2)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (3) Karamay Hongshan Oilfield Co. Ltd., Karamay; Xinjiang; 834000, China; (4) No.1 Production Plant, Xinjiang Oilfield Branch Company, Karamay; Xinjiang; 834000, China
Corresponding author: Qi, Hongyuan(hyqi@xsyu.edu.cn)
Source title: Chinese Journal of Chemical Engineering
Abbreviated source title: Chin J Chem Eng
Volume: 28
Issue: 3
Issue date: March 2020
Publication year: 2020
Pages: 636-642
Language: English
ISSN: 10049541
CODEN: CJCEEB
Document type: Journal article (JA)
Publisher: Materials China

Abstract: In this paper, three liquids flowing in five pipes with the same inner diameter of 14 mm were studied to determine the relationship between the surface wettability and flow properties in laminar flow (Re © 2019 Elsevier B.V.
Number of references: 27
Main heading: Contact angle
Controlled terms: Drops - Reynolds number - Wetting - Friction - Regression analysis - Laminar flow - Metals - Pressure drop
Uncontrolled terms: Angle difference - Anomalous phenomena - Flexible composites - Frictional coefficients - Frictional resistance - Proportional relation - Single-phase flow - Surface wettability
Classification code: 631.1 Fluid Flow, General - 922.2 Mathematical Statistics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Size 1.40e-02m
DOI: 10.1016/j.cjche.2019.11.005
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

341. Principal component analysis-assisted selection of optimal denoising method for oil well transient data (*Open Access*)

Accession number: 20204209339627
Authors: Zhang, Bing (1); Muradov, Khafiz (2); Dada, Akindolu (2)
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Corresponding author: Zhang, Bing(zhangbing_cqing@163.com)
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Abbreviated source title: J. Pet. Explor. Prod. Technol.
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Publisher: Springer Science and Business Media Deutschland GmbH
Abstract: Oil and gas production wells are often equipped with modern, permanent or temporary in-well monitoring systems, either electronic or fiber-optic, typically for measurement of downhole pressure and temperature. Consequently, novel methods of pressure and temperature transient analysis (PTTA) have emerged in the past two decades, able to interpret subtle thermodynamic effects. Such analysis demands high-quality data. High-level reduction in data noise is often needed in order to ensure sufficient reliability of the PTTA. This paper considers the case of a state-of-the-art intelligent well equipped with fiber-optic, high-precision, permanent downhole gauges. This is followed by screening, development, verification and application of data denoising methods that can overcome the limitation of the existing noise reduction methods. Firstly, the specific types of noise contained in the original data are analyzed by wavelet transform, and the corresponding denoising methods are selected on the basis of the wavelet analysis. Then, the wavelet threshold denoising method is used for the data with white noise and white Gaussian noise, while a data smoothing method is used for the data with impulse noise. The paper further proposes a comprehensive evaluation index as a useful denoising success metrics for optimal selection of the optimal combination of the noise reduction methods. This metrics comprises a weighted combination of the signal-to-noise ratio and smoothness value where the principal component analysis was used to determine the weights. Thus the workflow proposed here can be comprehensively defined solely by the data via its processing and analysis. Finally, the effectiveness of the optimal selection methods is confirmed by the robustness of the PTTA results derived from the de-noised measurements from the above-mentioned oil wells. © 2020, The Author(s).
Number of references: 40
Main heading: Gaussian noise (electronic)

Controlled terms: Temperature - Wavelet transforms - Principal component analysis - Oil wells - Signal to noise ratio - Transient analysis - Wavelet analysis - Impulse noise - Quality control - Fiber optics - Gages - White noise
Uncontrolled terms: Comprehensive evaluation index - Noise reduction methods - Oil and gas production - Permanent downhole gauge - Pressure and temperature - Thermodynamic effect - Verification and application - Wavelet threshold de-noising
Classification code: 512.1.1 Oil Fields - 641.1 Thermodynamics - 716.1 Information Theory and Signal Processing - 741.1.2 Fiber Optics - 913.3 Quality Assurance and Control - 921 Mathematics - 921.3 Mathematical Transformations - 922.2 Mathematical Statistics - 943.3 Special Purpose Instruments
DOI: 10.1007/s13202-020-01010-3
Funding Details: Number: -, Acronym: -, Sponsor: Heriot-Watt University; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

342. Nonlinear finite element analysis of rod string in rod pumping system (*Open Access*)

Accession number: 20204809537060
Authors: Yan, Wenhui (1); Qu, Yinan (2); Xie, Dong (1); Wu, Heng (1); Peng, Yong (1)
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Corresponding author: Yan, Wenhui(ywh369@xsyu.edu.cn)
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Issue: 1
Issue title: 2020 International Conference on Mechatronics Technology and Intelligent Manufacturing, ICMTIM 2020
Issue date: October 29, 2020
Publication year: 2020
Article number: 12059
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Mechatronics Technology and Intelligent Manufacturing, ICMTIM 2020
Conference date: August 28, 2020 - August 30, 2020
Conference location: Xi'an, China
Conference code: 164483
Publisher: IOP Publishing Ltd
Abstract: Rod pumping is the main oil recovery method at home and abroad. The corresponding displacement and load of the sucker rod section are important parameters in the system. This paper uses the advantages of the finite element method to solve the three nonlinear problems in the rod string model, and establishes its finite element analysis model. According to the upper and lower boundary conditions and initial conditions, the software is used to program and calculate. The surface dynamometer card of multi-level steel rod columns and glass fiber reinforced plastics-steel hybrid rod string is predicted, and the calculation results with and without considering mass nonlinearity are compared and analyzed. The feasibility of predicting the surface dynamometer card by the finite element method is verified. It is proved that the coupling has a great influence on the mechanical properties of the glass fiber reinforced plastics-steel hybrid rod string. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 10
Main heading: Finite element method
Controlled terms: Reinforcement - Steel fibers - Dynamometers - Glass fibers
Uncontrolled terms: Calculation results - Dynamometer card - Finite element analysis model - Initial conditions - Lower boundary conditions - Non-linear finite-element analysis - Nonlinear problems - Rod pumping systems

Classification code: 812.3 Glass - 819.4 Fiber Products - 921.6 Numerical Methods - 943.1 Mechanical Instruments - 951 Materials Science
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Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

343. Active and passive source Rayleigh wave joint imaging of the shallow structure in the Caotan Camp area, southwestern Ordos Basin

Accession number: 20194807758444
Authors: Li, Xinxin (1, 2); Li, Qingchun (3); Lei, Yuhang (4); Shen, Hongyan (1, 2)
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Corresponding author: Li, Xinxin(xxli@xsyu.edu.cn)
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Volume: 130
Issue date: March 2020
Publication year: 2020
Article number: 105986
Language: English
ISSN: 02677261
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The shallow surface of the southern Ordos Basin is a thick Quaternary loess layer with a loose and unstable structure, which threatens the stability of local infrastructure and has a great impact on oil and gas seismic exploration in this area. Therefore, identifying the internal velocity structure of the loess sediments is of critical importance. In this study, joint imaging of active and passive source Rayleigh waves was utilized to reveal the shallow shear-wave velocity (vs) structure in the Caotan Camp area, southwestern margin of the Ordos Basin. Active source Rayleigh waves were recorded by long-spread geophone array and processed by an improved F–K transform algorithm to extract multi-mode Rayleigh-wave dispersion curves. The passive source seismic signals were collected by broadband seismographs, and the phase velocities at discrete frequencies of the passive source Rayleigh wave were calculated by Aki's spectral formula. A nested genetic and damped least squares (DLS) algorithm was used for the joint inversion of the active and passive source Rayleigh wave dispersion curves. The two-dimensional vs section under the survey line reveals the thickness and stratification of loess sediments in the study area. The joint imaging of the active and passive source Rayleigh wave also effectively increases the investigation depth, allowing to obtain the bedrock interface below the loess sediments. © 2019 Elsevier Ltd
Number of references: 38
Main heading: Sediments
Controlled terms: Seismology - Dispersion (waves) - Wave propagation - Petroleum prospecting - Shear waves - Acoustic wave velocity - Metamorphic rocks - Seismic waves - Rayleigh waves - Shear flow
Uncontrolled terms: Active source - Broadband seismograph - Damped least squares (DLS) - Discrete frequencies - Passive source - Rayleigh-wave dispersion - Seismic exploration - Shear wave velocity structure
Classification code: 483 Soil Mechanics and Foundations - 484 Seismology - 484.1 Earthquake Measurements and Analysis - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 751.1 Acoustic Waves - 931.1 Mechanics
DOI: 10.1016/j.soildyn.2019.105986
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Funding text: This research was financed by the National Natural Science Foundation of China (No. 41874123). The seismic data of this study area were collected by the Special Districts Geological Mapping Project of the China

Geological Survey Bureau (DD20160060). The authors wish to thank the support of the foundation and all the individuals involved in the research.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

344. Oil Field Crude Oil Production Level Prediction Method Based on AHP-PSO-BP

Accession number: 20204409406576
Authors: Hu, Hongtao (1); Pu, Yingzi (1); Guan, Xin (2)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, Shaanxi, China; (2) Research Institute of Petroleum, Exploration Development, Beijing, China
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Article number: 9205072
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ISBN-13: 9781728189758
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Conference name: 8th IEEE International Conference on Information, Communication and Networks, ICICN 2020
Conference date: August 22, 2020 - August 25, 2020
Conference location: Xi'an, China
Conference code: 163514
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The crude oil production level is an important index to determine the degree of oil field development. There are many factors that affect the crude oil production level, and the amount of data is huge. The complicated relationships between the factor parameters bring great difficulties to the production level prediction. This paper presents a crude oil production level prediction model based on AHP-PSO-BP. When using the BP neural network to predict crude oil production level, we first utilize AHP to select parameters with higher weights to optimize the BP network input, and then we use PSO algorithm to optimize the weights and thresholds of the BP network. With these two optimizations, we have improved the stability and prediction accuracy of the BP network. Experimental results show that when using the AHP-PSO-BP prediction model to predict the crude oil production level, the determination coefficient R2 we obtained from the model is 95.328%, which is better than the value we obtained from BP network model (82.356%), and GA-BP network model (70.509%). Besides, the AHP-PSO-BP prediction model convergence is faster, the prediction accuracy is higher and the network is more stable. © 2020 IEEE.
Number of references: 11
Main heading: Forecasting
Controlled terms: Neural networks - Crude oil - Backpropagation - Hierarchical systems - Oil field development
Uncontrolled terms: BP neural networks - Crude oil production - Determination coefficients - Ga-bp networks - Prediction accuracy - Prediction methods - Prediction model - Production level
Classification code: 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 723.4 Artificial Intelligence - 961 Systems Science
Numerical data indexing: Percentage 7.05e+01%, Percentage 8.24e+01%, Percentage 9.53e+01%
DOI: 10.1109/ICICN51133.2020.9205072
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

345. High-Sensitivity Temperature Sensor Based on Photosensitive Polymer-Filled Silica Capillary Tube

Accession number: 20204709518222
Authors: Liu, Yinggang (1); Li, Bowen (1); Song, Xiaoya (1); Huang, Liang (1); Dong, Jingfei (1); Fu, Haiwei (1); Jia, Zhenan (1); Gao, Hong (1)

Author affiliation: (1) Shaanxi Engineering Research Center of Oil and Gas Resource Optical Fiber Detection, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Yinggang(ygliu@xsyu.edu.cn)
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Issue date: December 1, 2020
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Pages: 1461-1464
Article number: 9244155
Language: English
ISSN: 10411135
E-ISSN: 19410174
CODEN: IPTLEL
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: A highly sensitive fiber-optic extrinsic Fabry-Perot interferometer (EFPI) is designed and demonstrated experimentally. The EFPI is composed of two sections of single mode fiber (SMF), a segment of silica capillary tube (SCT), an air cavity, and cured polymer which is filled in the SCT. The sensing part of structure of proposed EFPI is the air cavity, and the cured polymer has a modulating effect on the air cavity. Due to the high thermal expansion coefficient (TEC) of the polymer, the sensor exhibits a high sensitivity to temperature. Experimental results show that the temperature sensitivity of the proposed sensor reaches -2.88 nm/°C with a perfect linearity of 99.88%. Therefore, the proposed sensor with high-sensitivity, ease of fabrication and low cost is favorable to be used in high-accuracy temperature measurement. © 1989-2012 IEEE.
Number of references: 16
Main heading: Fiber optic sensors
Controlled terms: Capillary tubes - Thermal expansion - Glass transition - Single mode fibers - Temperature measurement - Silica - Fiber optics
Uncontrolled terms: Extrinsic Fabry Perot interferometer - High sensitivity - High thermal - High-accuracy - Modulating effect - Photosensitive polymers - Silica capillary - Temperature sensitivity
Classification code: 619.1 Pipe, Piping and Pipelines - 641.1 Thermodynamics - 741.1.2 Fiber Optics - 802.3 Chemical Operations - 944.6 Temperature Measurements - 951 Materials Science
Numerical data indexing: Percentage 9.99e+01%
DOI: 10.1109/LPT.2020.3034728
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Funding text: Manuscript received September 18, 2020; revised October 21, 2020; accepted October 26, 2020. Date of publication October 29, 2020; date of current version November 10, 2020. 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 the 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 YCS19211032. (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 (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; hwfu@xsyu.edu.cn; jiazhen_an@xsyu.edu.cn; gaohong@xsyu.edu.cn).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

346. Design and Simulation of Plasma Spraying Velocity Control System for Conical Screw Thread of Injection Molding Machine

Accession number: 20202508836572
Authors: Xu, Xiangqian (1); Li, Guoming (2); Zhang, Xinyou (2); Lin, Fanjun (2)
Author affiliation: (1) Xi'an Shiyou University, School of Material Science and Engineering, Xi'an, China; (2) China Xi'an Changqing Technology Engineering Co. Ltd., Xi'an, China

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Abbreviated source title: Proc. - Int. Conf. Comput. Eng. Appl., ICCEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Engineering and Application, ICCEA 2020
Issue date: March 2020
Publication year: 2020
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Article number: 9103779
Language: English
ISBN-13: 9781728159041
Document type: Conference article (CA)
Conference name: 2020 International Conference on Computer Engineering and Application, ICCEA 2020
Conference date: March 27, 2020 - March 29, 2020
Conference location: Guangzhou, China
Conference code: 160455
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: The plasma spraying speed control system for the conical screw thread of injection molding machine was designed and simulated in order to improve the movement precision of the welding torch. According to the regularity of thread formation, the master-slave synchronous control system of double motor speed was designed, which completed the accurate movement of welding torch. The combination of Smith predictive compensation and single neuron PID control was adopted in the paper because of the relatively large hysteresis of master-slave synchronous control of dual motor speed. The algorithm used to adjust the parameters of the control system. The simulation has been carried out by the computer, and the result shows that it has better control effect. © 2020 IEEE.
Number of references: 7
Main heading: Plasma spraying
Controlled terms: Screw threads - Plasma jets - Injection molding
Uncontrolled terms: Design and simulation - Double motors - Large hysteresis - Predictive compensation - Single neuron PID controls - Synchronous control - Synchronous control systems - Thread formation
Classification code: 601.2 Machine Components - 813.1 Coating Techniques - 932.3 Plasma Physics
DOI: 10.1109/ICCEA50009.2020.00097
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

347. Design and analysis of intelligent retrieval system for drilling data and completion data based on cloud platform (*Open Access*)

Accession number: 20203709173294
Authors: Zhao, Yifan (1); Wang, Kuisheng (1); Chen, Lianguo (2)
Author affiliation: (1) School of Computer, Xi'an Shiyou University, Xi'an, Shaanxi; 710065, China; (2) Changqing General Drilling Company, Xi'an, shaanxi; 710018, China
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Language: English
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Conference name: 2020 International Symposium on Electronic Information Technology and Communication Engineering, ISEITCE 2020
Conference date: June 19, 2020 - June 21, 2020
Conference location: Jinan, China

Conference code: 162447
Publisher: Institute of Physics Publishing
Abstract: In the context of the accelerating cloud platform construction in the oil industry, this paper solves the problem of difficulty in drilling and completion data retrieval by classifying and sorting drilling data and completion data to construct an intelligent retrieval model for drilling and completion data. Based on the cloud platform environment, this paper studies the method of constructing an retrieval system for drilling data and completion data through the microservice architecture. This system provides a unified retrieve page for structured data and unstructured data of drilling and completion operations. By using the ElasticSearch full-text search engine to build a retrieval model, it provides users with fast, efficient, and convenient comprehensive query and retrieval services, and lays a foundation for the intelligent construction of drilling and completion platforms. © Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Search engines
Controlled terms: Infill drilling - Query processing - Information retrieval
Uncontrolled terms: Design and analysis - Drilling and completion - Full-text search engines - Intelligent constructions - Intelligent retrieval - Retrieval models - Retrieval systems - Unstructured data
Classification code: 511.1 Oil Field Production Operations - 723 Computer Software, Data Handling and Applications - 903.3 Information Retrieval and Use
DOI: 10.1088/1742-6596/1607/1/012026
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

348. Integrated optic-fiber sensor based on enclosed EFPI and structural phase-shift for discriminating measurement of temperature, pressure and RI

Accession number: 20200608142034
Authors: Yang, Danqing (1); Liu, Yinggang (1); Wang, Yuxi (1); Zhang, Ting (1); Shao, Min (1); Yu, Dakuan (1); Fu, Haiwei (1); Jia, Zhenan (1)
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Corresponding author: Liu, Yinggang(ygliu@xsyu.edu.cn)
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Article number: 106112
Language: English
ISSN: 00303992
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Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: An optic-fiber sensor based on integration of extrinsic Fabry–Pérot interferometer (EFPI) and phase-shifted fiber Bragg grating (PS-FBG) is depicted and demonstrated. The proposed sensor structure mainly consists of an enclosed EFPI fabricated with photosensitive adhesive between two end-faces of a halved FBG. Since the periodic refractive index (RI) distribution of FBG is interrupted and resulted in a structural PS-FBG in the middle of FBG. Consequently, the enclosed EFPI is capable of measuring the variations of temperature, pressure and RI due to optical cavity length changes, whereas the notch wavelength of introduced structural phase-shift spectrum is only sensitive to temperature, and the intensity of structural phase-shift spectrum is only insensitive to pressure. Therefore, the discriminating measurement of temperature, pressure and RI can be realized, due to using the methods of wavelength modulation and intensity modulation. The relative errors of temperature, pressure and RI, between the analysis results and measurement values, are 1.4%, 4.1% and 0.1%. The proposed integrated sensor with cost-effective merit has a promising research prospect in the field of the multiple parameters distinguish measurement. © 2020 Elsevier Ltd
Number of references: 21
Main heading: Refractive index
Controlled terms: Cost effectiveness - Interferometers - Adhesives - Fiber Bragg gratings - Modulation

Uncontrolled terms: Integrated sensors - Intensity modulations - Measurement of temperature - Multiple parameters - Optic fiber sensor - Phase shifted fiber bragg grating (PSFBG) - Photosensitive adhesives - Wavelength modulation
Classification code: 741.1 Light/Optics - 911.2 Industrial Economics - 941.3 Optical Instruments
Numerical data indexing: Percentage 1.00e-01%, Percentage 1.40e+00%, Percentage 4.10e+00%
DOI: 10.1016/j.optlastec.2020.106112
Funding Details: Number: 18JS093, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Provincial Department of Education; Number: 2013JM8032, Acronym: -, Sponsor: -; Number: 61805197, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

349. Memory-aware resource management algorithm for low-energy cloud data centers

Accession number: 20202908957834
Authors: Liang, Bin (1, 2); Dong, Xiaoshe (1); Wang, Yufei (1); Zhang, Xingjun (1)
Author affiliation: (1) School of Electronic and Information Engineering, Xi'an Jiaotong University, Xi'an, China; (2) School of Computer Science, Xi'an Shiyou University, Xi'an, China
Corresponding author: Dong, Xiaoshe(xsdong@mail.xjtu.edu.cn)
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Abbreviated source title: Future Gener Comput Syst
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Publication year: 2020
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Language: English
ISSN: 0167739X
CODEN: FGCSEV
Document type: Journal article (JA)
Publisher: Elsevier B.V.
Abstract: The continuous advancement of cloud computing technology has driven the vigorous development of cloud data centers. This manifests itself not only in increasing numbers, but also in rapid expansion scale. At the same time, the problems of high energy consumption, high cost and high carbon emissions began to stand out. These factors have become a bottleneck restricting the further development of cloud computing technology. As a result of the application of virtualization technology, mature cloud service providers use virtual machines instead of physical machines to provide users with computing, storage and other services. Therefore, the scheduling algorithm of cloud tasks and virtual machines has been widely studied by academia as a core problem. However, most of the current cloud data center resource management algorithms take CPU utilization as the main consideration, and increase the CPU utilization through virtual machine integration to reduce the energy consumption of cloud data centers. However, these algorithms will cause waste and low utilization of other resources in the cloud data center due to excessive consideration of CPU utilization. This paper systematically analyzes the mapping relationship between cloud tasks, virtual machines and physical machines. At the same time, the performance of cloud tasks, virtual machines, and physical machines is modeled in the cloud data center. By comprehensively considering the CPU and memory characteristics of cloud tasks, the memory priority cloud task mapping rule is established. Based on the rule, the memory-aware resource management algorithm for low-energy cloud data centers (MALE) is proposed. The algorithm maps cloud tasks and deploys virtual machines according to the memory requirements of the cloud tasks, thereby achieving the goal of simultaneously reducing the total fee of cloud users and the energy consumption of cloud data centers. Finally, the algorithm is compared with the other three algorithms. The experimental simulation results show that the effect of the proposed algorithm in this paper is significantly better than the comparison algorithm for the total fee of cloud users and the energy consumption of the cloud data center. © 2020 Elsevier B.V.
Number of references: 52
Main heading: Virtual machine
Controlled terms: Digital storage - Green computing - Natural resources management - Cloud computing - Energy utilization - Network security - Scheduling algorithms - Mapping - Information management - Resource allocation

Uncontrolled terms: Cloud computing technologies - Cloud service providers - Experimental simulations - High energy consumption - Mapping relationships - Memory requirements - Resource management algorithms - Virtualization technologies
Classification code: 405.3 Surveying - 454 Environmental Engineering - 525.3 Energy Utilization - 722.1 Data Storage, Equipment and Techniques - 722.4 Digital Computers and Systems - 723 Computer Software, Data Handling and Applications - 723.5 Computer Applications - 912.2 Management
DOI: 10.1016/j.future.2020.07.026
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

350. Fractal Characteristics of the Microstructures of Three Hydrophobic Surfaces with Steel Substrate and Their Effects on Wettability

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Title of translation:
Authors: Jiang, Huayi (1, 2); Liu, Mei (1); Qi, Hongyuan (1, 2); Liang, Aiguo (3); Wang, Yulong (1, 4); Sun, Nana (1, 2); Wu, Zhe (1)
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Corresponding author: Qi, Hongyuan(hyqi@xsyu.edu.cn)
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Pages: 1313-1319
Language: Chinese
ISSN: 02510790
CODEN: KTHPDM
Document type: Journal article (JA)
Publisher: Higher Education Press Limited Company
Abstract: The microstructures on 304 stainless steel, X80 pipeline steel and 45# steel surfaces were prepared at different etching times by using the chemical etching and modification with low-surface-energy material. The microstructures and wettabilities of different material surfaces were obtained by a scanning electronic microscope and a contact angle meter, respectively. The fractal parameters were calculated by Matlab software. The results showed that the hydrophobic surfaces prepared on three materials had fractal characteristics. The optimal etching time was 30 min. At that time, the maximum subset of multifractal spectrum was close to the leftmost, the corresponding singularity index was the smallest, and the fractal dimension also reached the maximum. The linear fitting results of fractal dimension and contact angle was good. The contact angle increased with the increase of fractal dimension. © 2020, Higher Education Press. All right reserved.
Number of references: 26
Main heading: Wetting
Controlled terms: Etching - Fractal dimension - Hydrophobicity - Chemical modification - Contact angle - MATLAB - Microstructure
Uncontrolled terms: 304 stainless steel - Fractal characteristics - Hydrophobic surfaces - Low surface energy materials - Multi-fractal spectrum - Scanning electronic microscopes - Singularity indices - X80 pipeline steels
Classification code: 723.5 Computer Applications - 802.2 Chemical Reactions - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Time 1.80e+03s
DOI: 10.7503/cjcu20200050

Funding Details: Number: YCS19212041, Acronym: -, Sponsor: -; Number: 2018JQ5206, Acronym: -, Sponsor: -; Number: 51904246, Acronym: -, Sponsor: -;
Funding text: Supported by the Natural Science Basic Research Program of Shaanxi Province, China(Nos.2019JQ-819, 2018JQ5206), the National Natural Science Foundation of China(No.51904246) and the Project on Cultivation of Graduate Innovation and Practice Ability of Xi'an Shiyou University, China(Nos.YCS19212043, YCS19212041).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

351. Experimental study on the scale effect of strength and deformation of Chang 7 shale in Ordos Basin

Accession number: 20210209763876
Title of translation: 7
Authors: Li, Shuai (1, 2); Chen, Junbin (1, 2); Wang, Hanqing (3); Gong, Diguang (1, 2); Nie, Xiangrong (1, 2)
Author affiliation: (1) Shaanxi Key Laboratory of Well Stability and Fluid & Rock Mechanics in Oil and Gas Reservoirs, Xi'an Shiyou University, Xi'an; 710065, China; (2) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (3) State Key Laboratory of Petroleum Resources and Exploration, China University of Petroleum (Beijing), Beijing; 102249, China
Corresponding author: Chen, Junbin(chenjbxu@126.com)
Source title: Meitan Xuebao/Journal of the China Coal Society
Abbreviated source title: Meitan Xuebao
Volume: 45
Issue: 12
Issue date: December 2020
Publication year: 2020
Pages: 4121-4131
Language: Chinese
ISSN: 02539993
CODEN: MTHPDA
Document type: Journal article (JA)
Publisher: China Coal Society
Abstract: Shale has an obvious bedding structure and strong heterogeneity,and its strength and deformation characteristics have a significant scale effect,which makes the test results of small-scale rock samples in the laboratory to be limited in characterizing the mechanical properties of large-scale shale rock mass in the mine.In order to explore the scale effect law of shale strength and deformation,taking the continental shale outcrop of Yanchang Formation 7 in Ordos Basin as the research object,the triaxial compression tests of 11 rock samples with height diameter ratio of 2,diameter of 17,20,25 and 38 mm were carried out with RTR-1000 rock triaxial testing system.Based on the analysis of the scale effect law and its internal mechanism of shale strength and deformation,a new scale effect model for shale strength was proposed,and the reasonable test scale of indoor rock sample in characterizing shale field was preliminarily obtained.The results show that most of the mechanical parameters describing the strength and deformation of shale have significant scale effect,and the elastic modulus and Poisson's ratio increase with the increase of rock sample size,and the peak strength,peak strain,residual strain,residual stress and fracture time decrease with the increase of rock sample size.Shale with different scales changes instantaneously from elastic deformation to brittle failure,and there is no obvious plastic yield section.Before failure,the deformation of shale is linear elastic deformation,and after fracture,it is tensile shear failure,but the shear angle is small,and it is within 10 degrees.The scale effect of shale strength and deformation parameters is caused by loading direction,bedding plane direction,mechanical properties of bedding plane and uneven distribution of micro defects.Based on Griffith micro-crack strength theory model,a new strength scale effect model for shale was obtained.The model is in good agreement with the test results and can accurately predict the strength of shale samples with different scales.Different mechanical parameters of shale rock mass correspond to different sizes of reasonable laboratory test rock samples,and when the height diameter ratio of rock sample is 2 and the length is more than 160 mm,the mechanical parameters of rock sample measured in the laboratory can be used to characterize the mechanical parameters of rock mass in the mine after field correction.The scale effect law of shale strength and deformation can be used to predict the fracture pressure,the deformation characteristics of wellbore during well drilling and the initiation and stable expansion pressure during fracturing.In the current volume fracturing operation,it is very beneficial to expand the fracturing scale of branch fractures along the bedding direction or for the large and thick shale reservoirs with extremely developed micro defects along the bedding direction,it can be considered to conduct the multi-cluster fracturing of vertical wells to fully release

the mechanical advantages of the bedding surface conducive to fracture expansion,so as to improve the productivity of shale gas wells.
Number of references: 23
Main heading: Shale
Controlled terms: Compression testing - Rock mechanics - Elastic deformation - Fracture - Hydraulic fracturing - Metamorphic rocks
Uncontrolled terms: Deformation Characteristics - Deformation parameter - Fracturing operations - Mechanical parameters - Scale effect modeling - Strength and deformation characteristics - Strong heterogeneities - Tri-axial compression tests
Classification code: 483.1 Soils and Soil Mechanics - 512.1.2 Petroleum Deposits : Development Operations - 951 Materials Science
Numerical data indexing: Size 1.60e-01m, Size 3.80e-02m
DOI: 10.13225/j.cnki.jccs.2019.1421
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

352. Effect of the Angle between Hydraulic Fracture and Natural Fracture on Shale Gas Seepage (*Open Access*)

Accession number: 20210209733682
Authors: Wang, Xiaoming (1, 2, 3); Chen, Junbin (2, 3); Zhu, Jianhong (2, 3); Gong, Diguang (2, 3)
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Source title: Mathematical Problems in Engineering
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Volume: 2020
Issue date: 2020
Publication year: 2020
Article number: 5136948
Language: English
ISSN: 1024123X
E-ISSN: 15635147
Document type: Journal article (JA)
Publisher: Hindawi Limited
Abstract: Fracturing technology is an effective measure to exploit shale gas and the fractures improve the seepage ability of shale reservoir after fracturing. In this paper, taking Chang 7 of Yanchang Formation as the study area, a double porosity seepage model considering natural fracture was established and it was solved by finite element method of COMSOL5.5; then, shale gas seepage was analyzed under different angles between hydraulic fracture and natural fracture finally. Meanwhile, angles between hydraulic fracture and natural fracture were optimized by analyzing both the reservoir pressure distribution and bottom hole flowing pressure. Also, a permeability experiment with liquid was conducted to verify the accuracy of the numerical simulation result. Both numerical simulation and permeability measurement experiment get a uniform result that the optimal angle between hydraulic fracture and natural fracture is 90°. Permeability is the highest, shale gas seepage rate is the fastest, bottom hole flowing pressure is the highest, and also it is beneficial to the desorption of adsorbed gas in the matrix system and then effectively supplements reservoir pressure and bottom hole flowing pressure. The research results will provide some theoretical guidance for fracturing design.
Number of references: 30
Main heading: Fracture
Controlled terms: Hydraulic fracturing - Numerical models - Petroleum reservoir engineering - Seepage - Shale gas - Gases
Uncontrolled terms: Effective measures - Flowing pressures - Fracturing design - Natural fracture - Permeability measurements - Research results - Reservoir pressures - Yanchang Formation
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 512.2 Natural Gas Deposits - 522 Gas Fuels - 921 Mathematics - 951 Materials Science
DOI: 10.1155/2020/5136948

Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

353. Influence of CO2 injection on the pore size distribution and petrophysical properties of tight sandstone cores using nuclear magnetic resonance (*Open Access*)

Accession number: 20201108280878
Authors: Zhao, Jinsheng (1, 2); Wang, Pengfei (1, 2); Zhang, Yanming (3, 4); Ye, Liang (3, 4); Shi, Yu (1, 2)
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Source title: Energy Science and Engineering
Abbreviated source title: Energy Sci. Eng.
Volume: 8
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Issue date: July 1, 2020
Publication year: 2020
Pages: 2286-2296
Language: English
E-ISSN: 20500505
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: CO2 injection has been proposed as an efficient method for enhanced oil recovery in low-permeability sandstone reservoirs. When CO2 is injected into such reservoirs, the petrophysical properties as well as the pore size distribution of tight formation can be altered due to the interactions between CO2, water, and rock minerals. In this work, CO2 is introduced into the water-saturated sandstone cores; nuclear magnetic resonance technique is then applied to obtain T2 spectrum of the sandstone cores before and after CO2 injection. The effect of CO2 injection on the pore size distribution is analyzed by comparing the obtained T2 spectrum. In addition, the change of petrophysical properties, that is, total porosity, porosity of the movable fluid, and permeability, are also discussed in this work. Test results show that after introducing CO2, the total volume of small pores is significantly increased. On the contrary, the total volume of medium pores decreases. In addition, the immovable fluid porosity increases in the small pores, while it decreases in the medium pores after injecting CO2. Based on the composition analysis, the concentration of the ions of Na+, K+, Ca2+, and Mg2+ increases in the produced fluid due to the interactions between CO2 and albite, and potash feldspar. After CO2 injection, the total porosity, movable fluid porosity, and permeability of these tight cores are significantly improved. This study is expected to be significant for understanding the mechanisms of alterations of petrophysical properties and pore size distribution of tight sandstone cores due to the CO2 flooding. © 2020 Xi'an Shiyou University. Energy Science & Engineering published by the Society of Chemical Industry and John Wiley & Sons Ltd.
Number of references: 56
Main heading: Pore size
Controlled terms: Potash - Magnetism - Nuclear magnetic resonance - Petroleum reservoir engineering - Size distribution - Carbon dioxide - Feldspar - Sandstone
Uncontrolled terms: Composition analysis - Enhanced oil recovery - Low-permeability sandstone reservoirs - Movable fluid porosity - Nuclear magnetic resonance techniques - Petrophysical properties - Tight sandstones - Water-saturated sandstones
Classification code: 482.2 Minerals - 512.1.2 Petroleum Deposits : Development Operations - 701.2 Magnetism: Basic Concepts and Phenomena - 804.2 Inorganic Compounds - 922.2 Mathematical Statistics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1002/ese3.663
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Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

354. Analysis of tensile properties of N80Q steel and 80SH steel

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Authors: Chen, Yang (1); Wang, Hang (2); Yang, Shangyu (2); Wei, Wenlan (3); Luo, Sheji (1); Han, Lihong (2)
Author affiliation: (1) College of Material Science and Engineering School, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) CNPC Tubular Goods Research Institute, State Key Laboratory of Performance and Structural Safety for Petroleum Tubular Goods and Equipment Materials, Xi'an; Shaanxi; 710077, China; (3) College of Mechanical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Source title: Materials Science Forum
Abbreviated source title: Mater. Sci. Forum
Volume: 993 MSF
Part number: 1 of 1
Issue title: Functional and Functionally Structured Materials IV
Issue date: 2020
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Pages: 610-615
Language: English
ISSN: 02555476
E-ISSN: 16629752
CODEN: MSFOEP
ISBN-13: 9783035715668
Document type: Conference article (CA)
Conference name: 20th Chinese Materials Conference, CMC 2019
Conference date: July 10, 2019 - July 14, 2019
Conference location: Chengdu, China
Conference code: 240909
Publisher: Trans Tech Publications Ltd
Abstract: During heavy oil production, the performance of casing varies with temperature in the service environment. The tensile test of N80Q Steel and 80SH Steel were carried out to evaluate the mechanical properties during the service. The results indicated that the grain size of 80SH steel was relatively uniform and the grain boundary was relatively obvious compared with N80Q steel. A qualitative analysis was performance by relating the tensile properties with different temperature. The results showed that the yield strength, the tensile strength and elongation of N80Q and 80SH steels decreased with increasing temperature, but the degree of decline was limited. The observation of the tensile fracture revealed that the characteristics of the radiation zone of N80Q steel were obvious compared with 80SH steel at 20°C. © 2020 Trans Tech Publications Ltd, Switzerland.
Number of references: 11
Main heading: Tensile strength
Controlled terms: Tensile testing - Heavy oil production - Thermal oil recovery - Grain boundaries - Crude oil
Uncontrolled terms: Grain size - Increasing temperatures - Qualitative analysis - Radiation zones - Service environment - Strength and elongations - Tensile fractures
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits
Numerical data indexing: Temperature 2.93e+02K
DOI: 10.4028/www.scientific.net/MSF.993.610
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

355. Wringing effect prevention on a piston design in a downhole drilling tool

Accession number: 20210109729644
Authors: Li, Fei (1, 2); Gao, Rui (3, 4)

Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an, Shaanxi, China; (2) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, Xi'an Shiyou University, Xi'an, Shaanxi, China; (3) Enn Science and Technology Development Co. Ltd, Langfang, Hebei, China; (4) Hebei Technology Innovation Centre of Deep Geothermal Energy, Langfang, Hebei, China
Corresponding author: Gao, Rui(gaoruig@enn.cn)
Source title: Journal of Engineering
Abbreviated source title: J. Eng.
Volume: 2020
Issue: 12
Issue date: December 1, 2020
Publication year: 2020
Pages: 1171-1176
Language: English
E-ISSN: 20513305
Document type: Journal article (JA)
Publisher: Institution of Engineering and Technology
Abstract: This research studied the wringing effect present on a piston with two contact surfaces in a downhole tool and investigated piston design guidance to prevent this occurrence. A piston on the downhole drilling tool is designed to be moved by hydraulic forces on-demand in downhole operation. The piston failed to move during an experiment at a depth of 8772 m in an oil drilling well located in the Gulf of Mexico. The wringing effect was suspected as the root cause of this failure, and subsequent laboratory experiments confirmed that wringing presence caused non-functional piston. Then, potential influencing factors causing wringing effects were analysed and investigated in a series of laboratory experiments aiming to eliminate the wringing adhesive force between the contact surface of the piston and its mandrel. The investigated factors included the roughness and area of the contact surfaces and pre-compression force. Based on the findings, the piston design was optimised and re-tested, and it was found that the optimised piston eliminated wringing adherence. With experimental data, semi-empirical design guidance regarding the influencing factors was summarised for critical piston design to eliminate possible wringing. © 2020 Institution of Engineering and Technology. All rights reserved.
Number of references: 16
Main heading: Pistons
Controlled terms: Infill drilling - Adhesives
Uncontrolled terms: Contact surface - Design guidance - Down-hole drilling - Downhole operation - Hydraulic force - Laboratory experiments - Pre-compression - Semi-empirical
Classification code: 511.1 Oil Field Production Operations - 612.1.1 Internal Combustion Engine Components
Numerical data indexing: Size 8.77e+03m
DOI: 10.1049/joe.2020.0132
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

356. System Fault Diagnosis Method Based on OSDG Model (*Open Access*)

Accession number: 20203209006702
Authors: Cong, Wei (1); Yu, Hongkun (2); Liu, Jing (1)
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1575
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Issue: 1
Issue title: 5th Annual International Conference on Information System and Artificial Intelligence, ISAI 2020
Issue date: July 13, 2020
Publication year: 2020
Article number: 012206
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)

Conference name: 2020 5th Annual International Conference on Information System and Artificial Intelligence, ISAI 2020
Conference date: May 22, 2020 - May 23, 2020
Conference location: Zhejiang, China
Conference code: 161784
Publisher: Institute of Physics Publishing
Abstract: For the difficulties of cross-link fault diagnosis in complex systems, a fault diagnosis method based on optimised signed directed graph model is proposed. First, the system structure is layered and the control bridge is used to implement a top-down hierarchical structure. The SDG is used to describe the hierarchical structure of the system, and the SDG model is also layered so the fault information is propagated unidirectionally according to the layer. The reverse search strategy based on the fault propagation matrix is used to judge the compatible path, obtain the set of candidate fault sources, use the use availability to objectively evaluate the impact of multiple fault sources to improve the efficiency of troubleshooting. The example analysis shows that the method in this paper can adapt to the fault diagnosis needs of complex systems, and has practical application value for shortening the time of system fault determination and improving the accuracy of troubleshooting. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Failure analysis
Controlled terms: Directed graphs - Fault detection
Uncontrolled terms: Fault diagnosis method - Fault propagation - Hierarchical structures - Multiple faults - Reverse search - Signed directed graph - System faults - System structures
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.1088/1742-6596/1575/1/012206
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

357. System-level fault diagnosis method based on test model (*Open Access*)

Accession number: 20204009290314
Authors: Cong, Wei (1); Hongkun, Yu (2); Liu, Jing (1)
Author affiliation: (1) School of Information Engineering, Xijing University, Xi'an; 710023, China; (2) Department of Continous Education, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Cong, Wei(congweicw@126.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1629
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Issue title: 2020 2nd International Conference on Applied Machine Learning and Data Science, ICAMLDS2020
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Publication year: 2020
Article number: 012088
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E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 2nd International Conference on Applied Machine Learning and Data Science, ICAMLDS2020
Conference date: August 21, 2020 - August 23, 2020
Conference location: Chengdu, China
Conference code: 162960
Publisher: IOP Publishing Ltd
Abstract: Aiming at the problems of many test states and uncertain test results in system-level fault diagnosis, a system-level fault diagnosis method based on test model is proposed. This method first divides the system nodes into multiple regions, then hierarchically organizes the regions, and implements a top-down hierarchical structure through the control nodes. On this basis, the guide words are used to describe system-level failure modes, formulate centralized test rules, and use data flows to identify failure modes caused by fault propagation and fault mutation, which reduces the state of fault testing and improves the accuracy of fault diagnosis. The example analysis shows that the method in this paper can meet the needs of system-level fault diagnosis, and has practical application value for

shortening the time of system fault determination and improving the accuracy of troubleshooting. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Failure analysis
Controlled terms: Data flow analysis - Testing - Fault detection
Uncontrolled terms: Fault propagation - Fault testing - Hierarchical structures - Multiple regions - System faults - System levels - System-level fault diagnosis - Test Modeling
DOI: 10.1088/1742-6596/1629/1/012088
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

358. Effects of molecular sieves on the catalytic pyrolysis of oily sludge

Accession number: 20204909579163
Authors: Yu, Tao (1, 2); Hu, Haijie (1, 2); Wang, Feifei (1); Qu, Chengtun (1, 2, 3); Li, Jinling (1, 2); Yang, Bo (1, 2)
Author affiliation: (1) School of Chemistry & Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Environmental Pollution Control Technology and Reservoir Protection of Oilfield, Xi'an Shiyou University, Xi'an; 710065, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing; 102206, China
Corresponding authors: Qu, Chengtun(xianquct@163.com); Qu, Chengtun(xianquct@163.com); Qu, Chengtun(xianquct@163.com)
Source title: UPB Scientific Bulletin, Series B: Chemistry and Materials Science
Abbreviated source title: UPB Sci Bull Ser B
Volume: 82
Issue: 4
Issue date: 2020
Publication year: 2020
Pages: 133-146
Language: English
ISSN: 14542331
E-ISSN: 22863680
CODEN: SBPSFZ
Document type: Journal article (JA)
Publisher: Politechnica University of Bucharest
Abstract: To improve the pyrolysis efficiency of oily sludge, a molecular sieve catalyst (Al-MCM-41) was synthesized by the impregnation method. The effects of different temperatures and catalyst concentrations on the pyrolysis products were studied. The results showed that the oil recovery rate reached 83.48% after pyrolysis at 430°C for 3 h at a Si/Al ratio of 60 and a catalyst dosage of 1%. Thus, the catalytic pyrolysis improves the recovery of light oil components and promotes the pyrolysis of oily sludge. © 2020, Politechnica University of Bucharest. All rights reserved.
Number of references: 20
Main heading: Molecular sieves
Controlled terms: Pyrolysis - Catalysts - Crude oil - Sieves
Uncontrolled terms: Catalyst concentration - Catalytic pyrolysis - Impregnation methods - Molecular sieve catalysts - Oil recoveries - Oily sludges - Pyrolysis products - Si/Al ratio
Classification code: 512.1 Petroleum Deposits - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally
Numerical data indexing: Percentage 1.00e+00%, Percentage 8.35e+01%, Temperature 7.03e+02K, Time 1.08e+04s
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

359. Experimental investigation of turbulence characteristics in stirred tank with polymer as drag reducing agent using particle image velocimetry (*Open Access*)

Accession number: 20203809189464
Authors: Quan, Qing (1, 2); Chen, Yiming (3); Gao, Zhimin (1, 2); Qi, Xueyu (3); Wang, Shouxi (1, 2)
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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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Issue title: 2020 6th International Conference on Advances in Energy, Environment and Chemical Engineering - Principles of Chemistry and Materials Science
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Document type: Conference article (CA)
Conference name: 2020 6th International Conference on Advances in Energy, Environment and Chemical Engineering, AEECE 2020
Conference date: June 19, 2020 - June 21, 2020
Conference location: Jinan, Vitual, China
Conference code: 162297
Publisher: IOP Publishing Ltd
Abstract: The effect of polymer concentration on turbulence flow field was analyzed by particle image velocimetry inside a stirred tank. With the increment of polymer concentration, the velocity gradient in the radial direction increased and the TKE and EDR rapidly decreased in the impeller region, while the velocity gradient decreased in the axial direction and the TKE and EDR first increased and then decreased in the region close to the wall. Higher polymer concentration resulted in lower turbulence intensity both in the radial and axial velocity components attributing to the weakened and restrained fluctuation intensity of the long-chain in the drag reducer polymer. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Velocity measurement
Controlled terms: Velocimeters - Tanks (containers) - Drag reduction - Flow visualization - Turbulence
Uncontrolled terms: Axial velocity component - Drag reducing agents - Experimental investigations - Fluctuation intensity - Particle image velocimetries - Polymer concentrations - Turbulence characteristics - Turbulence flow fields
Classification code: 619.2 Tanks - 631.1 Fluid Flow, General - 943.3 Special Purpose Instruments
DOI: 10.1088/1755-1315/546/4/042021
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Funding text: Authors wishing to acknowledge assistance from the National Natural Science Foundation of China (51704236).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

360. Numerical Simulation Research on Reflected Wave Characteristics of Oil and Gas Well Coupling (*Open Access*)

Accession number: 20203809182383
Authors: Wang, Ke (1); Liu, Yanping (2); Wu, Jie (2); Gao, Jianshen (2)

Author affiliation: (1) Yanchang Oil Field Co., Ltd. Yan'an, Shaanxi; 716000, China; (2) Departments of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Yanping(liuyp@xsyu.edu.cn)
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Conference name: 2020 2nd International Conference on Electronic Engineering and Informatics, EEI 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Lanzhou, China
Conference code: 162560
Publisher: Institute of Physics Publishing
Abstract: In order to analyse and identify the reflection morphology of the coupling reflected wave in the oil jacket annulus and to clarify the influences of different factors on the coupling reflection waveform, the COMSOL finite element analysis software is used to conduct a numerical simulation study on the above situation, and the response characteristics are obtained by calculation. In this paper, different signal sources are used to research the three-dimensional propagation characteristics of acoustic wave when it meets the coupling in the annular space. Numerical simulations are carried out for different coupling thicknesses, different coupling radii, and different oil casing annulus pressures to analyse their influences on the waveform of coupling wave. The results showed that when the polarity of the signal source was positive (negative), the coupling reflection signal was positive (negative) at first and then negative (positive). When the signal source is a positive-negative superimposed source, the first peak polarity of the coupling reflection signal is consistent with the signal source. The reflected signal is superimposed by the response generated by the positive and negative signal sources, respectively. With the increase of the coupling radius, the morphology of coupling wave remains unchanged while its reflected wave amplitude increases nonlinearly with the increase of the coupling radius; with the increase of the oil casing annulus pressure, the morphology of coupling wave does not change, but the amplitude of the reflected wave increases linearly with the increase of the pressure; as the thickness of the coupling increases, the peak-to-peak spacing of the coupling reflection wave becomes larger and the positive and negative peaks separate. The research results can provide theoretical basis and reference standards for the analysis of the characteristics of the signals received by the actual fluid level detector, the performance verification of the echo signal processing method and the correct identification of the dynamic fluid level position.
Number of references: 11
Main heading: Numerical models
Controlled terms: Acoustic wave propagation - Morphology - Computer software - Signal processing
Uncontrolled terms: Echo signal processing - Finite element analysis software - Numerical simulation research - Numerical simulation studies - Performance verification - Propagation characteristics - Reference standard - Response characteristic
Classification code: 716.1 Information Theory and Signal Processing - 723 Computer Software, Data Handling and Applications - 751.1 Acoustic Waves - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1088/1742-6596/1617/1/012090
Funding Details: Number: 2018JQ4008,2018JQ4045, Acronym: -, Sponsor: -; Number: 41704106,41804115, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 19JK0665, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This research was financially supported byNational Natural Science Foundation of China(Program No. 41704106,41804115),The Project Supported by Natural Science Basic Research plan in Shaanxi Province of China(Program No. 2018JQ40452018JQ4008),and Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 19JK0665).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex

Data Provider: Engineering Village

361. Transmission synthesis scheme for a multicast system with unknown locations of eavesdroppers

Accession number: 20204709501459
Title of translation:
Authors: Gao, Jianbang (1, 2); Yuan, Zhaohui (1); Zhou, Jing (2)
Author affiliation: (1) School of Automation, Northwestern Polytechnical University, Xi'an; 710072, China; (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Xi'an Dianzi Keji Daxue Xuebao/Journal of Xidian University
Abbreviated source title: Xi'an Dianzi Keji Daxue Xuebao
Volume: 47
Issue: 5
Issue date: October 20, 2020
Publication year: 2020
Pages: 144-149
Language: Chinese
ISSN: 10012400
CODEN: XDKXEP
Document type: Journal article (JA)
Publisher: Science Press
Abstract: In order to solve the problem of multicast wireless secure communication with unknown locations of the eavesdroppers, a secure communication synthesis scheme was proposed based on the frequency diverse arrays. By studying the frequency diverse arrays model and analyzing the beam pattern, a random frequency diverse array is constructed at the transmitter. At the same time, combined with the added artificial noise baseband signal processing method, the maximizing artificial noise energy method is designed to optimize the beamforming weighted vector of each multicast group, so as to improve the security performance of the multicast system. Numerical results show that the scheme realizes secure communication of a multicast system and can precisely control the signal energy received by legitimate users. © 2020, The Editorial Board of Journal of Xidian University. All right reserved.
Number of references: 15
Main heading: Secure communication
Controlled terms: Signal processing - Multicasting
Uncontrolled terms: Artificial noise - Baseband signal processing - Communication synthesis - Multicast groups - Multicast systems - Numerical results - Random frequency - Security performance
Classification code: 716 Telecommunication; Radar, Radio and Television - 716.1 Information Theory and Signal Processing - 717 Optical Communication - 718 Telephone Systems and Related Technologies; Line Communications
DOI: 10.19665/j.issn1001-2400.2020.05.019
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

362. 2D-key-points-localization-driven 3D aircraft pose estimation (*Open Access*)

Accession number: 20211210121408
Authors: Li, Yibo (1); Yu, Ruixing (1); Zhu, Bing (2)
Author affiliation: (1) School of Astronautics, Northwestern Polytechnical University, Xi'an; 710072, China; (2) School of Electronic Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Yu, Ruixing(yrxgigi@nwpu.edu.cn)
Source title: IEEE Access
Abbreviated source title: IEEE Access
Volume: 8
Issue date: 2020
Publication year: 2020
Pages: 181293-181301
Language: English
E-ISSN: 21693536
Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: In this paper, we are interesting in inferring 3D pose estimation of aircraft object leveraging 2D key-points localization. Monocular vision based pose estimation for aircraft can be widely utilized in airspace tasks like flight control system, air traffic management, autonomous navigation and air defense system. Nonetheless, prior methods using directly regression or classification can not meet the requirements of high precision in aircraft pose estimation context, other approaches using PnP algorithms that need additional information such as template 3D model or depth as prior knowledge. These methods do not exploit to full advantage the correlation information between 2D key-points and 3D pose. In this paper, we present a multi-branch network, named AirPose network, using convolutional neural network to address 3D pose estimation based on 2D key-points information. In the meantime, a novel feature fusion method is explored to enable orientation estimation branch adequately exploit key-points information. Our feature fusion method significantly decreases 3D pose estimation error also avoids the involvement of RANSAC based PnP algorithms. To address the problem that there is no available dedicated aircraft 3D pose dataset for training and testing, we build a visual simulation platform on Unreal Engine 4 applying domain randomization (DR) skill, named AKO platform, which generates aircraft images automatically labeled with 3D orientation and key-points location. The dataset is called AKO dataset. We implement a series of ablation experiments to evaluate our framework for aircraft object detection, key-points localization and orientation estimation on AKO dataset. Experiments show that our proposed AirPose network leveraging AKO dataset can achieve convincing results for each of the tasks.
Number of references: 49
Main heading: Classification (of information)
Controlled terms: 3D modeling - Simulation platform - Convolution - Convolutional neural networks - Flight control systems - Three dimensional computer graphics - Air navigation - Aircraft detection - Statistical tests - Object detection - Training aircraft
Uncontrolled terms: 3D pose estimation - Ablation experiments - Air Traffic Management - Autonomous navigation - Feature fusion method - Localization and orientation - Orientation estimation - Training and testing
Classification code: 431.5 Air Navigation and Traffic Control - 652.1 Aircraft, General - 652.3 Aircraft Instruments and Equipment - 716.1 Information Theory and Signal Processing - 716.2 Radar Systems and Equipment - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 731.1 Control Systems - 903.1 Information Sources and Analysis - 922.2 Mathematical Statistics
DOI: 10.1109/ACCESS.2020.3026209
Funding Details: Number: 17JK0599, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2020GY-047, Acronym: -, Sponsor: -; Number: 61101191, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported in part by the National Nature Science Foundation of China under Grant 61101191, in part by the Shaanxi Key Research and Development Plan under Grant 2020GY-047, and in part by the Special Scientific Research Project of Shaanxi Provincial Department of Education under Grant 17JK0599.
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

363. Study of the structure, electronic and optical properties of BiOI/Rutile-TiO2 heterojunction by the first-principle calculation (*Open Access*)

Accession number: 20200908228234
Authors: Qu, Zhan (1); Su, Yali (2); Sun, Li (1); Liang, Feng (1); Zhang, Guohe (1)
Author affiliation: (1) School of Microelectronics, Xi'an Jiaotong University, Xi'an; 710049, China; (2) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liang, Feng(fengliang@xjtu.edu.cn)
Source title: Materials
Abbreviated source title: Mater.
Volume: 13
Issue: 2
Issue date: January 1, 2020
Publication year: 2020
Article number: 323
Language: English
E-ISSN: 19961944
Document type: Journal article (JA)
Publisher: MDPI AG

Abstract: Using the first-principle calculation that is based on the density functional theory (DFT), our group gains some insights of the structural, electronic and optical properties of two brand new types of BiOI/TiO2 heterojunctions: 1I-terminated BiOI [001] surface/TiO2 (1I-BiOI/TiO2) and BiO-terminated BiOI [001] surface/TiO2 (BiO-BiOI/TiO2). The calculation illustrates that BiOI/TiO2 heterojunction has excellent mechanical stability, and it shows that there is a great possibility for the BiOI/TiO2 heterojunction to be used in visible-light range, hence the photocatalytic ability can be enhanced dramatically. Especially, from the calculation, we discovered that there are two specific properties: the band-gap of 1I-BiOI/TiO2 heterojunction reduces to 0.28 eV, and the BiO-BiOI/TiO2 semiconductor material changes to n-type. The calculated band offset (BOs) for 1I-BiOI/TiO2 heterojunction indicates that the interfacial structure contributes a lot to a suitable band alignment which can disperse the photo-generated carriers into the opposite sides of the interface, so this could effectively weaken the electron-hole recombination. Meanwhile, the built-in potential around the interface accelerates the movement of the photo-generated electron-hole pairs. We believe this is the reason that the BiOI/TiO2 material shows perfect photocatalytic performance. This paper can provide theoretical support for the related research, especially the further research of the BiOI-based material. © 2020 by the authors.
Number of references: 41
Main heading: Electronic structure
Controlled terms: Optical properties - Photocatalytic activity - Bismuth compounds - Density functional theory - Energy gap - Calculations - Mechanical stability - Heterojunctions
Uncontrolled terms: Band offsets - Electron-hole recombination - Electronic and optical properties - First principle calculations - First principles - Photocatalytic performance - Photogenerated electrons - Photoresponses
Classification code: 714.2 Semiconductor Devices and Integrated Circuits - 741.1 Light/Optics - 801.4 Physical Chemistry - 921 Mathematics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics
Numerical data indexing: Electron_Volt 2.80e-01eV
DOI: 10.3390/ma13020323
Funding Details: Number: 61701531, Acronym: -, Sponsor: -;
Funding text: Funding: This research was funded by the National Science Foundation for the Young Scholars of China (Grant No. 61701531).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

364. Effect of recombination process in femtosecond laser-induced modification on Ge crystal

Accession number: 20204909565362
Authors: Ju, Jia-Qi (1); Qin, Zi-Yao (1); Liu, Ju-Kun (1); Zhao, Hong-Wei (1); Huang, Yao-Qing (1); Hu, Rong-Rong (1); Wu, Hua (2)
Author affiliation: (1) College of Science, Shanghai Institute of Technology, Shanghai; 201418, China; (2) College of Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Ju-Kun(liujukun@126.com)
Source title: Chinese Physics B
Abbreviated source title: Chin. Phys.
Volume: 29
Issue: 11
Issue date: October 1, 2020
Publication year: 2020
Article number: 114208
Language: English
ISSN: 16741056
E-ISSN: 20583834
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: The dynamics of produced excited carriers under the irradiation of Ge crystal is investigated theoretically by using femtosecond laser pulse. A two-temperature model combined with the Drude model is also used to study the nonequilibrium carrier density, carrier and lattice temperatures, and optical properties of the crystal. The properties of the surface plasmon wave when excited are also studied. The influences of non-radiation and radiative recombination process on the photoexcitation of the semiconductor during pulse and the relaxation after the pulse are described in detail. The results show that the effects of Auger recombination on the nonequilibrium carrier density and optical

properties of the crystal and the properties of the surface plasmon polariton are great, whereas the effect of radiative recombination is extremely small. © 2020 Chinese Physical Society and IOP Publishing Ltd.
Number of references: 37
Main heading: Optical properties
Controlled terms: Optical lattices - Particle optics - Phonons - Photons - Carrier concentration - Laser pulses - Femtosecond lasers - Augers - Electromagnetic wave polarization - Surface plasmon resonance
Uncontrolled terms: Lattice temperatures - Non-equilibrium carriers - Radiative recombination - Radiative recombination process - Recombination process - Surface plasmon polaritons - Surface plasmon waves - Two Temperature Model
Classification code: 502.2 Mine and Quarry Equipment - 701.1 Electricity: Basic Concepts and Phenomena - 711 Electromagnetic Waves - 741.1 Light/Optics - 744.1 Lasers, General - 744.8 Laser Beam Interactions - 931.3 Atomic and Molecular Physics - 932.1 High Energy Physics
DOI: 10.1088/1674-1056/abbbe9
Funding Details: Number: 11804227, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Young Scientists Fund;
Funding text: Project supported by the Young Scientists Fund of the National Natural Science Foundation of China (Grant No. 11804227).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

365. A novel high-resolution resistivity imaging while drilling tool based on contactless coupling

Accession number: 20210209739498
Title of translation:
Authors: Li, Xin (1); Ni, Weining (1); Mi, Jintai (1); Kang, Zhengming (2); Yan, Lipeng (1); Song, Zhaohui (1)
Author affiliation: (1) SINOPEC Research Institute of Petroleum Engineering, Beijing; 100101, China; (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710300, China
Source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)
Abbreviated source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)
Volume: 44
Issue: 6
Issue date: December 20, 2020
Publication year: 2020
Pages: 46-52
Language: Chinese
ISSN: 16735005
Document type: Journal article (JA)
Publisher: University of Petroleum, China
Abstract: Micro-resistivity imaging method and scanning sensor was studied, and a corresponding novel high resolution resistivity imaging while drilling tool (ResImg) was proposed and implemented. Several oilfield trails are carried out to verify the new tool's feasibility and reliability. Based on the contact-free coupling resistivity measuring principle, the excitement of wellbore electric field and scanning scheme were analyzed. The electrode system were built, which consists of upper and lower transmitting focusing electrodes and three middle imaging electrodes. FEM simulation was used to determine the source distance and detection characteristics of the instrument. The longitudinal truth-value resolution off racture was close to the diameter of imaging electrode, and could perceive 5 mm fracture's response. High speed electronic system and multi-sensor combination were employed to detect micro resistivity signal and dynamic tool face while tool's rotating during drilling. In initial field trails, ResImg tool successfully obtained 128 sector resolution stratigraphic images. The resistivity curve while drilling was highly consistent with the wireline logging data and had a higher resolution, which could better distinguish the thin layer information. © 2020, Editorial Office of Journal of China University of Petroleum(Edition of Natural Science). All right reserved.
Number of references: 23
Main heading: Electrodes
Controlled terms: Stratigraphy - Infill drilling - Electric fields - Logging while drilling
Uncontrolled terms: Detection characteristics - Electrode systems - High resolution resistivities - High-speed electronics - Higher resolution - Resistivity curves - Resistivity imaging - Scanning sensors

Classification code: 481.1 Geology - 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 701.1 Electricity: Basic Concepts and Phenomena
Numerical data indexing: Size 5.00e-03m
DOI: 10.3969/j.issn.1673-5005.2020.06.006
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

366. Influence of fluid velocity on ultrasonic wave flowrate measurement accuracy and its calibration

Accession number: 20204209362350
Title of translation:
Authors: Jia, Huiqin (1); Wang, Chengyun (1); Dang, Ruirong (1)
Author affiliation: (1) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Chengyun(1273389684@qq.com)
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Abbreviated source title: Yi Qi Yi Biao Xue Bao
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Issue date: July 1, 2020
Publication year: 2020
Pages: 1-8
Language: Chinese
ISSN: 02543087
CODEN: YYXUDY
Document type: Journal article (JA)
Publisher: Science Press
Abstract: When the ultrasonic wave time difference method is used for flowrate measurement, the fluid velocity causes the ultrasonic wave refraction angle to change. If the ultrasonic wave refraction angle is still treated as a fixed value in the measurement calculation, the accuracy of flowrate measurement is affected. Firstly, the influences of fluid velocity on the propagation time and the horizontal component of the propagation displacement along the downstream flow or upstream flow of an ultrasonic wave are analyzed. It is found that the propagation time and the horizontal component of the propagation displacement of the ultrasonic wave are inversely proportional and positively proportional to the flow velocity, respectively, and the changing trend in the upstream flow is more evident than that in the downstream flow. Secondly, through analyzing the propagation characteristics of the ultrasonic wave in flowing medium, the relationship between the propagation time & horizontal component of the propagation displacement and flow velocity is obtained. The above relationship indirectly reflects that the flow velocity causes the deviation of ultrasonic wave propagation path. Finally, based on the conclusion that the ultrasonic wave deviation can change the ultrasonic wave refraction angle, the curve relationship between the tangent of the refraction angle and the propagation time of the ultrasonic wave is used to calibrate the flowrate measurement value. After calibration, the accuracy of flowrate measurement can be improved by 0.172 9%~1.623 3% with an average of 0.647 1%. It is also found that the higher the flowrate, the better the calibration effect. © 2020, Science Press. All right reserved.
Number of references: 17
Main heading: Flow velocity
Controlled terms: Calibration - Wave propagation - Ultrasonic refraction - Ultrasonic waves - Velocity
Uncontrolled terms: Fluid velocities - Influence of fluid - Measurement accuracy - Propagation characteristics - Propagation time - Refraction angles - Time-differences - Wave refraction
Classification code: 631 Fluid Flow - 753.1 Ultrasonic Waves - 943.2 Mechanical Variables Measurements
Numerical data indexing: Percentage 3.00e+00%
DOI: 10.19650/j.cnki.cjsi.J2006211
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

367. Research and application of horizontal well infill SAGD development technology for super heavy oil reservoirs

Accession number: 20203909217302
Authors: Tao, Liang (1); Li, Geng (2); Li, Lingduo (3); Xiaoyong, Chen (3)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, China; (2) University of Missouri, United States; (3) PetroChina Natural Gas Sales Guangdong Company, China
Source title: Proceedings - SPE Symposium on Improved Oil Recovery
Abbreviated source title: Proc SPE Symp Improv Oil Recovery
Volume: 2020-August
Part number: 1 of 1
Issue title: Society of Petroleum Engineers - SPE Improved Oil Recovery Conference 2020, IOR 2020
Issue date: 2020
Publication year: 2020
Report number: SPE-200389-MS
Language: English
CODEN: SSIPD6
ISBN-13: 9781613997055
Document type: Conference article (CA)
Conference name: SPE Improved Oil Recovery Conference 2020, IOR 2020
Conference date: August 31, 2020 - September 4, 2020
Conference location: Tulsa, OK, United states
Conference code: 162753
Publisher: Society of Petroleum Engineers (SPE)
Abstract: In order to find effective replacement technology for ultra-heavy oil reservoirs at the late stage of horizontal well cyclic steam injection, pilot test on infill steam-assisted gravity drainage (SAGD) development has been carried out in Xinjiang Oilfield, China. In this study, a fine reservoir geological model was built by combining numerical reservoir simulation with the pilot test to analyze the development mechanism of infill SAGD, and optimize the location of the infill SAGD well group, the infill timing, and the timing of horizontal well turning into production well, as well as the operational parameters of the infill SAGD during start-up phase and production phase. Also, the adjustment techniques at each stage have been worked out. The research results show that the reasonable development technical parameters of the infill SAGD are: the SAGD steam injection well is 5m above the original horizontal well, and the infilling time is after 7 to 8 cycles of steam injection of the original horizontal well; after infilling, the original horizontal well is converted into production well after 2 cycles of steam injection; the bottom hole dryness of steam is greater than 85%, and the production/ injection ratio is 1.22 and 1.23. The new technology is expected to increase the ultimate recovery factor by 30%-35%, and will have great reference significance for the development of similar super heavy oil reservoirs. © 2020, Society of Petroleum Engineers.
Number of references: 22
Main heading: Horizontal wells
Controlled terms: Injection (oil wells) - Petroleum reservoirs - Gasoline - Heavy oil production - Oil field development - Petroleum reservoir evaluation - Steam - Infill drilling - Crude oil
Uncontrolled terms: Development mechanisms - Development technology - Numerical reservoir simulations - Operational parameters - Research and application - Reservoir geological models - Steam-assisted gravity drainages - Super heavy oil reservoir
Classification code: 511.1 Oil Field Production Operations - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 523 Liquid Fuels
Numerical data indexing: Percentage 3.00e+01% to 3.50e+01%, Percentage 8.50e+01%, Size 5.00e+00m
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

368. Ice formation prediction and heat transfer analysis of LNG in serpentine tube under supercritical pressure

Accession number: 20194807753371
Authors: Bai, Junhua (1); Pan, Jie (1); Wang, Wei (2); Wang, Kai (1); Wu, Gang (1)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Jiangnan Design Institute of Machinery & Electricity, Guiyang; 550100, China
Corresponding author: Bai, Junhua(jhbai@xsyu.edu.cn)
Source title: International Journal of Thermal Sciences
Abbreviated source title: Int. J. Therm. Sci.
Volume: 149

Issue date: March 2020
Publication year: 2020
Article number: 106137
Language: English
ISSN: 12900729
CODEN: RGTHA7
Document type: Journal article (JA)
Publisher: Elsevier Masson s.r.l.
Abstract: A numerical model employing the SST k-ω turbulent model and Shell Conduction model is established to predict the ice layer formation and thermal performance of serpentine tube in submerged combustion vaporizer (SCV) under supercritical pressure. The affecting factors on the heat transfer and ice layer formation such as pressure and heat flux are analyzed. A new semi-empirical heat transfer correlation is proposed taking account of the flow acceleration, thermophysical properties, buoyancy force and geometrical factor on the serpentine tube of supercritical LNG. The simulation results reveal that: (1) the interactive effect of centrifugal force, chaotic mixing fluid and buoyancy force are implied from the complicated flow structure and thermal performance of LNG in serpentine tube, and the centrifugal force dominates on heat transfer in the bend region resulting from the strengthening of cross flow and rotational flow; (2) the deviation of thermal performance between ice layer formation or not becomes slighter in the bend region than that in the straight sections due to the interaction of flow acceleration, reverse flow and secondary flow; (3) pressure and heat flux exhibit significant effects on thermal performance and ice layer formation; (4) the semi-empirical heat transfer correlation proposed in present paper can predict the heat transfer of LNG in serpentine tube under supercritical pressure accurately. © 2019 Elsevier Masson SAS
Number of references: 46
Main heading: Heat flux
Controlled terms: Serpentine - Forecasting - Buoyancy - Ice - Tubes (components) - Thermodynamic properties - Oceanography
Uncontrolled terms: Heat transfer correlation - Ice formations - Serpentine tubes - Super-critical pressures - Thermal Performance
Classification code: 471.1 Oceanography, General - 482.2 Minerals - 619.1 Pipe, Piping and Pipelines - 641.1 Thermodynamics - 641.2 Heat Transfer - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1016/j.ijthermalsci.2019.106137
Funding Details: Number: 51774237, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-285, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 16JK1594, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

369. Research on ACO-BP Based Prediction Method of the Oilfield Production Stimulation Results

Accession number: 20203709168848
Authors: Hu, Hongtao (1); Wu, Juan (1); Guan, Xin (2)
Author affiliation: (1) Xi'an Shiyou University, School of Computer Science, Xi'an, Shaanxi, China; (2) Exploration and Development, Research Institute of Petroleum, Beijing, China
Source title: ICEIEC 2020 - Proceedings of 2020 IEEE 10th International Conference on Electronics Information and Emergency Communication
Abbreviated source title: ICEIEC - Proc. IEEE Int. Conf. Electron. Inf. Emerg. Commun.
Part number: 1 of 1
Issue title: ICEIEC 2020 - Proceedings of 2020 IEEE 10th International Conference on Electronics Information and Emergency Communication
Issue date: July 2020
Publication year: 2020
Pages: 240-243
Article number: 9152310
Language: English
ISBN-13: 9781728163123

Document type: Conference article (CA)
Conference name: 10th IEEE International Conference on Electronics Information and Emergency Communication, ICEIEC 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Beijing, China
Conference code: 162111
Sponsor: IEEE Beijing Section; Institute of Electrical and Electronics Engineers
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In the process of oilfield development, production stimulation is important to stabilize the oilfield production output. In order to accurately predict the results of stimulation, and reasonably plan the stimulation actions for the oilfield, this paper proposes a prediction model that uses the ant colony algorithm ACO to optimize the back propagation neural network (BP neural network). Using Matlab to conduct ACO-BP oil field stimulation results prediction model tests, the experimental results show that the model is effective in predicting oilfield stimulation outcome; and the prediction accuracy and stability of the model are better than those of BP and FA-BP network prediction models. © 2020 IEEE.
Number of references: 10
Main heading: Forecasting
Controlled terms: Planning - Backpropagation - Oil field development - Ant colony optimization - Neural networks
Uncontrolled terms: Ant colony algorithms - Back propagation neural networks - BP networks - BP neural networks - Oilfield production - Prediction accuracy - Prediction methods - Prediction model
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 723.4 Artificial Intelligence - 912.2 Management - 921.5 Optimization Techniques
DOI: 10.1109/ICEIEC49280.2020.9152310
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

370. Research on Multi-mode Auto-drilling Technology of AC Variable Frequency Rig

Accession number: 20214010986195
Authors: Shuguang, Liu (1); Wuyang, Chen (1); Xiaolong, Chen (2)
Author affiliation: (1) Huangshan University, School of Mechanical and Electrical Eng., Huangshan, China; (2) Xi'An Shiyou University, School of Mechanical Eng., Xi'an, China
Source title: Proceedings - 2020 7th International Conference on Information Science and Control Engineering, ICISCE 2020
Abbreviated source title: Proc. - Int. Conf. Inf. Sci. Control Eng., ICISCE
Part number: 1 of 1
Issue title: Proceedings - 2020 7th International Conference on Information Science and Control Engineering, ICISCE 2020
Issue date: December 2020
Publication year: 2020
Pages: 2125-2129
Language: English
ISBN-13: 9781728164069
Document type: Conference article (CA)
Conference name: 7th International Conference on Information Science and Control Engineering, ICISCE 2020
Conference date: December 18, 2020 - December 20, 2020
Conference location: Changsha, Hunan, China
Conference code: 171872
Sponsor: et al.; Hunan University; Hunan University of Humanities, Science and Technology; Swinburne University of Technology; Wayne State University; Xiamen University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In view of the fact that single mode auto-drilling can not meet the requirements of different targets and different drilling stages for automatic drilling, several kinds of auto-drilling technology in multi-mode are studied, including constant rate of penetration (ROP) control, constant weight on bit (WOB) control, constant pump pressure control, constant power control and constant torque control, and corresponding auto-drilling control systems are constructed respectively. In view of the complexity of drilling process and the difficulty in establishing mathematical model, the active disturbance rejection control (ADRC) strategy is proposed after analyzing the relationship among various factors affecting the drilling. The algorithm does not need the precise mathematical model of the control object, and can modify the control parameters in real time through self-learning. The experiment results show that the control

effect is good, the auto-drilling can be realized on the basis of multi-mode target, and the control algorithm is also universal. © 2020 IEEE.
Number of references: 10
Main heading: Disturbance rejection
Controlled terms: Infill drilling - Power control
Uncontrolled terms: Active disturbances rejection controls - Control constants - Drilling technology - Multi-mode auto-drilling - Multimodes - Oil-rigs - Rate of penetration - Single mode - Variable frequencies - Weight on bits
Classification code: 511.1 Oil Field Production Operations - 731 Automatic Control Principles and Applications - 731.3 Specific Variables Control
DOI: 10.1109/ICISCE50968.2020.00417
Funding text: ACKNOWLEDGMENT This research was supported by the project of school-enterprise cooperation practice education base in Anhui (2018sjjd079), the emergent engineering research and practice project in Anhui (2020xgkxm32), national innovation and entrepreneurship training program for college students (201910375042, 201910375009).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

371. An improved K-means algorithm for supplier evaluation and recommendation of purchase and supply platform (*Open Access*)

Accession number: 20204809524866
Authors: Li, Junting (1); Qiu, Wenwen (1); Li, Weigang (2)
Author affiliation: (1) Xi'an Shiyou University, School of Economics and Management, Xi'an, Shanxi, China; (2) Northwestern Polytechnical University, School of Software Xi'an, Shanxi, China
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1650
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Issue title: 2020 International Conference on Applied Physics and Computing, ICAPC 2020 - 2. Computational Science
Issue date: October 29, 2020
Publication year: 2020
Article number: 32165
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Applied Physics and Computing, ICAPC 2020
Conference date: September 12, 2020 - September 13, 2020
Conference location: Ottawa, ON, Canada
Conference code: 164590
Publisher: IOP Publishing Ltd
Abstract: Aiming at the problem of supplier evaluation and selection in B2B e-commerce, a supplier evaluation and recommendation method based on improved k-means algorithm is proposed. Firstly, this paper analyzes the supplier evaluation and recommendation ideas based on the purchase and supply platform, and proposes the data mining algorithm ideas of clustering analysis and AHP evaluation; secondly, K-means algorithm is proposed based on the data mining model, and the algorithm is optimized according to the data characteristics of the purchase and supply platform; finally, taking the business data of the industrial product purchase platform of the volume purchase network as an example, not only the effectiveness of the algorithm is verified, but also the clustering effect of the algorithm is good and the calculation speed is fast, which provides a practical and effective supplier evaluation and recommendation method for B2B trading website.
Number of references: 15
Main heading: Electronic commerce
Controlled terms: K-means clustering - Data mining - Sales
Uncontrolled terms: Clustering analysis - Data characteristics - Data mining algorithm - Improved K-Means algorithm - Industrial product - Recommendation methods - Supplier evaluation and selections - Supplier Evaluations

Classification code: 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 903.1 Information Sources and Analysis
DOI: 10.1088/1742-6596/1650/3/032165
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

372. Applied Research of NMR Movable Fluid Saturation in Development of Low Permeability Oilfield (*Open Access*)

Accession number: 20202208741713
Authors: Xingjun, Gao (1); Baoge, Cao (2); Yuanliu, Li (1); Ling, Xiao (2)
Author affiliation: (1) Hengshan Oil Production Plant, Yanchang Oilfield, Yulin, Shanxi; 719100, China; (2) Petroleum Engineering Institute, Xi'an Shiyou University, Xi'an, Shanxi; 710065, China
Corresponding author: Baoge, Cao(cbg1045@126.com)
Source title: E3S Web of Conferences
Abbreviated source title: E3S Web Conf.
Volume: 165
Part number: 1 of 1
Issue title: 2020 2nd International Conference on Civil Architecture and Energy Science, CAES 2020
Issue date: May 1, 2020
Publication year: 2020
Article number: 01001
Language: English
ISSN: 25550403
E-ISSN: 22671242
Document type: Conference article (CA)
Conference name: 2nd International Conference on Civil Architecture and Energy Science, CAES 2020
Conference date: March 20, 2020 - March 22, 2020
Conference location: Changchun, China
Conference code: 160037
Publisher: EDP Sciences
Abstract: In order to improve the production degree of reserves in low permeability oilfield, taking Chang 2 reservoir in Bailangcheng oil region as an example, the movable fluid saturation and its influencing factors were studied by using NMR and high speed centrifugal method, on this basis, the application of movable fluid saturation in low permeability oilfield development is studied. The results show that the pore radius of low permeability reservoir is large, the micro-fine throat is developed, the movable fluid mainly exists in the volume controlled by the throat, the saturation of the movable fluid is low, and the production is difficult. Based on the relationship between the movable fluid saturation and permeability, single well geological reserves and permeability, availability of reserves and remaining movable reserves are evaluated, and the key areas of oilfield development adjustment are determined. According to the movable fluid saturation, the reservoirs are classified to predict the theoretical development effect of the reservoir, and the actual development effect of the oilfield is evaluated by the ratio of the recoverable reserves and movable reserves predicted by the dynamic method, the adjustment space of oil field is analysed. The results of this paper have important reference value for the development policy and adjustment policy of low permeability reservoir. © The Authors, published by EDP Sciences, 2020.
Number of references: 24
Main heading: Low permeability reservoirs
Controlled terms: Oil wells - Proven reserves - Mechanical permeability - Petroleum reservoir engineering - Oil field development - Planning
Uncontrolled terms: Applied research - Centrifugal methods - Development effect - Development policies - Geological reserves - Low permeability - Recoverable reserves - Theoretical development
Classification code: 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 912.2 Management
DOI: 10.1051/e3sconf/202016501001
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

373. Adsorption and descaling of cellucotton and chitosan-modified bentonite for produced water (*Open Access*)

Accession number: 20202708902978
Authors: Yu, Tao (1, 2); Wang, Ying (1, 2); Qu, Chengtun (1, 2, 3); Li, Jinling (1, 2); Yang, Bo (1, 2)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Environmental Pollution Control Technology and Reservoir Protection of OilField, Xi'an Shiyou University, Xi'an; 710065, China; (3) State Key Laboratory of Petroleum Pollution Control, CNPC Research Institute of Safety and Environmental Technology, Beijing; 102206, China
Corresponding authors: Qu, Chengtun(xianquct@yeah.net); Qu, Chengtun(xianquct@yeah.net); Qu, Chengtun(xianquct@yeah.net)
Source title: American Journal of Biochemistry and Biotechnology
Abbreviated source title: Am. J. Biochem. Biotechnol.
Volume: 16
Issue: 2
Issue date: 2020
Publication year: 2020
Pages: 208-215
Language: English
ISSN: 15533468
E-ISSN: 15586332
Document type: Journal article (JA)
Publisher: Science Publications, 244, 5th Avenue # S-207,, New York, NY 10001, United States
Abstract: The compatibility of non-identical layers within the water present in the produced oil is poor and ion reactions in the oil mixed with water result in scale formation, thereby having a significant impact on oilfield safety production. In this study, methods for the descaling of produced water from different blocks were studied according to the quality characteristics of the produced water. Results show that scale was produced at a concentration of 94 mg/L when three-phase separated water and formation water were mixed at a volume ratio of 1:0.3. The flocculation performance was optimized when the pH of the mixed water sample was adjusted to 7.5 and addition amount of polyaluminium chloride and polyacrylamide was 80 and 3 mg/L, respectively. In addition, the mixed water sample was adsorbed and descaled using cellucotton and chitosan-modified bentonite. Results show that the method for treating the mixed water sample first with cellucotton followed by the chitosan-modified bentonite shows the optimal adsorption–flocculation performance, thereby reducing the concentration of scale in the treated water to 3 mg/L. © 2020 Tao Yu, Ying Wang, Chengtun Qu, Jinling Li and Bo Yang. This open access article is distributed under a Creative Commons Attribution (CC-BY) 3.0 license.
Number of references: 22
Main heading: Adsorption
Controlled terms: Chitosan - Water treatment - Ostwald ripening - Produced Water - Flocculation - Bentonite - Metal cleaning - Chlorine compounds
Uncontrolled terms: Flocculation performance - Formation water - Modified bentonites - Non-identical - Polyaluminium chloride - Quality characteristic - Safety production - Scale formation
Classification code: 445.1 Water Treatment Techniques - 452.3 Industrial Wastes - 482.2 Minerals - 802.3 Chemical Operations - 804.1 Organic Compounds
Numerical data indexing: Mass_Density 3.00e-03kg/m3, Mass_Density 8.00e-02kg/m3, Mass_Density 9.40e-02kg/m3
DOI: 10.3844/ajbbsp.2020.208.215
Funding Details: Number: 14JS087, Acronym: -, Sponsor: -; Number: 21376189, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by the National Natural Science Foundation of China (Grant No.21376189) and Special Scientific Research Project Foundation of the Science and Technology Department of Shaanxi Province (Grant No.14JS087).
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.

374. Model and control method of a downhole electromagnetic transmitter for EM-MWD system

Accession number: 20201508402109
Authors: Liu, Keman (1)
Author affiliation: (1) Key Laboratory of Photoelectric Logging and Detecting of Oil and Gas, Ministry of Education, Xi'an Shiyou University, Xi'an; 710065, China
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 192
Issue date: September 2020
Publication year: 2020
Article number: 107210
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Downhole electromagnetic transmitter is an important part of EM-MWD system, which can send low-frequency EM waves data from a downhole tool to surface in real time for oil and gas exploration. In order to reduce the volume and weight of the downhole electromagnetic transmitter and improve the depth and accuracy of petroleum exploration, a novel downhole electromagnetic transmitter topology for electromagnetic MWD system is designed. Aiming at the complex and changeable characteristics of load impedance of transmitter, an equivalent load model for downhole electromagnetic transmitter is established with drill string, casing, drill-bit, drilling fluid and formation being taken into account. Because the attenuation characteristic of electromagnetic signal in the wellbore is similar to that of capacitor discharge, the characteristic of electromagnetic channel can be equivalent to the combination of capacitance and resistance. Then, in order to ensure that the downhole electromagnetic transmitter will produce the nominal load voltage, irrespective of disturbances such as variations in the lithium batteries voltage, perturbations in the switching times, and the load, a dual-loop real-time feedback control scheme with an outer voltage loop and an inner current loop is proposed. Simulation and experimental results with laboratory prototype demonstrate the effectiveness of the control method for downhole electromagnetic transmitter. It also ensures the downhole electromagnetic transmitter's excellent stability and the accuracy of the established equivalent load model as well as its ability to meet the requirements of practical field deep exploration. The findings of our work can help for better understanding of approximate load model of downhole electromagnetic transmitter. Furthermore, it will be of great significance for designing control algorithm of downhole electromagnetic transmitter for different areas or boreholes, achieving the purpose of increasing transmission depth. The research results can be used to improve the design and optimization of electromagnetic MWD measurement system in the aspects of improving the control accuracy of the transmitter, saving energy and increasing the transmission depth. © 2020 Elsevier B.V.
Number of references: 33
Main heading: Infill drilling
Controlled terms: Offshore oil well production - Boreholes - Petroleum prospecting - Electric discharges - Electric inverters - Electromagnetic waves - Capacitance - Transmitters
Uncontrolled terms: Attenuation characteristics - Design and optimization - Electromagnetic channels - Electromagnetic signals - Equivalent load model - Modeling and control - Oil and gas exploration - Petroleum exploration
Classification code: 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 701.1 Electricity: Basic Concepts and Phenomena - 711 Electromagnetic Waves
DOI: 10.1016/j.petrol.2020.107210
Funding Details: Number: 14JS074, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: 2014K05- 45, Acronym: -, Sponsor: -; Number: 41774081, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2014BS10, Acronym: -, Sponsor: -;
Funding text: This work is supported by the National Natural Science Foundation of China under Grant (No. 41774081), Key laboratory project of Shaanxi Provincial Department of Education (No. 14JS074), Key Science and Technology Program of Shaanxi Province (No. 2014K05- 45) and Doctoral Innovation Fund of Xi'an Petroleum University (No. 2014BS10).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

375. A new description method of the position of combustion front in dry linear fire flooding process

Accession number: 20200808208109
Authors: Yuan, Shibao (1, 2); Jiang, Haiyan (1); Ren, Zongxiao (1); Wang, Hao (1); Zhang, Yupeng (1); Bai, Yu (1)
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Source title: International Communications in Heat and Mass Transfer
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Volume: 113
Issue date: April 2020
Publication year: 2020
Article number: 104530
Language: English
ISSN: 07351933
CODEN: IHMTDL
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The description methods of combustion front are required to be fast and accurate for in-situ combustion (fire flooding), and the current methods can't fully conform that requirement. However, the description method based on conventional data monitoring is a way to solve this problem. The experimental results of dry combustion indicates that the position of combustion front has a nearly linear correlation with the total acid numbers (TAN) of oil produced for in-situ combustion (ISC). Meanwhile, the tendency of pressure variation between neighboring air injection wells can determine the state and the time of combustion chamber connected in linear ISC process. Therefore, based on the relationship between TAN, injection pressure and combustion front, the acid numbers-pressure(ANP) method is establishedwhich is suitable for dry linear fire flooding. Further, this method is applied to the calculation of the position of the combustion front in HQ1 ISC pilot area in Xinjiang over the years. Compared with other methods, the ANP method can rapidly calculate the position of combustion front and confirm the connectivity of combustion chamber. In addition, the combination of the ANP and other method is a good solution to confirm the position of combustion front for dry linear ISC process. © 2020 Elsevier Ltd
Number of references: 18
Main heading: Floods
Controlled terms: Injection (oil wells) - Combustion chambers - Oil well flooding - In situ combustion
Uncontrolled terms: Combustion fronts - Data monitoring - Description method - Dry combustion - Injection pressures - Linear correlation - Pressure variations - Total acid number
Classification code: 511.1 Oil Field Production Operations - 521.1 Fuel Combustion - 654.2 Rocket Engines
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

376. Rock Image Automatic Annotation based on Deep Neural Network

Accession number: 20203809211590
Authors: Zhao, Huitao (1); Zhao, Xiaohui (1); Liu, Wenxiang (1); Wei, Junjie (2); Cheng, Guojian (2); Qiang, Xinjian (2)
Author affiliation: (1) Research Institute of Exploration and Development, Chang Qing Oil Field Branch, Pcl, China; (2) School of Computer Science, Xi'an Shiyou University, China
Source title: Proceedings of 2020 IEEE 5th Information Technology and Mechatronics Engineering Conference, ITOEC 2020
Abbreviated source title: Proc. IEEE Inf. Technol. Mechatronics Eng. Conf., ITOEC
Part number: 1 of 1
Issue title: Proceedings of 2020 IEEE 5th Information Technology and Mechatronics Engineering Conference, ITOEC 2020
Issue date: June 2020
Publication year: 2020

Pages: 1824-1828
Article number: 9141827
Language: English
ISBN-13: 9781728143224
Document type: Conference article (CA)
Conference name: 5th IEEE Information Technology and Mechatronics Engineering Conference, ITOEC 2020
Conference date: June 12, 2020 - June 14, 2020
Conference location: Chongqing, China
Conference code: 161902
Sponsor: Chengdu Global Union Academy 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 Harbin Section
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: The automatic image annotation is a technology that uses deep neural network to extract features from the input image, and finally converts it into text description. It is currently one of the hot researches of explainable artificial intelligence. The thin section image of rock is an important data source in the field of geological exploration and oil and gas development. It can reflect the microstructure inside the rock. However, in actual research, if you only rely on manual observation to extract features from hundreds of rock images, it will affect the research efficiency and take time and effort. This paper uses GoogLeNet model in the deep convolutional neural network to implement the feature extraction of rock images, and also uses the LSTM model in the deep recurrent neural network to convert the image features into text features, and finally converts the rock images into text descriptions. The automatic image annotation technology of rock images based on deep neural networks not only realizes a step of converting rock images into text, but also assists scholars in the field of petroleum geology to realize efficient research. © 2020 IEEE.
Number of references: 18
Main heading: Rocks
Controlled terms: Convolution - Deep neural networks - Image annotation - Image analysis - Petroleum prospecting - Convolutional neural networks
Uncontrolled terms: Automatic annotation - Automatic image annotation - Geological exploration - Image features - Input image - Research efficiency - Text feature - Thin section
Classification code: 461.4 Ergonomics and Human Factors Engineering - 512.1.2 Petroleum Deposits : Development Operations - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing
DOI: 10.1109/ITOEC49072.2020.9141827
Funding text: This work was supported by the demonstration research for Ordos basin large-scale low-permeability lithological strata reservoir in China under Grant No.2016ZX05050.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

377. Fabrication and characterization of ZrW2O8-Cf/E51 negative thermal expansion composite (*Open Access*)

Accession number: 20201208319979
Authors: Ju, Luyan (1); Zhang, Jianbing (1); Ma, Yuqin (2); Xia, Shengyong (1); Wei, Wenlan (1); Zhang, Yong (1)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, Xi'an City; 710065, China; (2) School of Mechano-Electronic Engineering, Xidian University, Xi'an; 710071, China
Source title: Materials Research Express
Abbreviated source title: Mater. Res. Express
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Issue date: 2020
Publication year: 2020
Article number: 015610
Language: English
E-ISSN: 20531591
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: ZrW2O8-Cf/E51 composite with a negative Coefficient of Thermal Expansion (CTE) was fabricated by a method combining mechanical stirring with ultrasonic vibration, then microstructures and properties of the composites were analyzed and summarized by scanning electron microscope (SEM), DIL 402 C thermal expansion tester and

electronic universal testing machine. The results showed that particles distribution defects and impregnation defects of carbon fibers would occur when the process parameters were not controlled properly. Long curing time and good fluidity of resin were beneficial for resin impregnating carbon fibers and bubbles overflow. However, for the ZrW2O8-Cf/E51 composites studied in this paper, long curing time and low viscosity could cause particle settling and accumulation. The experimental results confirmed that the CTE (about-0.52 × 10-6/°C) and tensile strength (about 440 MPa) of E51 resin were improved with the addition of carbon fibers and ZrW2O8 particles. © 2020 The Author(s). Published by IOP Publishing Ltd.
Number of references: 29
Main heading: Zirconium compounds
Controlled terms: Resins - Tensile strength - Carbon fibers - Fabrication - Scanning electron microscopy - Vibration analysis - Defects - Curing - Thermal expansion - Carbon fiber reinforced plastics
Uncontrolled terms: Fabrication and characterizations - Mechanical stirring - Microstructures and properties - Negative coefficients - Particles distribution - properties - Ultrasonic vibration - Universal testing machines
Classification code: 641.1 Thermodynamics - 802.2 Chemical Reactions - 804 Chemical Products Generally - 815.1.1 Organic Polymers - 817.1 Polymer Products - 951 Materials Science
Numerical data indexing: Pressure 4.40e+08Pa
DOI: 10.1088/2053-1591/ab6638
Funding Details: Number: 0104134010026, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 51974251,51905426,19JK0671, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: Original content from this work may be used under the terms of the . Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI. Scientific Research Program Funded by Shaanxi Provincial Education Department 19JK0671 National Natural Science Foundation of China https://doi.org/10.13039/501100001809 51905426 and 51974251 Young Teacher Research Project of Xi'an Shiyou University 0104134010026 yes 2020 The Author(s). Published by IOP Publishing Ltd Creative Commons Attribution 4.0 licence
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

378. Genetic mechanism and evolution characteristics of overpressure in the lower play at the southern margin of the Junggar Basin, northwestern China

Accession number: 20204409438185
Title of translation:
Authors: Zhang, Fengqi (1, 2); Lu, Xuesong (3); Zhuo, Qingong (3); Zhong, Hongli (4); Zhang, Pei (1); Wei, Chi (1); Liu, Wei (1)
Author affiliation: (1) College of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (2) Provincial Key Lab of Hydrocarbon Accumulation Geology, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China; (3) Research Institute of Petroleum Exploration and Development, PetroChina, Beijing; 100083, China; (4) College of Geology and Environment, Xi'an University of Science and Technology, Xi'an; Shaanxi; 710054, China
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Abbreviated source title: Oil Gas Geol.
Volume: 41
Issue: 5
Issue date: October 28, 2020
Publication year: 2020
Pages: 1004-1016
Language: Chinese
ISSN: 02539985
Document type: Journal article (JA)
Publisher: Editorial Department of Oil and Gas Geology
Abstract: Intensive tectonic compression during the late Himalayan resulted in overpressure of complex evolution history in the lower play at the southern margin of the Junggar Basin. Based on an integration of formation pressure with geological data, this study discusses the features of log responses and comprehensive compaction of sandstone and mudstone in the lower play of the study area. The genetic mechanisms of the overpressure in the play are identified in combination with modified overpressure recognition diagrams and paleo-tectonic stress measured by Kaiser effect. The evolution characteristics of these mechanisms and their contribution to the current overpressure are also quantitatively evaluated based on the numerical simulation of both tectonic stress and overburden on compaction.

The results show that horizontal tectonic compression is the main cause of the over-pressurized Qigu Formation in the lower play of the study area, followed by vertical disequilibrium compaction and overpressure transmission vertically along the faults and laterally in sandstone.The vertical disequilibrium compaction began to develop in certain parts of the study area since the Paleogene to the deposition of the Taxihe Formation. Its contribution to the presently over-pressurized Qigu Formation in the eastern Sikeshu Sag and the east part of the third row of structural belt in the play are 1.4% and 33.3%, respectively. The continuous tectonic compression in high intensity led to a rapid increase of overpressure in the lower play since the end of the Taxihe depositional period, with contributions of 65.8% and 50.8% respectively to the overpressure in the formation of the two locations. The overpressure transmission mechanism was initiated and accelerated in the deep reservoirs of the play since the end of the Dushanzi depositional period, especially the Quaternary, when anticlines and faults were formed. Its contributions to the overpressure of the formation in the two locations are 32.8% and 15.9%, respectively.
Number of references: 50
Main heading: Compaction
Controlled terms: Sandstone - Transmissions - Deposition - Faulting - Landforms
Uncontrolled terms: Complex evolutions - Evolution characteristics - Formation pressure - Genetic mechanism - Northwestern China - Overpressure transmissions - Tectonic compressions - Tectonic stress
Classification code: 481.1 Geology - 482.2 Minerals - 484.1 Earthquake Measurements and Analysis - 602.2 Mechanical Transmissions - 802.3 Chemical Operations
Numerical data indexing: Percentage 1.40e+00%, Percentage 1.59e+01%, Percentage 3.28e+01%, Percentage 3.33e+01%, Percentage 5.08e+01%, Percentage 6.58e+01%
DOI: 10.11743/ogg20200511
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

379. Large core-offset based in-fiber Michelson interferometer for humidity sensing

Accession number: 20200608133958
Authors: Sun, Haonan (1); Shao, Min (1); Han, Liang (1); Liang, Junjun (1); Zhang, Rong (1); Fu, Haiwei (1)
Author affiliation: (1) Key Laboratory of Photo Electricity Gas & Oil Logging and Detecting of Ministry of Education, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Sun, Haonan(shaomin@xsyu.edu.cn)
Source title: Optical Fiber Technology
Abbreviated source title: Opt. Fiber Technol.
Volume: 55
Issue date: March 2020
Publication year: 2020
Article number: 102153
Language: English
ISSN: 10685200
CODEN: OFTEFV
Document type: Journal article (JA)
Publisher: Academic Press Inc.
Abstract: A humidity sensor based on Michelson interferometer (MI) is proposed and demonstrated. The sensor achieves intermodal interference by a large core-offset between two single mode fibers (SMFs) through arc fusion splicing. Experimental results show the sensor with a length of 25 mm and core-offset of 50 μm exhibits a linear humidity sensitivity of -0.083 dB/%RH in the humidity range of 35–95 %RH, which is comparable to that of intensity-modulated humidity sensors with coating humidity sensitive materials. The temperature response and stability is also investigated, a linear temperature sensitivity of 9.5 pm/°C in the temperature range of 20–180 °C is obtained. The low manufacturing cost, easy fabrication and good stability make the sensor has great potential in many applications.
Number of references: 25
Main heading: Humidity sensors
Controlled terms: Michelson interferometers - Temperature sensors - Manufacture - Single mode fibers
Uncontrolled terms: Core-offset - Humidity sensitive - Humidity sensitivity - In-fiber - Intensity-modulated - Intermodal interferences - Linear temperature-sensitivity - Temperature response
Classification code: 443.2 Meteorological Instrumentation - 537.1 Heat Treatment Processes - 741.1.2 Fiber Optics - 913.4 Manufacturing - 941.3 Optical Instruments - 944.5 Temperature Measuring Instruments
Numerical data indexing: Size 2.50e-02m, Size 5.00e-05m
DOI: 10.1016/j.yofte.2020.102153

Funding Details: Number: YSC19112034, Acronym: -, Sponsor: -; Number: 61805197, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

380. Electronic properties of thermoelectric pbse2 compound by density functional theory method

Accession number: 20203008973987
Authors: Han, Manman (1); Fu, Jia (1); Liu, Xing (1, 2); Jiang, Tao (1)
Author affiliation: (1) Materials Science and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Materials Science and Engineering, Northwestern Polytechnical University, Xi'an; 710072, China
Corresponding author: Fu, Jia(fujia@xsyu.edu.cn)
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Issue title: Materials and Technology of Clean Energy
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Publication year: 2020
Pages: 136-141
Language: English
ISSN: 02555476
E-ISSN: 16629752
CODEN: MSFOEP
ISBN-13: 9783035716405
Document type: Conference article (CA)
Conference name: 2nd International Conference on Clean Energy Materials and Technology, ICCEMT 2019
Conference date: November 29, 2019 - December 1, 2019
Conference location: Suzhou, China
Conference code: 241589
Publisher: Trans Tech Publications Ltd
Abstract: Based on the first-principles calculation and the quasi-harmonic Debye model, the electronic and thermodynamic properties of CuCl2-type PbSe2 compound of a promising thermoelectric (TE) material are studied. According to the density of states (DOS) and the Mulliken electron population, it is found that the PbSe2 compound possesses weak metallic characterization, where the covalent bonding exists in PbSe2 compound and the ionic bonding exists between Pb and Se atoms. Besides, the Debye temperature decreases with the increase of temperatures at various pressures, and it shows the increasing tendency under the elevated pressure at certain temperatures. The Grüneisen constants increases with the increase of the temperature at various pressures, and it also decreases with increasing pressure at the given temperatures. The density functional theory (DFT) is used to obtain the parameters of the Debye temperature, the Grüneisen constant and thermal expansion coefficient, which are about 319.76 K, 2.42, and 8.41×10-5 K-1 at 0 GPa, which provides useful parameters and contributes to explore new potential TE materials in future. © 2020 Trans Tech Publications Ltd, Switzerland.
Number of references: 19
Main heading: Density functional theory
Controlled terms: Calculations - Copper compounds - Chlorine compounds - Chemical bonds - Electronic properties - Temperature - Thermal expansion - Lead compounds
Uncontrolled terms: Density functional theory methods - Electron population - Elevated pressure - First-principles calculation - Quasi-harmonic Debye model - Temperature decrease - Thermal expansion coefficients - Thermoelectric material
Classification code: 641.1 Thermodynamics - 801.4 Physical Chemistry - 921 Mathematics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 951 Materials Science
Numerical data indexing: Pressure 0.00e+00Pa, Temperature 3.20e+02K
DOI: 10.4028/www.scientific.net/MSF.999.136
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

381. Balancing strength and plasticity of dual-phase amorphous/crystalline nanostructured Mg alloys

Accession number: 20202808917441
Authors: Wang, Jia-Yi (1); Wang, Jia-Yi (2); Song, Hai-Yang (1); An, Min-Rong (1); Deng, Qiong (2); Li, Yu-Long (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, Hai-Yang(gsfshy@sohu.com); Li, Yu-Long(liyulong@nwpu.edu.cn)
Source title: Chinese Physics B
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Article number: 066201
Language: English
ISSN: 16741056
E-ISSN: 20583834
Document type: Journal article (JA)
Publisher: Institute of Physics Publishing
Abstract: The dual-phase amorphous/crystalline nanostructured model proves to be an effective method to improve the plasticity of Mg alloys. The purpose of this paper is to explore an approach to improving the ductility and strength of Mg alloys at the same time. Here, the effect of amorphous phase strength, crystalline phase strength, and amorphous boundary (AB) spacing on the mechanical properties of dual-phase Mg alloys (DPMAs) under tensile loading are investigated by the molecular dynamics simulation method. The results confirm that the strength of DPMA can be significantly improved while its excellent plasticity is maintained by adjusting the strength of the amorphous phase or crystalline phase and optimizing the AB spacing. For the DPMA, when the amorphous phase (or crystalline phase) is strengthened to enhance its strength, the AB spacing should be increased (or reduced) to obtain superior plasticity at the same time. The results also indicate that the DPMA containing high strength amorphous phase exhibits three different deformation modes during plastic deformation with the increase of AB spacing. The research results will present a theoretical basis and early guidance for designing and developing the high-performance dual-phase hexagonal close-packed nanostructured metals. © 2020 Chinese Physical Society and IOP Publishing Ltd.
Number of references: 46
Main heading: Molecular dynamics
Controlled terms: Balancing - Magnesium alloys - Plasticity - Metallic glass
Uncontrolled terms: Crystalline phase - Deformation modes - Hexagonal close packed - Molecular dynamics simulation methods - Nanostructured metals - Research results - Strength and plasticities - Tensile loading
Classification code: 531 Metallurgy and Metallography - 542.2 Magnesium and Alloys - 549.2 Alkaline Earth Metals - 601 Mechanical Design - 801.4 Physical Chemistry - 951 Materials Science
DOI: 10.1088/1674-1056/ab84d5
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

382. Unique reconstruction of the potential for the interior transmission eigenvalue problem for spherically stratified media

Accession number: 20201208330270
Authors: Wei, Zhaoying (1); Wei, Guangsheng (2)

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Corresponding author: Wei, Guangsheng(weimath@vip.sina.com)
Source title: Inverse Problems
Abbreviated source title: Inverse Probl
Volume: 36
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Article number: 035017
Language: English
ISSN: 02665611
E-ISSN: 13616420
CODEN: INPEEY
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: This work deals with the interior transmission eigenvalue problem for a spherically stratified medium supported in {x: |x| = r = b}, which can be formulated as-y″ + q(x)y = $_{\lambda}$ 2 y with boundary conditions y(0) = 0 = y′$_{(1)}$ cos(a#)-y(1) sin(a#)/$_{\lambda}$, where a = b/B with B being the size of the wave speed, measured by an integral. We provide a necessary and sufficient condition for the existence issue by giving a new method that allows unique reconstruction of a potential of this Sturm-Liouville problem from the spectrum of the problem and the set of the norming constants corresponding to the real eigenvalues when 0 © 2020 IOP Publishing Ltd.
Number of references: 28
Main heading: Eigenvalues and eigenfunctions
Controlled terms: Transmissions
Uncontrolled terms: Exponential type - Interpolation formulas - Mittag-Leffler expansion - Normalizing constants - Stratified media - Stratified medium - Sturm-Liouville problem - Transmission eigenvalue
Classification code: 602.2 Mechanical Transmissions
DOI: 10.1088/1361-6420/ab6e77
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

383. Influence of composition on the mechanical properties of metallic nanoglasses: Insights from molecular dynamics simulation

Accession number: 20204409441128
Authors: Ma, J.L. (1); Song, H.Y. (1); Wang, J.Y. (1, 2); Dai, J.L. (1, 2); Li, Y.L. (2)
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Corresponding authors: Song, H.Y.(gsfshy@sohu.com); Li, Y.L.(liyulong@nwpu.edu.cn)
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Article number: 165102
Language: English
ISSN: 00218979
E-ISSN: 10897550
CODEN: JAPIAU
Document type: Journal article (JA)
Publisher: American Institute of Physics Inc.
Abstract: The introduction of a glass-glass interface is an effective way to improve the plasticity of metallic glass. However, the strength-plasticity trade-off has not still been effectively overcome. Here, the effect of the composition on the mechanical properties and deformation behavior of the CuZr nanoglass (NG) is investigated under tensile loading by a molecular dynamics simulation. The results indicate that high-performance NGs can be obtained by adjusting the percentage of Cu atoms. There is a critical Cu content (i.e., 75%), which makes the NGs have both high strength

and high plasticity. The results show that with the increase in the Cu content, the deformation mechanism of the NGs changes from necking to uniform plastic deformation and then to the nucleation and the growth of the main shear band. Our results underscore the importance of the composition in the design and preparation of high-performance metallic glass. © 2020 Author(s).
Number of references: 50
Main heading: Metallic glass
Controlled terms: Molecular dynamics - Glass - Zircaloy - Copper - Economic and social effects - Plasticity
Uncontrolled terms: Cu content - Deformation behavior - Deformation mechanism - Glass interface - High plasticity - High strength - Molecular dynamics simulations - Tensile loading
Classification code: 531 Metallurgy and Metallography - 544.1 Copper - 801.4 Physical Chemistry - 812.3 Glass - 951 Materials Science - 971 Social Sciences
Numerical data indexing: Percentage 7.50e+01%
DOI: 10.1063/5.0020999
Funding Details: Number: YCS18211005, Acronym: -, Sponsor: -; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-827, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 19JK0672, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This work is supported by the National Natural Science Foundation of China (No. 11572259), the Natural Science Foundation of Shaanxi Province (No. 2019JQ-827), the Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 19JK0672), and the Program for Graduate Innovation Fund of Xi'an Shiyou University (No. YCS18211005).This work is supported by the National Natural Science Foundation of China (No. 11572259), the Natural Science Foundation of Shaanxi Province (No. 2019JQ-827), the Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 19JK0672), and the Program for Graduate Innovation Fund of Xian Shiyou University (No. YCS18211005).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

384. Hydrofining Process of Coal Tar Based on Four Kinds of Catalyst Grading

Accession number: 20202608873741
Authors: Niu, Menglong (1); Niu, Menglong (2); Ji, Panpan (1); Fan, Zheng (1); Yan, Yongli (1); Li, Dong (2); Li, Wenhong (2)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Xi'An Shiyou University, Xi'an; 710065, China; (2) School of Chemical Engineering, Northwest University, Xi'an; 710069, China
Corresponding author: Niu, Menglong(mlniu@xsyu.edu.cn)
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Pages: 6510-6517
Language: English
ISSN: 08870624
E-ISSN: 15205029
CODEN: ENFUEM
Document type: Journal article (JA)
Publisher: American Chemical Society
Abstract: Although the mechanism of coal tar hydrogenation technology has not been fully revealed, many enterprises have realized the industrialization of this technology through the reference of crude oil hydrogenation technology. Therefore, it will be very helpful for the development of this technology to present a research result close to industry. Based on four kinds of catalyst gradations, the hydrogenation experiments of different processes and a series of 1200 h long-term experiments were carried out in a four-tube fixed bed reactor with coal tar distillate (IBP $\approx$ 360 °C) as the raw material. First, based on the product composition of different reactor outlets, the composition changes and main reaction process of coal tar in four reactors were summarized. It was found that the reactions in the four reactions are different and related. The hydrogenation of olefins mainly takes place in the first reaction (230 °C, hydrofining guard catalyst and hydrodemetallization catalyst). Most of the oxygenated compounds were transformed in the second reactor (320 °C, hydrogenation catalyst I) but not completely. The hydrogenation of aromatics is mainly concentrated in the third and fourth reactors, but there are already signs of this reaction in the second reactor. Second, the influence of

different process conditions on the product properties and the material balance under different process conditions were summarized. Finally, the stability of the grading system is verified by the long-term experiments. Copyright © 2020 American Chemical Society.
Number of references: 40
Main heading: Coal
Controlled terms: Hydrogenation - Olefins - Coal tar - Grading - Catalysts - Chemical reactors
Uncontrolled terms: Composition changes - Hydrodemetallization - Hydrogenation catalyst - Hydrogenation of olefins - Long-term experiments - Oxygenated compounds - Process condition - Product composition
Classification code: 411.2 Coal Tar - 524 Solid Fuels - 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds
Numerical data indexing: Temperature 5.03e+02K, Temperature 5.93e+02K, Temperature 6.33e+02K, Time 4.32e+06s
DOI: 10.1021/acs.energyfuels.0c00641
Funding Details: Number: 2018GY-08, Acronym: -, Sponsor: -;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

385. A high-sensitivity liquid level sensor based on single-mode taper-thin core taper single-mode fiber structure

Accession number: 20203709165801
Authors: Shao, Min (1); Han, Liang (1); Liang, Junjun (1); Zhang, Rong (1); Gao, Hong (1)
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Source title: Measurement Science and Technology
Abbreviated source title: Meas. Sci. Technol.
Volume: 31
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Issue date: October 2020
Publication year: 2020
Article number: 105101
Language: English
ISSN: 09570233
E-ISSN: 13616501
CODEN: MSTCEP
Document type: Journal article (JA)
Publisher: Institute of Physics Publishing
Abstract: An optical in-fiber Mach-Zehnder interferometer based on thin core fiber for liquid level sensing is proposed and experimentally demonstrated. The sensor head is composed of a single-mode taper-thin core taper single-mode fiber structure constructed via fusion splicing. The operational principle relies on the sensitivity of intermodal interference to liquid level variation; this is achieved by employing tapers as couplers. Experimental results reveal that the transmission spectrum exhibits a linearly red-shift, with the liquid level changing from 0 to 15 mm, and achieves enhanced sensitivities of 0.6853 nm mm-1, 0.9062 nm mm-1, and 1.2416 nm mm-1 for liquid RIs of 1.3352, 1.3491, and 1.3698, respectively. A temperature assessment is conducted, which demonstrates that the maximum measurement error induced by temperature is-0.017 mm C-1, which indicates the sensor shows real potential for practical applications. © 2020 IOP Publishing Ltd.
Number of references: 34
Main heading: Single mode fibers
Controlled terms: Mach-Zehnder interferometers - Liquids - Red Shift - Sensitivity analysis
Uncontrolled terms: Enhanced sensitivity - Fusion splicing - High sensitivity - Intermodal interferences - Liquid level sensors - Operational principles - Thin-core fibers - Transmission spectrums
Classification code: 741.1 Light/Optics - 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 921 Mathematics - 941.3 Optical Instruments
Numerical data indexing: Size 0.00e+00m to 1.50e-02m

DOI: 10.1088/1361-6501/ab8dfd
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

386. Convergence and Interoperability for the Energy Internet: From Ubiquitous Connection to Distributed Automation (*Open Access*)

Accession number: 20205309698349
Authors: Wu, Ying (1); Wu, Yanpeng (2); Guerrero, Josep M. (2); Vasquez, Juan C. (3); Palacios-Garcia, Emilio J. (4); Li, Jiao (1)
Author affiliation: (1) Xi'An Shiyou University, Xi'an, China; (2) Energy Technology, Aalborg University, Aalborg, Denmark; (3) VILLUM Center for Research on Microgrids, Aalborg, Denmark; (4) KU Leuven, Leuven, Belgium
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Abbreviated source title: IEEE Ind. Electron. Mag.
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Article number: 9299401
Language: English
ISSN: 19324529
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Document type: Journal article (JA)
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The Energy Internet is proposed to enhance the collaborative utilization of distributed renewable energy resources; enable a flexible, customer-engaged energy transaction network; and achieve real-time balancing of supply and demand. This allows integrating advanced Internet of Things (IoT)-based architectures, information and communications technology (ICT)-based end-to-end digital energy chains; customer-centric energy efficiency programs; energy-aware, realtime platforms; and intelligent distributed control algorithms. © 2007-2011 IEEE.
Number of references: 50
Main heading: Internet of things
Controlled terms: Energy efficiency - Power management - Economics - Renewable energy resources
Uncontrolled terms: Distributed automation - Distributed renewable energy resources - Energy efficiency programs - Information and communications technology - Intelligent distributed control - Internet of Things (IOT) - Real-time platform - Supply and demand
Classification code: 525.1 Energy Resources and Renewable Energy Issues - 525.2 Energy Conservation - 525.3 Energy Utilization - 704.2 Electric Equipment - 722.3 Data Communication, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 971 Social Sciences
DOI: 10.1109/MIE.2020.3020786
Funding Details: Number: 25920, Acronym: -, Sponsor: Villum Fonden; Number: 51707158,61802301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 771116, Acronym: AAU, Sponsor: Aalborg Universitet;
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Compendex references: YES
Open Access type(s): All Open Access, Green
Database: Compendex
Data Provider: Engineering Village

387. Atomic simulation of interaction mechanism between dislocation and amorphous phase in dual-phase crystalline/amorphous Mg/MgAl alloys (*Open Access*)

Accession number: 20201608434143
Authors: Dai, J.L. (1); Song, H.Y. (1); An, M.R. (1); Wang, J.Y. (1); Deng, Q. (2); 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 author: Song, H.Y.(gsfshy@sohu.com)
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Article number: 135105
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ISSN: 00218979
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CODEN: JAPIAU
Document type: Journal article (JA)
Publisher: American Institute of Physics Inc.
Abstract: The introduction of the amorphous phase and crystalline-amorphous interface (CAI) is an efficient approach for enhancing the mechanical performance of the Mg-based composites. Here, the interaction behavior between dislocations and amorphous phase in the dual-phase crystalline/amorphous Mg/MgAl alloys is investigated under tensile loading by molecular dynamics simulation. The results indicate that when the amorphous phase orientation (i.e., the angle between the tensile direction and the normal direction of CAI) is 0°, the amorphous phase with a larger thickness ($\geq$ the critical value of 2.0 nm) can effectively prevent dislocation slips, and the plastic deformation of the alloys is dominated by the nucleation and growth of a new grain in the crystalline phase. The research also shows that, with the increase in the amorphous phase orientation from 0° to 90°, the deformation mechanism changes from dislocation activities to CAI slips and then again to the nucleation and movement of dislocations. The change in the deformation mode is attributed to the variation of the quasi-Schmid factor of the amorphous layer in different orientations of the amorphous phase. Moreover, some qualitative and quantitative analyses about the plastic deformation behavior of the dual-phase nanostructure Mg alloy are also presented. © 2020 Author(s).
Number of references: 52
Main heading: Nucleation
Controlled terms: Magnesium alloys - Molecular dynamics - Plastic deformation
Uncontrolled terms: Amorphous phase orientation - Crystalline-amorphous interfaces - Interaction mechanisms - Mechanical performance - Molecular dynamics simulations - Nucleation and growth - Plastic deformation behavior - Qualitative and quantitative analysis
Classification code: 542.2 Magnesium and Alloys - 549.2 Alkaline Earth Metals - 801.4 Physical Chemistry - 933.1.2 Crystal Growth
Numerical data indexing: Size 2.00e-09m
DOI: 10.1063/1.5143721
Funding Details: Number: 19JK0672, Acronym: -, Sponsor: -; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JM1013,2019JQ-827, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This work is supported by the National Natural Science Foundation of China (NNSFC) (No. 11572259), the Natural Science Foundation of Shaanxi Province (Nos. 2018JM1013 and 2019JQ-827), and the Scientific Research Program Foundation of Shaanxi Provincial Education Department (No. 19JK0672).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

388. Micro pore structure and water-flooding characteristics on tight sandstone reservoir

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Title of translation:
Authors: Huang, Xing (1, 2); Gao, Hui (1); Dou, Liangbin (1)
Author affiliation: (1) School of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs, Xi'an; 710065, China
Source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)
Abbreviated source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)
Volume: 44

Issue: 1
Issue date: February 20, 2020
Publication year: 2020
Pages: 80-88
Language: Chinese
ISSN: 16735005
Document type: Journal article (JA)
Publisher: University of Petroleum, China
Abstract: In this study, the micro pore structures of Chang 8 reservoir in Jiyuan Oilfield were investigated via thin slice analysis of cores, SEM, high pressure mercury penetration and NMR testing, and the classification criteria of the pore structures of the target reservoir were established. The relationship between micro-pore structure characteristics and oil displacement efficiency was further studied by selecting representative core samples of each reservoir type to conduct water-flooding displacement experiments with real microscopic sandstone models. The results shows that the primary pore type of Chang 8 reservoir is intergranular pore and feldspar dissolution pore, and the primary throat type is of curved lamellar throat. The pore structures of the target reservoir can be divided into three types(types, and), and their corresponding storage capacity and flow ability of the three types decrease successively from type I to type III. There are great differences among different reservoir types in terms of water-flooding type, oil displacement efficiency and distribution characteristics of the residual oil. The type reservoir is the main target for improved oil recovery in the future. There are many factors that affect oil displacement efficiency, among them the mobile fluid saturation is the most suitable parameter to reflect the relationship with oil displacement efficiency. It has been proven that the reservoir types classified by this method are accurate and adoptable, which can provide a basis for the effective exploration and development of Chang 8 reservoir.
Number of references: 26
Main heading: Reservoirs (water)
Controlled terms: Petroleum prospecting - Petroleum reservoir engineering - Efficiency - Floods - Oil well flooding - Pore structure - Feldspar - Sandstone - Textures
Uncontrolled terms: Classification criterion - Fluid saturations - Micro-pore structures - Oil-displacement efficiency - Tight sandstones
Classification code: 441.2 Reservoirs - 482.2 Minerals - 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 913.1 Production Engineering - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.3969/j.issn.1673-5005.2020.01.009
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

389. A concurrent weighted communication scheme for blockchain transaction

Accession number: 20203909247877
Authors: Li, Jiao (1); Chen, Li (2)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University, Xi'an, China; (2) University of Louisiana at Lafayette, Department of Computer Science, Lafayette, United States
Source title: IEEE INFOCOM 2020 - IEEE Conference on Computer Communications Workshops, INFOCOM WKSHPS 2020
Abbreviated source title: IEEE INFOCOM - IEEE Conf. Comput. Commun. Workshops, INFOCOM WKSHPS
Part number: 1 of 1
Issue title: IEEE INFOCOM 2020 - IEEE Conference on Computer Communications Workshops, INFOCOM WKSHPS 2020
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Document type: Conference article (CA)
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Conference date: July 6, 2020 - July 9, 2020
Conference location: Toronto, ON, Canada
Conference code: 162346

Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: Blockchain technology is a new distributed infrastructure and computing mode in recent years, and it provides a distributed data management solution for storage, authentication, transfer and exchange. In order to shorten the confirmation time of block data transaction and improve the processing capacity of blockchain, it is necessary to solve the problem of data communication performance optimization in blockchain transaction validation. This paper proposes a concurrent weighted communication tree algorithm for blockchain transaction (called WFT). This algorithm comprehensively considers the communication weight and the node communication link number. Several small weight nodes with powerful transmitting capacity are selected to locate in the top or upper part of the communication tree to improve the concurrency and efficiency. The proposed algorithm can provide the routing paths for blockchain transaction, and can improve the communication efficiency on blockchain. © 2020 IEEE.
Number of references: 16
Main heading: Efficiency
Controlled terms: Forestry - Blockchain - Trees (mathematics) - Information management - Digital storage
Uncontrolled terms: Communication efficiency - Communication schemes - Data transaction - Data-communication - Distributed data managements - Distributed infrastructure - Processing capacities - Transmitting capacities
Classification code: 722.1 Data Storage, Equipment and Techniques - 723.3 Database Systems - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 913.1 Production Engineering - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
DOI: 10.1109/INFOCOMWKSHPS50562.2020.9162673
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

390. Interaction mechanism between twin boundary and crystalline/amorphous interface in dual-phase Mg alloys

Accession number: 20200708156080
Authors: Zhang, K. (1); Song, H.Y. (1); Deng, Q. (2); 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
Corresponding author: Song, H.Y.(gsfshy@sohu.com)
Source title: Journal of Non-Crystalline Solids
Abbreviated source title: J Non Cryst Solids
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Issue date: 15 April 2020
Publication year: 2020
Article number: 119954
Language: English
ISSN: 00223093
CODEN: JNCSBJ
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: The effect of the introduction of {101¯2} twin boundary (TB) on the mechanical behavior of dual-phase amorphous/crystalline (A/C) MgAl/Mg alloys is investigated by molecular dynamics simulation. The results show that the introduction of TB can activate dislocation slip and HCP#FCC phase transformation, which can significantly facilitate the synergy interaction between the crystalline and amorphous phases and enhance the plastic deformability of the dual-phase Mg alloys. However, TB increases the plasticity of dual-phase Mg alloys at the expense of strength. To design high performance Mg alloys, we also study the effect of the spacing between TB and ACI (STA) on the mechanical properties of the dual-phase Mg alloys. It is worth highlighting that the yield strength of the dual-phase Mg alloys increases with the increase of STA. The simulations indicate that the high-strength and high-plasticity dual-phase Mg alloys can be obtained by introducing TBs and optimizing STAs. © 2020 Elsevier B.V.
Number of references: 52
Main heading: Plasticity
Controlled terms: Magnesium alloys - High strength alloys - Molecular dynamics - Deformation

Uncontrolled terms: Atomic simulations - Deformation mechanism - Dislocation slip - Interaction mechanisms - Mechanical behavior - Mg alloy - Molecular dynamics simulations - Twin boundaries
Classification code: 531.1 Metallurgy - 542.2 Magnesium and Alloys - 549.2 Alkaline Earth Metals - 801.4 Physical Chemistry - 951 Materials Science
DOI: 10.1016/j.jnoncrysol.2020.119954
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

391. High-sensitive Mach-Zehnder interferometer for humidity measurements based on concatenating single-mode concave cone and core-offset

Accession number: 20201208317221
Authors: Wang, Jie (1); Bian, Ce (1); Gang, Tingting (2); Hu, Manli (1)
Author affiliation: (1) School of Physics, Northwest University, Taibai Beilu 229, Xi'an; Shaanxi; 710069, China; (2) School of Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Hu, Manli(huml@nwu.edu.cn)
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Abbreviated source title: Optik
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Issue date: April 2020
Publication year: 2020
Article number: 164465
Language: English
ISSN: 00304026
Document type: Journal article (JA)
Publisher: Elsevier GmbH
Abstract: A simultaneous relative humidity (RH) and temperature sensor based on a single mode fiber (SMF) Mach-Zehnder interferometer (MZI) with polyimide (PI) coating is proposed and experimentally demonstrated. The sensor with controlled length is fabricated by splicing a concave cone and core-offset on a segment of SMF. Experimental results show that the RH response sensitivity of the sensor is -0.12458 dB/%RH, -0.20216 dB/%RH and -0.15201 dB/%RH when the length of the sensing fiber is 2.5 cm, 3 cm and 3.5 cm, respectively. The temperature sensitivity is 0.0577 nm/ oC at the length of the sensing fiber is 3 cm. Consequently, the advantages of simple fabrication, low cost, high RH sensitivity and simultaneous RH and temperature measurement ability mean the sensor has great potential applications in the field of RH measurement. © 2020
Number of references: 20
Main heading: Polyimides
Controlled terms: Single mode fibers - Temperature sensors - Temperature measurement - Mach-Zehnder interferometers
Uncontrolled terms: Fiber Sensor - Humidity measurements - Machzehnder interferometers (MZI) - Polyimide coating - Response sensitivity - Sensing fibers - Simultaneous measurement - Temperature sensitivity
Classification code: 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 815.1.1 Organic Polymers - 941.3 Optical Instruments - 944.5 Temperature Measuring Instruments - 944.6 Temperature Measurements
Numerical data indexing: Size 2.50e-02m, Size 3.00e-02m, Size 3.50e-02m
DOI: 10.1016/j.ijleo.2020.164465
Funding Details: Number: 61377087, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by the National Natural Science Foundation of China (No. 61377087).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

392. Enhanced plasticity by introducing amorphous phase in nanopolycrystal Cu: A molecular dynamics study

Accession number: 20202508839460
Authors: Song, H.Y. (1); Duan, B.B. (1); Wang, Y.J. (1, 2); An, M.R. (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)
Source title: Materials Chemistry and Physics
Abbreviated source title: Mater Chem Phys
Volume: 253
Issue date: 1 October 2020
Publication year: 2020
Article number: 123254
Language: English
ISSN: 02540584
CODEN: MCHPDR
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: The effect of amorphous phase CuZr on the plastic deformation behavior of nanopolycrystal Cu is investigated using molecular dynamics simulation. The results show that the introduction of amorphous phase can effectively enhance the plasticity of nanopolycrystal Cu owing to the cooperation interactions between amorphous and crystalline phases. The results also indicate that reducing grain size and increasing amorphous boundary (AB) spacing are equivalent to improving the plasticity of crystalline/amorphous Cu/CuZr nanocomposites, and the deformation mechanisms of dual-phase nanostructure Cu/CuZr composites obviously depend on grain size and AB spacing. © 2020 Elsevier B.V.
Number of references: 43
Main heading: Molecular dynamics
Controlled terms: Binary alloys - Copper alloys - Grain size and shape - Nanostructures - Plasticity - Copper - Zircaloy
Uncontrolled terms: Amorphous and crystalline phasis - Amorphous phase - Deformation mechanism - Dual phase - Grain size - Molecular dynamics simulations - Plastic deformation behavior
Classification code: 531 Metallurgy and Metallography - 544.1 Copper - 544.2 Copper Alloys - 761 Nanotechnology - 801.4 Physical Chemistry - 933 Solid State Physics - 951 Materials Science
DOI: 10.1016/j.matchemphys.2020.123254
Funding Details: Number: -, Acronym: SUST, Sponsor: Shaanxi University of Science and Technology; Number: 11572259, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: YCS17211031, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This work is supported by the National Natural Science Foundation of China (Grant No. 11572259), the Science Foundation of Shaanxi Province (No. 2018JM1013), the Youth Innovation Team of Shaanxi Universities and the Graduate Innovation and Practice Project of Xi'an Shiyou University (No. YCS17211031).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

393. Nanoscale pore structure heterogeneity and its quantitative characterization in Chang7 lacustrine shale of the southeastern Ordos Basin, China

Accession number: 20195007831235
Authors: Shan, Changan (1, 2, 3); Zhao, Weiwei (1, 3); Wang, Fengqin (1, 3); Zhang, Kun (4); Feng, Zhao (1); Guo, Liulinbo (1); Ma, Xueli (1); Liao, Tian (1)
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) Shaanxi Key Laboratory of Petroleum Accumulation Geology, Xi'an Shiyou University, Xi'an; 710065, China; (4) School of Geoscience and Technology, Southwest Petroleum University, Chengdu; 610500, China
Corresponding author: Shan, Changan(shanca@xsyu.edu.cn)
Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 187
Issue date: April 2020
Publication year: 2020

Article number: 106754
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: To gain a better understanding of nanoscale pore structure characteristics in Chang7 lacustrine shale, Ordos Basin, China, 33 shale samples from 15 wells are examined and analyzed by total organic carbon (TOC), X-ray diffraction (XRD), mercury porosimetry, helium pycnometry, low-pressure N2 adsorption experiments and fractal method. The results show that Chang7 lacustrine shale pores diameter is mainly from 1.5 to 5 nm, and mesopores give the largest contribution to the total pore specific surface area (SBET) and volume (VBJH), and micropores have the second contribution to SBET but little contribution to VBJH, macropores have very little contribution to SBET but make a good contribution to VBJH. According to the occurrence and origin of shale pores, micro-pores can be divided into mineral intragranular pore, minera intercrystalline pore and organic pore. Two fractal dimensions (D1 and D2) are obtained from N2 adsorption isotherms analysis using FHH method. Relationships between fractal dimensions and shale compositions, pore structure parameters are investigated, which show that both D1 and D2 have good positive relationships with SBET and VBJH, but obvious negative correlations with the average pore diameter. That is, the smaller the pore diameter, the more complex the pore structure is, resulting in the larger pore surface and volume. D1 and D2 are both positively correlated with total clay, illite, mixed-layer of illite-smectite, whereas no obvious relationships with chlorite, indicating that the layer and flocculent structure increase the complexity of nanoscale pore structure. TOC content has positive correlation with D1 but no obvious relationship with D2, indicating that the pores in organic matter are mostly micropores. Fractal dimensions are negatively correlated with total brittle mineral, quartz and feldspar content, that is because the surface of brittle minerals is smoother and more homogenous than that of clay minerals. © 2019 Elsevier B.V.
Number of references: 62
Main heading: Pore structure
Controlled terms: Microporosity - Organic carbon - Fractal dimension - Shale - Clay minerals - Metamorphic rocks - Feldspar - Nanotechnology
Uncontrolled terms: Flocculent structures - Fractal characteristics - Intercrystalline pores - Negative correlation - Positive correlations - Quantitative characterization - Structure characteristic - Structure heterogeneity
Classification code: 482.2 Minerals - 761 Nanotechnology - 804.1 Organic Compounds - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Size 1.50e-09m to 5.00e-09m
DOI: 10.1016/j.petrol.2019.106754
Funding Details: Number: 41372148,41702127,41772150,41804125, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: PLC20190503, Acronym: CDUT, Sponsor: Chengdu University of Technology; Number: 2019JQ-100, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 18JK620, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: -, Acronym: -, Sponsor: State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation; Number: 2017ZX05039001-002, Acronym: -, Sponsor: National Major Science and Technology Projects of China; Number: -, Acronym: -, Sponsor: Science and Technology Major Project of Guangxi;
Funding text: This research was jointly supported by the Open Fund of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology) (Grant No. PLC20190503), Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2019JQ-100), Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No.18JK620), the National science and technology major project (2017ZX05039001-002), the National Natural Science Foundation of China (Grant No. 41702127, 41772150, 41372148 and 41804125).This research was jointly supported by the Open Fund of State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation (Chengdu University of Technology) (Grant No. PLC20190503), Natural Science Basic Research Plan in Shaanxi Province of China (Grant No. 2019JQ-100), Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 18JK620), the National science and technology major project (2017ZX05039001-002), the National Natural Science Foundation of China (Grant No. 41702127 , 41772150 , 41372148 and 41804125). Appendix A
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

394. Re-division and evolution of sedimentary subfacies of Longmaxi shale in southern Sichuan Basin

Accession number: 20202908942053

Title of translation:
Authors: Pu, Boling (1, 2); Dong, Dazhong (3, 4, 5); Wang, Fengqin (1, 2); Liu, Guizhen (1, 2); Wang, Yuman (3); Huang, Jinliang (3)
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) Research Institute of Petroleum Exploration & Development, PetroChina, Beijing; 100083, China; (4) National Energy Shale Gas Research & Development (Experimental) Center, Langfang; 065007, China; (5) Key Laboratory of Unconventional Oil & Gas Resources, PetroChina, Langfang; 065007, China
Source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)
Abbreviated source title: Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)
Volume: 44
Issue: 3
Issue date: June 20, 2020
Publication year: 2020
Pages: 15-25
Language: Chinese
ISSN: 16735005
Document type: Journal article (JA)
Publisher: University of Petroleum, China
Abstract: In order to identify the sedimentary characteristics of the organic-rich shale from the Longmaxi Formation of the Lower Silurian in the southern Sichuan Basin, a series of studies, including lithology, lithofacies, sedimentary structures, organic matter contents, mineral composition, biogenic fossils and logging responses, were carried out in this paper. The lithofacies and sedimentary subfacies were classified, and the sedimentary evolution model of Longmaxi shale in southern Sichuan Basin was established. The results show that: there are seven types of lithofacies developed in the Longmaxi shale, including graptolite-rich shale, carbonaceous shale, siliceous shale, calcareous shale, muddy limestone, silty shale and argillaceous shale. Three types of sedimentary subfacies were developed, including deep-water shelf, semi-deep-water shelf and shallow shelf. According to the physical condition of the graptolite, the sedimentary water depth was different in different geological ages. When the Longmaxi formation was deposited, through the Rudan stage to the Telychian stage, the sedimentary center gradually migrated from the Changning area to the north-west Weiyuan area. Three stages of sediments were deposited in the Weiyuan area, while there were only two stages of sediments deposited in the Changning area. It is concluded that there are great differences in the distribution of lithofacies and sedimentary subfacies of the Longmaxi shale in southern Sichuan Basin due to the influence of palaeosedimentary environment and paleotectonic evolution, showing strong heterogeneity. Deep-water shelf is the best favorable sedimentary subfacies for shale gas enrichment.
Number of references: 24
Main heading: Lithology
Controlled terms: Clay minerals - Sedimentology - Lime
Uncontrolled terms: Mineral composition - Organic matter content - Organic-rich shales - Physical conditions - Sedimentary characteristics - Sedimentary evolution - Sedimentary structure - Strong heterogeneities
Classification code: 481.1 Geology - 482.2 Minerals - 804.2 Inorganic Compounds
DOI: 10.3969/j.issn.1673-5005.2020.03.002
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

395. Experimental study on wettability of crude oil on the surface of plastic alloy pipe in an oilfield field (*Open Access*)

Accession number: 20202908936289
Authors: Wu, Yan (1); Ding, Haopeng (2); Liu, Wei (1); Wen, Ziyan (2); Deng, Zhian (2); Miao, Kun (2)
Author affiliation: (1) Research Institute of Engineering and Technology, Xinjiang Oilfield Company, Xinjiang; 834000, China; (2) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Ding, Haopeng(598959241@qq.com)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 514
Part number: 2 of 5

Issue: 2
Issue title: 4th International Symposium on Resource Exploration and Environmental Science - 1. Resource Exploration and Utilization, Geography and Geological Engineering
Issue date: July 2, 2020
Publication year: 2020
Article number: 022016
Language: English
ISSN: 17551307
E-ISSN: 17551315
Document type: Conference article (CA)
Conference name: 4th International Symposium on Resource Exploration and Environmental Science, REES 2020
Conference date: April 25, 2020 - April 26, 2020
Conference location: Ordos, China
Conference code: 161594
Publisher: IOP Publishing Ltd
Abstract: Non-metallic pipe is widely used in oilfield development in recent years because of its excellent corrosion resistance. In this paper, the wetting properties of the plastic alloy tube surface based on the contact angle of crude oil in some oil fields in Xinjiang Oilfield were experimentally studied. The wettability of the plastic alloy tube surface and its influence on the flow resistance were discussed. The wettability of metal surfaces was compared. This experimental study is helpful for the oilfield to make reasonable pipe selection. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 4
Main heading: Wetting
Controlled terms: Pipeline corrosion - Oil field development - Crude oil - Contact angle - Corrosion resistance
Uncontrolled terms: Excellent corrosion resistances - Flow resistance - Metal surfaces - Non-metallic - Plastic alloys - Surface-based - Wetting property - Xinjiang
Classification code: 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 539.1 Metals Corrosion - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1088/1755-1315/514/2/022016
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

396. The effect of the cooling rates on the microstructure and high-temperature mechanical properties of a nickel-based single crystal superalloy (*Open Access*)

Accession number: 20204209352106
Authors: Wang, Xiao-Yan (1, 2); Li, Meng (1); Wen, Zhi-Xun (1)
Author affiliation: (1) School of Mechanics, Civil Engineering and Architecture, Northwestern Polytechnical University, Xi'an; 710072, China; (2) School of Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Wang, Xiao-Yan(shiyouwxy@126.com)
Source title: Materials
Abbreviated source title: Mater.
Volume: 13
Issue: 19
Issue date: October 2020
Publication year: 2020
Article number: 4256
Language: English
E-ISSN: 19961944
Document type: Journal article (JA)
Publisher: MDPI AG
Abstract: The as-cast alloy of nickel-based single-crystal superalloy was used as the research object. After four hours of solution treatment at 1315 °C, four cooling rates (water cooling (WC), air cooling (AC) and furnace cooling (FC1/FC2)) were used to reduce the alloy to room temperature. Four different microstructures of nickel-based superalloy material were prepared. A high-temperature tensile test at 980 °C was carried out to study the influence of various rates on the formation of the material's microstructure and to further obtain the influence of different microstructures on the high-temperature mechanical properties of the materials. The results show that an increase of cooling rate

resulted in a larger #' phase nucleation rate, formation of a smaller #' phase and a greater number. When air cooling was used, the uniformity of the #' phase and the coherence relationship between the #' phase and the γ phase were the best. At the same time, the test alloy had the best high-temperature tensile properties, and the material showed a certain degree of plasticity. TEM test results showed that the test alloy mainly blocked dislocations from traveling in the material through the strengthening effect of #', and that AC had the strongest hindering effect on #' dislocation movement. © 2020 by the authors.
Number of references: 28
Main heading: Cooling
Controlled terms: Nickel alloys - Single crystals - Superalloys - Tensile testing
Uncontrolled terms: Degree of plasticity - Dislocation movement - High temperature mechanical properties - High temperature tensile properties - High temperature tensile tests - Nickel- based superalloys - Single crystal superalloys - Strengthening effect
Classification code: 531 Metallurgy and Metallography - 548.2 Nickel Alloys - 641.2 Heat Transfer - 933.1 Crystalline Solids
Numerical data indexing: Temperature 1.25e+03K, Temperature 1.59e+03K
DOI: 10.3390/MA13194256
Funding Details: Number: 51875462,tc2019dyds11, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This research was funded by the National Natural Science Foundation of China, grant number 51875462 and Taicang Scientific Research Institute Innovation leading special plan (Project No.: tc2019dyds11).Investigation, M.L. and X.-Y.W.; Data curation, M.L.; Writing—Original draft preparation, X.-Y.W. and M.L.; Writing—Review and editing, X.-Y.W.; Funding acquisition, Z.-X.W. All authors have read and agreed to the Wpurbitliinshge—dRveevrsieiown aonfdtheedmitianngu,sXcr.-iYpt.W. .; Funding acquisition, Z.-X.W. All authors have read and agreed to the published version of the manuscript. Funding: This research was funded by the National Natural Science Foundation of China, grant number 51875462 Funding: This research was funded by the National Natural Science Foundation of China, grant number 5C1o8n7f5l4ic6t2s aonfdIn Ttaeirceasnt:gT Shceieanutitfhico rRsedseeaclracrhe Innostcitountfel iIcntnoofvinatteiorenslte. ading special plan (Project No.: tc2019dyds11).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

397. Experimental study on the peeling characteristics of wax on the surface of plastic alloy pipe and glass steel pipe (*Open Access*)

Accession number: 20202908936288
Authors: Liu, Wei (1); Ding, Haopeng (2); Wu, Yan (1); Miao, Kun (2); Deng, Zhian (2); Wen, Ziyan (2)
Author affiliation: (1) Research Institute of Engineering and Technology, Xinjiang Oilfield Company, Xinjiang; 834000, China; (2) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Ding, Haopeng(598959241@qq.com)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 514
Part number: 2 of 5
Issue: 2
Issue title: 4th International Symposium on Resource Exploration and Environmental Science - 1. Resource Exploration and Utilization, Geography and Geological Engineering
Issue date: July 2, 2020
Publication year: 2020
Article number: 022015
Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 4th International Symposium on Resource Exploration and Environmental Science, REES 2020
Conference date: April 25, 2020 - April 26, 2020
Conference location: Ordos, China
Conference code: 161594
Publisher: IOP Publishing Ltd

Abstract: Plastic alloy pipes and glass steel pipes are two widely used non-metallic pipes. In this paper, sliced paraffin was used to perform waxing and peeling experiments on the lining surfaces of two types of pipes, investigating the effects of temperature and wax thickness on the surface peeling force of two types of pipe line. This experimental study has certain guiding effect on the selection of non-metallic pipes and the design of the wax removal device. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Steel pipe
Controlled terms: Glass - Plastic pipe
Uncontrolled terms: Effects of temperature - Guiding effect - Non-metallic - Plastic alloys - Surface peeling - Wax removal
Classification code: 545.3 Steel - 619.1 Pipe, Piping and Pipelines - 812.3 Glass - 817.1 Polymer Products
DOI: 10.1088/1755-1315/514/2/022015
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

398. Sensing terminal for big data oil and gas pipeline corrosion monitoring

Accession number: 20205109638685
Authors: Li, Lin (1, 2); Wang, Yiding (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 - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
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Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Facing the construction requirements of big data pipelines, a distributed sensor terminal for multi-parameter monitoring of oil and gas pipeline anti-corrosion was designed. The terminal uses the microprocessor S3C2440A as the core, and several sensors form a multi-parameter sensor array monitoring circuit, and realizes the data transmission of the Internet of Things through the 4G DTU communication module and TCP protocol. The device can sense the temperature value, reference potential value, programmable power supply current and voltage output value of the long-distance pipeline in real time, and realize the data interaction with the cloud server. Tests show that the device is practical in realizing the application of big data pipeline monitoring value. © 2020 IEEE.
Number of references: 8
Main heading: Internet of things
Controlled terms: Pipelines - Big data - Pipeline corrosion
Uncontrolled terms: Communication modules - Construction requirements - Distributed sensor - Long distance pipelines - Monitoring circuit - Multi-parameter sensor - Oil-and-Gas pipelines - Programmable power supply
Classification code: 539.1 Metals Corrosion - 619.1 Pipe, Piping and Pipelines - 722.3 Data Communication, Equipment and Techniques - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing
DOI: 10.1109/ICCNEA50255.2020.00064
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;

Funding text: The research was funded by the Xi'an Shiyou University Innovation and Practice Ability Training Project.The research was funded by the Xi'an Shiyou University
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

399. The application of big data analysis in the research of innovation and entrepreneurship education for humanities college students (*Open Access*)

Accession number: 20204809531830
Authors: Zhang, Haitao (1); Yang, Chen (2)
Author affiliation: (1) College of Humanities, Xi'an Shiyou University, 710065, China; (2) College of International Education, Xi'an Shiyou University, 710065, China
Corresponding author: Zhang, Haitao(14326588@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1648
Part number: 2 of 4
Issue: 2
Issue title: 2020 International Conference on Building Technology and Computer Science, BTCS 2020 - Computer Technology
Issue date: October 30, 2020
Publication year: 2020
Article number: 22073
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Building Technology and Computer Science, BTCS 2020
Conference date: August 10, 2020 - August 12, 2020
Conference location: Taiyuan, Shanxi, China
Conference code: 164562
Publisher: IOP Publishing Ltd
Abstract: The advent of the Internet+ era puts forward new requirements for innovation and entrepreneurship education for undergraduates in the humanities. Based on the analysis of big data, this article first elaborates the current research status of innovation and entrepreneurship education in the humanities, and the characteristics that innovation and entrepreneurship talents should possess. Finally, aiming at the unique difficulties and problems faced by the undergraduates of humanities in colleges and universities, this paper gives suggestions and strategies to promote their healthy development. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 6
Main heading: Big data
Controlled terms: Data handling - Students - Information analysis
Uncontrolled terms: College students - Colleges and universities - Current research status - Entrepreneurship education
Classification code: 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis
DOI: 10.1088/1742-6596/1648/2/022073
Funding Details: Number: SGH17H077, Acronym: -, Sponsor: -;
Funding text: Planning project of educational science in Shaanxi province: The research about innovative literacy of liberal arts 'college students under the background of "Internet +"(SGH17H077).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

400. Thermal behavior calculation and analysis of submerged combustion LNG vaporizer

Accession number: 20202708903796
Authors: Pan, Jie (1); Mao, Di (1); Bai, Junhua (1); Tang, Linghong (2); Li, Ran (1)

Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) College of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Li, Ran(rli@xsyu.edu.cn)
Source title: Applied Thermal Engineering
Abbreviated source title: Appl Therm Eng
Volume: 178
Issue date: September 2020
Publication year: 2020
Article number: 115660
Language: English
ISSN: 13594311
CODEN: ATENFT
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Submerged combustion vaporizer (SCV) is widely equipped in liquefied natural gas (LNG) gasification plants and receiving terminals as the emergency or peaking regasification facility. This paper constructs an energy balance-based numerical model to predict the thermal behavior of SCV operating at subcritical pressures. The heat transfer coupling between the ice formation at the water bath-side and the flow boiling at the LNG-side is considered in the numerical model for the first time, and numerous correlations are utilized to estimate the convective heat transfer rate at both the water bath and LNG sides. The thermal behavior of a typical SCV in the presence of ice layer is studied numerically after validating against the field operating data. The predicted results indicate that the SCV can vaporize cryogenic LNG to a near-normal atmospheric temperature under low water bath temperatures, although an ice layer, having negative effects on heat transfer, is formed on the lower part of the heat transfer tube. Both the operating parameters and heat transfer enhancement measures have significant impacts on the thermal behavior. © 2020 Elsevier Ltd
Number of references: 27
Main heading: Liquefied natural gas
Controlled terms: Heat transfer coefficients - Ice - Heat convection - Gas plants - Combustion - Numerical models
Uncontrolled terms: Convective heat transfer rates - Gasification plants - Heat Transfer enhancement - Liquefied Natural Gas (LNG) - Operating parameters - Subcritical pressure - Submerged combustion vaporizers - Thermal behaviors
Classification code: 522 Gas Fuels - 523 Liquid Fuels - 641.2 Heat Transfer - 921 Mathematics
DOI: 10.1016/j.applthermaleng.2020.115660
Funding Details: Number: 51304160,51774237, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-285, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: YCS20111002, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This study was supported by the National Natural Science Foundation of China (Grant No. 51774237 , 51304160), the Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-285) and the Graduate Innovation & Practice Ability Development Program Funded by Xi'an Shiyou University (YCS20111002).This study was supported by the National Natural Science Foundation of China (Grant No. 51774237, 51304160), the Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-285) and the Graduate Innovation & Practice Ability Development Program Funded by Xi'an Shiyou University (YCS20111002).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

401. Synthesis of poly (stearyl methyl acrylate) and its pour point depression performance

Accession number: 20203809213669
Title of translation:
Authors: Ding, Li-Qin (1); Li, Meng-Ge (1); Nian, Li-Li (1); Liang, Sheng-Rong (2); Su, Bi-Yun (1)
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
Corresponding author: Ding, Li-Qin(lqding@xsyu.edu.cn)
Source title: Gao Xiao Hua Xue Gong Cheng Xue Bao/Journal of Chemical Engineering of Chinese Universities
Abbreviated source title: Gao Xiao Hua Xue Gong Cheng Xue Bao
Volume: 34
Issue: 4

Issue date: August 1, 2020
Publication year: 2020
Pages: 990-995
Language: Chinese
ISSN: 10039015
CODEN: GHGXEG
Document type: Journal article (JA)
Publisher: Zhejiang University
Abstract: Traditional free radical polymerization has poor controllability. Poly (stearyl methyl acrylate) (PSMA) was prepared using H2L-Ni-salicylaldehyde as a catalyst and azodiisobutyronitrile (AIBN) as a co-catalyst to improve its pour point depression performance. The structure of PSMA was characterized by infrared spectroscopy (FT-IR), nuclear magnetic resonance (1H NMR) and gel permeation chromatography (GPC) followed by evaluating the pour point depression performance. The results show that the catalytic activity and average molecular weights are higher and controllability is better under reaction conditions of molar ratio of co-catalyst to catalyst = 4:1 and monomer to catalyst = 3 200:1 at 90 for 10 h. The synthesized polymer (PSMA) had a positive effect on the pour point depressing of Changqing crude oil and its diesel fraction, which was the best (#SP =12) when the concentration of PSMA was 0.75%.
Number of references: 22
Main heading: Nuclear magnetic resonance
Controlled terms: Catalyst activity - Gel permeation chromatography - Free radical polymerization - Acrylic monomers - Infrared spectroscopy - Molar ratio - Free radicals - Nuclear magnetic resonance spectroscopy
Uncontrolled terms: Average molecular weight - Co catalysts - Diesel fractions - Gel permeation chromatography (GPC) - Methyl acrylates - Reaction conditions - Salicylaldehyde - Synthesized polymers
Classification code: 801.4 Physical Chemistry - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 815.2 Polymerization
Numerical data indexing: Percentage 7.50e-01%, Time 3.60e+04s
DOI: 10.3969/j.issn.1003-9015.2020.04.019
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

402. Preparation of Pour Point Depressant Poly (Lauryl Methacrylate) With Salen-Ni Complex Catalyst

Accession number: 20201508389112
Title of translation: Salen-Ni
Authors: Ding, Liqin (1); Nian, Lili (1); Li, Mengge (1); Chen, Xiaoluo (1); Liang, Shengrong (2); Su, Biyun (1)
Author affiliation: (1) College of Chemistry & Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Modern Analysis and Testing Center, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Ding, Liqin(lqding@xsyu.edu.cn)
Source title: Shiyou Xuebao, Shiyou Jiagong/Acta Petrolei Sinica (Petroleum Processing Section)
Abbreviated source title: Shiyou Xuebao Shiyou Jiagong
Volume: 36
Issue: 2
Issue date: March 25, 2020
Publication year: 2020
Pages: 308-314
Language: Chinese
ISSN: 10018719
CODEN: SXSHEY
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Poly(lauryl methacrylate)(PLMA) was synthesized with a symmetric Salen-Ni-Salicylalde hyde complex/ azodiisobutyronitrile (AIBN) catalyst system by solution polymerization in toluene through Schlenk device. The structure of PLMA was further characterized by FT-IR and 1H NMR techniques. Meanwhile, the relative molecular mass and its distribution of PLMA polymer were determined by gel permeation chromatography (GPC). Performance of the synthesized pour point dispressant was also evaluated. Experimental results show that the optimum synthetic reactions conditions are: molar ratio of co-catalyst(AIBN) and catalyst (Salen-Ni-Salicylaldehyde) 3:1, reaction temperature of 110 , reaction time 8 h, ratio of monomer and catalyst 2400:1.Under the above conditions, the

catalyst activity can be 4.087 ×104 g/(mol•h). Relative molecular mass of the polymer is in the range of 2.563×104 to 10.527×104. When 1.5% PLMA was added to diesel fraction (300-340) and lubricant fraction (380-400), pour point of the diesel and lubricant could decrease 5-10 and 2-6 , respectively. When 2.0% PLMA was added to the diesel fraction (300-340), pour point of the diesel could decrease 12 and the additive demonstrated very good performance.
Number of references: 14
Main heading: Polymerization
Controlled terms: Gel permeation chromatography - Diesel engines - Molar ratio - Nickel compounds - Catalyst activity - Molecular mass
Uncontrolled terms: Diesel fractions - Gel permeation chromatography (GPC) - Lauryl methacrylate - Pour point depressants - Reaction temperature - Relative molecular mass - Solution polymerization - Synthetic reactions
Classification code: 612.2 Diesel Engines - 801 Chemistry - 801.4 Physical Chemistry - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 815.2 Polymerization
Numerical data indexing: Percentage 1.50e+00%, Percentage 2.00e+00%, Time 2.88e+04s
DOI: 10.3969/j.issn.1001-8719.2020.02.011
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

403. Numerical investigation on thermal-hydraulic performance of a printed circuit LNG vaporizer

Accession number: 20194907777124
Authors: Pan, Jie (1); Wang, Jinghan (1); Tang, Linghong (2); Bai, Junhua (1); Li, Ran (1); Lu, Yinbin (2); Wu, Gang (1)
Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an; Shaanxi Province; 710065, China; (2) College of Mechanical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi Province; 710065, China
Corresponding author: Pan, Jie(jackpan@xsyu.edu.cn)
Source title: Applied Thermal Engineering
Abbreviated source title: Appl Therm Eng
Volume: 165
Issue date: 25 January 2020
Publication year: 2020
Article number: 114447
Language: English
ISSN: 13594311
CODEN: ATENFT
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: As a new type of micro-channel heat exchanger, printed circuit heat exchanger (PCHE) is widely applied to floating storage and regasification unit (FSRU) as LNG vaporizer for high efficiency and compactness. In this paper, a three-dimensional numerical model of counter-flow printed circuit LNG vaporizer is established, applying supercritical LNG and propane as cold source and heat source respectively. The flow and heat transfer characteristics in semicircular channels, and the effects of channel bending angle on them are studied. The results indicate that the channel bending causes the accelerating core of cold and hot fluids close to the inner wall of the corner, thinning or even destructing the boundary layer, which is conducive to convective heat transfer, although causes greater flow resistance. The larger the channel bending angle, the better the heat transfer and the greater the pressure drop. The criterion #=Nu/Nu0/f/f0 is used to evaluate the thermal-hydraulic performance of the printed circuit LNG vaporizer, and it shows that the channel bending angle 15° offers the best comprehensive performance. © 2019 Elsevier Ltd
Number of references: 19
Main heading: Numerical models
Controlled terms: Printed circuit boards - Heat convection - Boundary layers - Timing circuits - Heat resistance - Heat exchangers - Propane
Uncontrolled terms: Comprehensive performance - Floating storage and regasification units - Flow and heat transfer - Micro-channel heat exchangers - Printed circuit heat exchangers - Supercritical - Thermal-hydraulic performance - Three-dimensional numerical modeling
Classification code: 616.1 Heat Exchange Equipment and Components - 641.2 Heat Transfer - 713.4 Pulse Circuits - 921 Mathematics
DOI: 10.1016/j.applthermaleng.2019.114447

Funding Details: Number: 51304160,51774237, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 15JK1581, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: YCS18213065, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This study was supported by the National Natural Science Foundation of China (Grant Nos. 51774237 , 51304160), the Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 15JK1581) and Graduate Innovation & Practice Ability Development Program Funded by Xi'an Shiyou University (YCS18213065).This study was supported by the National Natural Science Foundation of China (Grant Nos. 51774237, 51304160), the Scientific Research Program Funded by Shaanxi Provincial Education Department (Program No. 15JK1581) and Graduate Innovation & Practice Ability Development Program Funded by Xi'an Shiyou University (YCS18213065).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

404. Design and development of virtual experiment network platform for rig control

Accession number: 20205109638809
Authors: Sha, Linxiu (1, 2); Cheng, Changfeng (1, 2)
Author affiliation: (1) Shaanxi Key Laboratory of Drilling Rig Control, Xi'An Shiyou University, Xi'an, China; (2) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Issue date: September 2020
Publication year: 2020
Pages: 399-403
Article number: 9239758
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: With the continuous development of oil and gas exploration technology, virtual reality technology has been introduced into rig control teaching and research field. Using the network technology, the interactive platform provides a new way which can reduce training cost, the risk of authentic drilling research as well as the limitation of space and time. It is introduced how to design virtual experiment network platform based on Web technology which is included control practical operations, control optimization and online examination projects for rig control. It integrates intelligent optimization, remote interaction, dynamic display of virtual reality and training management. This platform contributes can not only resolve the difficulties of recognition, operation and experimentation for petroleum engineering students in drilling field, but also meet the professional quality training of employees in the rig control field. © 2020 IEEE.
Number of references: 10
Main heading: Virtual reality
Controlled terms: Infill drilling - Petroleum prospecting - Personnel training - Quality control
Uncontrolled terms: Continuous development - Design and Development - Intelligent optimization - Network technologies - Oil and gas exploration - On-line examinations - Teaching and researches - Virtual reality technology
Classification code: 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 723 Computer Software, Data Handling and Applications - 912.4 Personnel - 913.3 Quality Assurance and Control
DOI: 10.1109/ICCNEA50255.2020.00088
Funding Details: Number: 18JS095,290088112,331890049, Acronym: -, Sponsor: -; Number: 2020GY-046, Acronym: -, Sponsor: Agriculture Department of Shaanxi Province;

Funding text: ACKNOWLEDGMENT The project is funded by the key R&D project of Shaanxi Province in Shaanxi Province, the development of a virtual simulation platform for remote interactive optimization control of oil and gas rigs (2020GY-046), the research project of the Key Laboratory of Shaanxi Provincial Department of Education: Multi-objective interactive optimization study of complex borehole trajectory while drilling (18JS095), school-level 2019 virtual simulation experiment teaching project: virtual simulation experiment of remote interactive optimization control of virtual oil and gas rigs (331890049), school-level youth innovation project: dynamic control of drilling process based on stochastic reservoir modeling (290088112) and the Graduate Innovation and Practical Ability Training Program of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

405. A new electrical imaging logging method in oil-based mud for low-resistivity formation based on concave electrode couples

Accession number: 20194807737936
Authors: Gao, Jianshen (1); Liu, Xin (1); Zhao, Jianpeng (2); Xie, Xicao (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China
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Source title: Journal of Petroleum Science and Engineering
Abbreviated source title: J. Pet. Sci. Eng.
Volume: 185
Issue date: February 2020
Publication year: 2020
Article number: 106675
Language: English
ISSN: 09204105
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Electrical imaging logging can provide high-resolution information and occupies a pivotal position in reservoir exploration and evaluation. To realize clear electrical imaging in high-resistivity oil-based mud (OBM), researchers have tried various methods. In the existing methods, there are some worrisome issues such as the challenge in clear imaging in low-resistivity formation, the complication and robustness in the inversion of quantitative interpretation and few obtained parameters etc. In this paper, a gratifying way with the help of concave electrode couple is presented and analyzed particularly to focus on the quantitative evaluation in low-resistivity formation. The imaging pad structure and its work principle are first introduced. Then, a systematical and mathematical statement is carried out to obtain desired formation resistivity and standoff between imaging pad and borehole wall. Furthermore, sensitivity analysis is implemented to make clear the performances of measured values including equivalent formation resistance, tool factor and calculated standoff under the influence of multiple parameters. Finally, several imaging tests are shown to demonstrate the effectiveness of this new method presented in this paper. The results shown that profiting from the change of traditional electrode array to concave electrode couples, the formation resistivity and standoff between the pad and borehole wall in low-resistivity formation can be measured simultaneously. Another major advantage of this new method is that the unknown OBM parameters are unnecessarily mastered, and the entire process is free from complicated iterative computation. This study provides another new choice for the electrical imaging logging in OBM. © 2019 Elsevier B.V.
Number of references: 26
Main heading: Electrodes
Controlled terms: Boreholes - Oil well logging - Petroleum prospecting - Sensitivity analysis - Iterative methods
Uncontrolled terms: Concave electrode couple - Electrical imaging - Formation resistivity - Low resistivity - Oil-based mud - Standoff
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 921 Mathematics - 921.6 Numerical Methods
DOI: 10.1016/j.petrol.2019.106675
Funding Details: Number: 41804115,41804125, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2018JQ4008, Acronym: -, Sponsor: Natural Science Foundation of Shanxi Province; Number: 19JK0665, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: The authors would like to thank the anonymous reviewers for their valuable suggestions and comments, and the support by the Chinese National Science Foundation (no. 41804115 , 41804125), Natural Science Foundation

of Shanxi Province , China (no. 2018JQ4008), and Scientific Research Program Funded by Shaanxi Provincial Education Department (no. 19JK0665). Appendix AThe authors would like to thank the anonymous reviewers for their valuable suggestions and comments, and the support by the Chinese National Science Foundation (no. 41804115, 41804125), Natural Science Foundation of Shanxi Province, China (no. 2018JQ4008), and Scientific Research Program Funded by Shaanxi Provincial Education Department (no. 19JK0665).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

406. Research on the algorithm of seat arrangement in olympic stadium

Accession number: 20213910944791
Authors: Sun, Shu-E (1)
Author affiliation: (1) Xi'An Shiyou University, Shaanxi, Xi'an; 710065, China
Corresponding author: Sun, Shu-e(sse63@126.com)
Source title: Proceedings - 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
Abbreviated source title: Proc. - Int. Conf. Robot. Intell. Syst., ICRIS
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
Issue date: November 2020
Publication year: 2020
Pages: 619-622
Language: English
ISBN-13: 9780738124070
Document type: Conference article (CA)
Conference name: 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
Conference date: November 7, 2020 - November 8, 2020
Conference location: Sanya, China
Conference code: 171603
Sponsor: Hainan Tropical Ocean University; Huaian Numerical Control Association; Jiangsu Key Laboratory of Advanced Manufacturing Technology; Shenzhen Research Institute of Central South University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The construction of large city stadiums or Olympic sports centers is very necessary, especially in China, where the population ranks first in the world and the total economic volume ranks second in the world. In addition to the rationality, practicability and aesthetic value of seat distribution, the designer should consider the safety of evacuation. Therefore, considering the above factors, the mathematical model of seat arrangement of Olympic venues is established, that is, an arithmetic sequence of periodical arithmetic jump, It is the theoretical basis for engineering designers to use computer to deal with big data and arrange seats scientifically. © 2020 IEEE.
Number of references: 7
Main heading: Stadiums
Controlled terms: Recreation centers
Uncontrolled terms: Aesthetic value - Engineering designer - Large cities - Olympic stadium - Olympics - Sports center
Classification code: 402.2 Public Buildings - 403 Urban and Regional Planning and Development
DOI: 10.1109/ICRIS52159.2020.00156
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

407. Review of the Development of Rotary Steerable Systems (*Open Access*)

Accession number: 20203809182378
Authors: Li, Fei (1); Ma, Xueying (1); Tan, Yuqi (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University
Corresponding author: Li, Fei(lif@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1617
Part number: 1 of 1

Issue: 1
Issue title: 2nd International Conference on Electronic Engineering and Informatics
Issue date: August 25, 2020
Publication year: 2020
Article number: 012085
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 2nd International Conference on Electronic Engineering and Informatics, EEI 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Lanzhou, China
Conference code: 162560
Publisher: Institute of Physics Publishing
Abstract: The rotary steerable system is essential for the development of unconventional oil and gas in China, and remains the core of the current oil drilling technology development. This paper outlines the research and development history, classification, development status of the rotary steerable system, and summarizes the advantages and disadvantages of different systems. Moreover, the prospects of the intelligent RSS technology is explored, and the outlook for the future development of the steerable drilling technology is presented. © Published under licence by IOP Publishing Ltd.
Number of references: 16
Main heading: Rotating machinery
Controlled terms: Infill drilling
Uncontrolled terms: Development status - Oil drilling - Research and development - Rotary steerable systems - Steerable drillings - Unconventional oil and gas
Classification code: 511.1 Oil Field Production Operations - 601.1 Mechanical Devices
DOI: 10.1088/1742-6596/1617/1/012085
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

408. Showing the brilliance of human nature of mathematics under the concept of cultural education

Accession number: 20202608864881
Authors: Sun, Shu-E (1)
Author affiliation: (1) Xi'An Shiyou University, Xi'an, Shaanxi; 710065, China
Corresponding author: Sun, Shu-E(sse63@126.com)
Source title: Proceedings - 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Abbreviated source title: Proc. - Int. Conf. Intell. Transp., Big Data Smart City, ICITBS
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Issue date: January 2020
Publication year: 2020
Pages: 626-630
Article number: 9110054
Language: English
ISBN-13: 9781728166971
Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Conference date: January 11, 2020 - January 12, 2020
Conference location: Vientiane, Laos
Conference code: 160946
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: Under the concept of cultural education, through the life experience of mathematical knowledge, deeply excavate the mathematical culture hidden deep in mathematical knowledge, so that mathematical knowledge shines

out of the brilliance of human nature, thus sublimating people's ideological character, the psychological complex of the people, the philosophy of human life, The spiritual freedom of viewing people makes mathematics education a kind of life education of enlightenment, education, aesthetic beauty and perfection under the concept of cultural education. © 2020 IEEE.
Number of references: 10
Uncontrolled terms: Cultural education - Human lives - Human nature - Life experiences - Mathematical knowledge - Mathematics education
Classification code: 723.2 Data Processing and Image Processing
DOI: 10.1109/ICITBS49701.2020.00138
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

409. The Strategy of Ideological and Political Education in Liberal Mathematics General Course of University and Its Leading Role in Scientific and Cultural Value

Accession number: 20204209346183
Authors: Sun, Shu-E (1)
Author affiliation: (1) Xi'an Shiyou University, Xi'an, Shaanxi; 710065, China
Corresponding author: Sun, Shu-e(sse63@126.com)
Source title: Proceedings - 2020 International Conference on Big Data and Informatization Education, ICBDIE 2020
Abbreviated source title: Proc. - Int. Conf. Big Data Informatiz. Educ., ICBDIE
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Big Data and Informatization Education, ICBDIE 2020
Issue date: April 2020
Publication year: 2020
Pages: 159-164
Article number: 9150215
Language: English
ISBN-13: 9781728159003
Document type: Conference article (CA)
Conference name: 2020 International Conference on Big Data and Informatization Education, ICBDIE 2020
Conference date: April 24, 2020 - April 26, 2020
Conference location: Zhangjiajie, China
Conference code: 162087
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: This paper uses the theory and methodology of culture to explore the essence and realization logic of ideological and political education. This paper discusses the importance of ideological and political development of subject curriculum in liberal arts mathematics education and its educational thought strategy, and analyzes the functions of cultural education and scientific education in liberal arts mathematics general course. And Under the view of knowledge and teaching in the postmodern horizon, the paper analyzes the leading role of scientific and cultural value in the subject of liberal arts mathematics about the two aspects of teaching content and teaching means. © 2020 IEEE.
Number of references: 21
Main heading: Curricula
Controlled terms: Teaching - Functions
Uncontrolled terms: Cultural education - Cultural value - Ideological and political educations - Liberal arts - Mathematics education - Scientific education - Teaching contents - Teaching means
Classification code: 901.2 Education - 921 Mathematics
DOI: 10.1109/ICBDIE50010.2020.00043
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

410. Application of Data Mining in Academic Early Warning

Accession number: 20211210102080
Authors: Han, Jiaxin (1); Wang, Gangtao (1)
Author affiliation: (1) Xi'an Shiyou University, Computer Science, Xi'an, China

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Abbreviated source title: Proc. - Int. Conf. Mach. Learn., Big Data Bus. Intell., MLBDBI
Part number: 1 of 1
Issue title: Proceedings - 2020 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Issue date: October 2020
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Article number: 9361050
Language: English
ISBN-13: 9781728196381
Document type: Conference article (CA)
Conference name: 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Conference date: October 23, 2020 - October 25, 2020
Conference location: Chengdu, China
Conference code: 167501
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Nowadays, the phenomenon of college students failing in examinations is becoming more and more prominent. With the accumulation of failing credits, students lose the qualification to receive the degree certificate or repeat the grade, how to ensure that students complete their studies normally has become a hot topic in college education. This paper uses the test scores and student status information of the 2014 students as the data basis, analyzes the data, uses the Pearson correlation coefficient to study the correlation between the target attribute and other attributes, and uses the support vector machine, logistic regression, random forest, decision tree, and KNN five common classification algorithms to build Academic early warning models, uses Precision, ROC curve and cross-validation as model evaluation indicators. Experiments show that the recognition rate of the academic early warning model for students' academic performance is as high as 93.07%. © 2020 IEEE.
Number of references: 10
Main heading: Students
Controlled terms: Classification (of information) - Data mining - Education computing - Support vector machines - Decision trees - Logistic regression
Uncontrolled terms: Academic performance - Classification algorithm - College education - Cross validation - Early-warning models - Model evaluation - Pearson correlation coefficients - Status informations
Classification code: 716.1 Information Theory and Signal Processing - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.2 Mathematical Statistics - 961 Systems Science
Numerical data indexing: Percentage 9.31e+01%
DOI: 10.1109/MLBDBI51377.2020.00012
Funding Details: Number: YCS20111006, Acronym: -, Sponsor: -;
Funding text: ACKNOWLEDGMENT This work was financially supported by the Xi’an shiyou University Graduate Innovation and Practice Ability Development Project (YCS20111006).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

411. Study on the Structural Parameters and Response Characteristics of the Tilted Antenna of Directional Electromagnetic Wave Resistivity Measuring Instrument

Accession number: 20192607111986
Authors: Xie, Xicao (1); Wu, Jie (1)
Author affiliation: (1) Xi'an Shiyou University, Xi'an, Shaanxi; 710065, China
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Source title: International Journal of Pattern Recognition and Artificial Intelligence
Abbreviated source title: Int J Pattern Recognit Artif Intell
Volume: 34
Issue: 2
Issue date: February 1, 2020
Publication year: 2020

Article number: 2058001
Language: English
ISSN: 02180014
CODEN: IJPIEI
Document type: Journal article (JA)
Publisher: World Scientific
Abstract: The directional logging-while-drilling measurements enable to monitor the distance to formation boundaries and their orientation and facilitate proactive well placement, and thus can provide directionality information useful in detecting physical parameters such as bed boundaries, formation dip and formation azimuth, so the oil and gas recovery can be greatly improved. The characteristics of a kind of electromagnetic wave resistivity logging while drilling (LWD) tool with tilted antennas are computed via the magnetic-current-source dyadic Green's function for horizontally stratified anisotropic media. The current characteristic at the formation interface of the tilted antennas is compared with that of the axial antenna, and how the LWD tool with tilted antennas to detect the formation interface position and orientation is revealed. The amplitude-attenuation and phase-shift characteristics of LWD tool with tilted antennas are analyzed, and how to design the angle of tilted antenna is presented. The relationship between the emitting frequency and emitting-receiving antenna space parameters is expounded, and the emitting-receiving antenna space parameter suitable for different frequencies is presented. The detection characteristic of the electromagnetic wave measuring instrument is studied. For the highly deviated well formation model, the directional response characteristics of the different relative dip angle isotropic and anisotropic formation are numerically simulated and analyzed. The directional response characteristics of the two kinds of coil arrangement (unilateral arrangement and symmetrical arrangement) are analyzed by numerical simulation, and the solution to reduce or eliminate the influence of the directional response of the isotropy on the directional response is obtained. The conclusions obtained by theoretical analysis and numerical simulation provide a guide for the instrument principle research and application. © 2020 World Scientific Publishing Company.
Number of references: 17
Main heading: Logging while drilling
Controlled terms: Directive antennas - Numerical models - Infill drilling - Receiving antennas - Anisotropy - Anisotropic media - Circular waveguides - Electromagnetic logging - Electromagnetic waves
Uncontrolled terms: Detection characteristics - Directional response - Directional well - Dyadic green's functions - Magnetic current sources - Research and application - Resistivity logging while drillings - Response characteristic
Classification code: 511.1 Oil Field Production Operations - 512.1.2 Petroleum Deposits : Development Operations - 701 Electricity and Magnetism - 711 Electromagnetic Waves - 714.3 Waveguides - 921 Mathematics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1142/S021800142058001X
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

412. Gait control method of multifunctional outdoor intelligent mobile robot based on parameter identification

Accession number: 20213910944819
Authors: Sun, Yuhong (1)
Author affiliation: (1) Xi'An Shiyou University, Shaanxi Province, Xi'an; 710065, China
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Issue title: Proceedings - 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
Conference date: November 7, 2020 - November 8, 2020
Conference location: Sanya, China
Conference code: 171603

Sponsor: Hainan Tropical Ocean University; Huaian Numerical Control Association; Jiangsu Key Laboratory of Advanced Manufacturing Technology; Shenzhen Research Institute of Central South University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to effectively improve the gait control accuracy and control efficiency of the multifunctional outdoor intelligent mobile robot, a multifunctional outdoor intelligent mobile robot gait control method based on parameter identification is proposed. Based on the construction of the gait stability model of the outdoor intelligent mobile robot, a three-layer motion control system of the outdoor intelligent mobile robot integrating time and position control and motion control is designed. Combining the principle of parameter identification, the robot moves the gait virtual constraint. Adjust the posture characteristics of the robot gait control layer, establish the relationship between posture and structure, adopt distributed priority experience playback technology, establish an efficient robot gait control method, and realize intelligent mobile robot gait control. The simulation results show that the proposed control method can enable the multifunctional outdoor intelligent mobile robot to overcome the interference of uneven terrain, effectively control the gait changes, and improve the efficiency of gait control. © 2020 IEEE.
Number of references: 15
Main heading: Motion control
Controlled terms: Mobile robots - Parameter estimation - Efficiency - Intelligent robots - Position control
Uncontrolled terms: Control efficiency - Control methods - Gait control - Gait stabilities - Intelligent mobile robot - Three-layer - Uneven terrain - Virtual constraints
Classification code: 731.3 Specific Variables Control - 731.5 Robotics - 731.6 Robot Applications - 913.1 Production Engineering
DOI: 10.1109/ICRIS52159.2020.00012
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

413. Casing Damage Classification Method Using Random Forest Algorithms (*Open Access*)

Accession number: 20200608140007
Authors: Xue, Jijun (1)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, Xi'an, China
Corresponding author: Xue, Jijun(xue_jijun@163.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
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Part number: 1 of 1
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Issue title: 2nd International Symposium on Big Data and Applied Statistics, ISBDAS 2019
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Article number: 012131
Language: English
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E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2019 2nd International Symposium on Big Data and Applied Statistics, ISBDAS 2019
Conference date: September 20, 2019 - September 22, 2019
Conference location: Dalian, China
Conference code: 157101
Publisher: IOP Publishing Ltd
Abstract: The classification of casing damage is one of the important links in casing damage detection. Due to the large number of feature parameters of casing damage, the classification accuracy and the generalization performance of decision tree is poor. Therefore, for improving the prediction accuracy of casing damage classification, considering the data type of oil and gas well casing damage, the paper proposed a casing damage classification method based on random forest algorithms to predict the casing damage classification. The experiment results show that, the prediction accuracy of the method is 95%, which proves the accuracy and reliability of the casing damage classification method using random forest algorithms. © Published under licence by IOP Publishing Ltd.
Number of references: 13
Main heading: Damage detection
Controlled terms: Decision trees - Forecasting

Uncontrolled terms: Casing damage - Classification accuracy - Data type - Feature parameters - Generalization performance - Oil and gas well - Prediction accuracy - Random forest algorithm
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
Numerical data indexing: Percentage 9.50e+01%
DOI: 10.1088/1742-6596/1437/1/012131
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

414. Research on triaxial array induction logging response in inclined anisotropic formation (*Open Access*)

Accession number: 20203809182379
Authors: Zhang, Miaoyu (1, 2); Wu, Jie (1, 2); Liu, Yanping (1, 2)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Key Laboratory of Shaanxi Province for Gas-Oil Logging Technology, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Zhang, Miaoyu(myzhang@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1617
Part number: 1 of 1
Issue: 1
Issue title: 2nd International Conference on Electronic Engineering and Informatics
Issue date: August 25, 2020
Publication year: 2020
Article number: 012086
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 2nd International Conference on Electronic Engineering and Informatics, EEI 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Lanzhou, China
Conference code: 162560
Publisher: Institute of Physics Publishing
Abstract: The logging response calculation and fast inversion are the key and difficulties for logging data interpretation and formation parameter estimation of the triaxial array induction logging. We transform the formation conductivity from media coordinate to instrument coordinate based on coordinate transformation theory. This paper examines anisotropic response of the triaxial array induction in inclined anisotropic formation by finite element method. The greater the anisotropy coefficient is, the more obvious the curve separation. The apparent conductivity decreases with the increase of dip angle for the coaxial system, but the coplanar system increases. The research results show that the apparent conductivity of the coplanar system appears as obviously positive and negative horns on the horizontal interfaces, which is generated by the accumulated surface charge at the boundary of the layer. © Published under licence by IOP Publishing Ltd.
Number of references: 14
Main heading: Induction logging
Controlled terms: Anisotropy
Uncontrolled terms: Anisotropic formations - Anisotropic response - Anisotropy coefficients - Apparent conductivity - Co-axial systems - Co-ordinate transformation - Curve separation - Research results
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1088/1742-6596/1617/1/012086
Funding Details: Number: 2018JM4014, Acronym: -, Sponsor: -; Number: 41704106, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This article is supported by the National Natural Science Foundation of China under Grant No.41704106 and Shaanxi Natural science foundation research under Grant No.2018JM4014.
Compendex references: YES
Open Access type(s): All Open Access, Gold

Database: Compendex
Data Provider: Engineering Village

415. Design of Convolution Operation Accelerator based on FPGA

Accession number: 20211210102094
Authors: Kang, Lei (1); Li, Hui (1); Li, Xin (1); Zheng, Haowei (1)
Author affiliation: (1) Xi'an Shiyou University, School of Computing, Xi'an, China
Source title: Proceedings - 2020 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Abbreviated source title: Proc. - Int. Conf. Mach. Learn., Big Data Bus. Intell., MLBDBI
Part number: 1 of 1
Issue title: Proceedings - 2020 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Issue date: October 2020
Publication year: 2020
Pages: 80-84
Article number: 9360939
Language: English
ISBN-13: 9781728196381
Document type: Conference article (CA)
Conference name: 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Conference date: October 23, 2020 - October 25, 2020
Conference location: Chengdu, China
Conference code: 167501
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Because of the high complexity and long time of CPU in convolution operation, the power consumption of GPU is high and it can not be deployed to small hardware devices. Field Programmable Logic Gate Array (FPGA) has parallelism and fast speed , Low power consumption and etc. Therefore, this paper proposes an improved RLeNet model, which optimizes model parameters and used a parallel technology to accelerate CNN hardware. The improved model parameter data volume is reduced to 3.2% of the original. Under the MNIST data set, the accuracy of the prediction result is 98.5%. Finally, on the Xilinx Nexys 4 DDR: Artix-7 development board, the prediction process of the convolutional neural network for handwriting recognition is implemented. When the system predicts with a 200MHz clock, the time to predict a picture is 31.8μs. © 2020 IEEE.
Number of references: 11
Main heading: Convolution
Controlled terms: Character recognition - Convolutional neural networks - Field programmable gate arrays (FPGA) - Integrated circuit design - Electric power utilization - Forecasting
Uncontrolled terms: Field programmable logic - Handwriting recognition - Hardware devices - High complexity - Low-power consumption - Model parameters - Parallel technology - Prediction process
Classification code: 706.1 Electric Power Systems - 714.2 Semiconductor Devices and Integrated Circuits - 716.1 Information Theory and Signal Processing - 721.2 Logic Elements
Numerical data indexing: Frequency 2.00e+08Hz, Percentage 3.20e+00%, Percentage 9.85e+01%
DOI: 10.1109/MLBDBI51377.2020.00021
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

416. Production Performance Analysis of Su-6 Well Block in Sulige Gas Field, Ordos Basin, China (*Open Access*)

Accession number: 20205009608648
Authors: Sun, Lin (1); Li, Xianwen (2); Chen, Baochun (2); Gu, Yonghong (2); Wang, Wenxiong (2); Zhao, Jinsheng (3)
Author affiliation: (1) Library Xi'an Shiyou University, Xi'an, China; (2) Oil and Gas Technology Research Institute, PetroChina Changqing Oilfield Company, Xi'an, China; (3) School of Petroleum Engineering, Xi'an Shiyou University, Xi'an, China
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.
Volume: 603
Part number: 1 of 1
Issue: 1
Issue title: 2020 3rd International Conference on Energy and Power Engineering
Issue date: November 30, 2020
Publication year: 2020
Article number: 012001
Language: English
ISSN: 17551307
E-ISSN: 17551315
Document type: Conference article (CA)
Conference name: 2020 3rd International Conference on Energy and Power Engineering, EPE 2020
Conference date: September 20, 2020 - September 21, 2020
Conference location: Shanghai, Virtual, China
Conference code: 165442
Publisher: IOP Publishing Ltd
Abstract: As a tight sandstone gas reservoir of Su-6 well block in Sulige gas field, part of the gas wells have a poorer production performance with a faster decline rate of formation pressure and production, which is inconsistent with static reservoir parameters of gas well. In order to improve the productivity of gas well, on the base of static and dynamic classification of 232 gas wells, the reasons of inconformity between production performance and static reservoir parameters are analyzed from the four aspects of sand body connectivity, reservoir heterogeneity, gas saturation and fluid accumulation in wellbore. The results show that the main reasons causing the inconformity are the strong heterogeneity and poor sand body connectivity, and the secondary reasons are fluid accumulation in wellbore and low gas saturation. The results of this paper is of great significance to improve the productivity of gas wells and guide the development of ultra-low permeability gas reservoir. © 2020 Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Gases
Controlled terms: Gas industry - Gas permeability - Natural gas well production - Natural gas wells - Boreholes - Low permeability reservoirs - Oil field equipment - Petroleum reservoir engineering - Productivity
Uncontrolled terms: Dynamic classification - Production performance - Productivity of gas wells - Reservoir heterogeneity - Reservoir parameters - Strong heterogeneities - Tight sandstone gas - Ultra low permeability
Classification code: 511.2 Oil Field Equipment - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 512.2.1 Natural Gas Fields - 522 Gas Fuels - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1088/1755-1315/603/1/012001
Funding Details: Number: 51774236, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: -, Sponsor: Youth Innovation Team Project for Talent Introduction and Cultivation in Universities of Shandong Province;
Funding text: This research is financially supported by the Natural Science Foundation of China (No. 51774236) and the Youth Innovation Team of Shaanxi Universities.
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

417. Intelligent forest fire point automatic location based on reference window

Accession number: 20213910944824
Authors: Li, Siyao (1); Qi, Xinyu (2); Liu, Shaorong (3)
Author affiliation: (1) Bond University, Faculty of Society Design, Gold Coast; QLD; 4226, Australia; (2) Xi'An Shiyou University, School of Economic Management, Xi'an; 710065, China; (3) Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Li, Siyao(lisiyaococo@hotmail.com)
Source title: Proceedings - 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
Abbreviated source title: Proc. - Int. Conf. Robot. Intell. Syst., ICRIS
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
Issue date: November 2020
Publication year: 2020

Pages: 579-582
Language: English
ISBN-13: 9780738124070
Document type: Conference article (CA)
Conference name: 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020
Conference date: November 7, 2020 - November 8, 2020
Conference location: Sanya, China
Conference code: 171603
Sponsor: Hainan Tropical Ocean University; Huaian Numerical Control Association; Jiangsu Key Laboratory of Advanced Manufacturing Technology; Shenzhen Research Institute of Central South University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to improve the accuracy of forest fire automatic location, this paper proposes a new method of forest fire automatic location. According to the characteristics of forest terrain changes, the longitude and latitude of the corresponding fire points in forest fire images are extracted successfully by using the 3D geometric model of reference window. By using the translation method of camera lens optical axis in space, the mapping relationship between plane pixel coordinates and three-dimensional space coordinates is established, which simplifies the actual calculation process. The experimental results show that the method can realize the automatic location of forest fire more accurately. © 2020 IEEE.
Number of references: 6
Main heading: Fires
Controlled terms: Fire hazards - Location - Cameras - Deforestation - Lenses - 3D modeling
Uncontrolled terms: 3D geometric model - Automatic location - Calculation process - Forest fires - Mapping relationships - Terrain changes - Three dimensional space - Translation method
Classification code: 723.2 Data Processing and Image Processing - 741.3 Optical Devices and Systems - 742.2 Photographic Equipment - 821 Agricultural Equipment and Methods; Vegetation and Pest Control - 914.2 Fires and Fire Protection
DOI: 10.1109/ICRIS52159.2020.00147
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

418. Research on sliding mode control of permanent magnet synchronous drive motor

Accession number: 20205109638830
Authors: Yan, Hongliang (1, 2); Li, Leiming (1, 2); Ma, Juju (1, 2); Li, Jiapeng (1, 2)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China; (2) Shaanxi Key Laboratory of Oil and Gas Well Measurement and Control Technology, Xi'An Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Issue date: September 2020
Publication year: 2020
Pages: 384-388
Article number: 9239780
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to improve the control performance of the continuous-wave mud pulser drive motor speed control system and enhance its robustness, this paper proposes an improved variable exponential reaching law. It does not add new parameters on the basis of the traditional reaching law, but achieves better chattering reduction and

disturbance rejection. Its feasibility has proved theoretically in this paper. In order to further verify the superiority of the improved variable exponential reaching law, a speed loop sliding mode controller was designed and simulated based on it. Through the comparison of simulation results, the speed loop sliding mode controller designed based on the reaching law proposed in this paper can effectively improve response speed, disturbance rejection performance of the motor speed control system and reduce chattering. © 2020 IEEE.
Number of references: 17
Main heading: Sliding mode control
Controlled terms: Electric machine control - Permanent magnets - Disturbance rejection - Exponential functions - Robustness (control systems) - Speed regulators - Synchronous motors - Controllers - Speed - Speed control
Uncontrolled terms: Chattering reductions - Continuous Wave - Control performance - Disturbance rejection performance - Exponential reaching law - Motor-speed control - Permanent magnet synchronous - Sliding mode controller
Classification code: 704.1 Electric Components - 705.3.1 AC Motors - 731 Automatic Control Principles and Applications - 731.1 Control Systems - 731.2 Control System Applications - 731.3 Specific Variables Control - 732.1 Control Equipment - 921 Mathematics
DOI: 10.1109/ICCNEA50255.2020.00085
Funding Details: Number: 15JS084, Acronym: -, Sponsor: -; Number: YCS20113034, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: ACKNOWLEDGMENT This paper is funded by Shaanxi Provincial Department of Education Key Laboratory Project (15JS084), Xi'an Shiyou University Graduate Creative Practice Ability Training Program (YCS20113034) and Xi'an Shiyou University Graduate Innovation and Practice Ability Training Program.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

419. Survey of image segmentation methods based on clustering

Accession number: 20210309780435
Authors: Cheng, Guojian (1); Liu, Lianhong (1)
Author affiliation: (1) School of Computer Science of xi'An, Shiyou University, China
Corresponding author: Liu, Lianhong(gjcheng@xsyu.edu.cn)
Source title: Proceedings of 2020 IEEE International Conference on Information Technology, Big Data and Artificial Intelligence, ICIBA 2020
Abbreviated source title: Proc. IEEE Int. Conf. Inf. Technol., Big Data Artif. Intell., ICIBA
Part number: 1 of 1
Issue title: Proceedings of 2020 IEEE International Conference on Information Technology, Big Data and Artificial Intelligence, ICIBA 2020
Issue date: November 6, 2020
Publication year: 2020
Pages: 1111-1115
Article number: 9277287
Language: English
ISBN-13: 9781728152240
Document type: Conference article (CA)
Conference name: 2020 IEEE International Conference on Information Technology, Big Data and Artificial Intelligence, ICIBA 2020
Conference date: November 6, 2020 - November 8, 2020
Conference location: Chongqing, China
Conference code: 165846
Sponsor: Chengdu Global Union Academy 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 the rapid development and application of clustering algorithms, the problem of image segmentation has attracted more and more scholars and industry attention. This paper studies the clustering-based image segmentation method, summarizes the basic idea, and divides it into two categories, namely partition method and agglomeration method. The typical algorithms Kmeans algorithm, CLARANS algorithm, mean shift algorithm and DBSCAN algorithm of these two methods are introduced in detail. The advantages and limitations of these four methods are analyzed. Finally, it points out the future research trend of clustering algorithms and gives conclusions. © 2020 IEEE.
Number of references: 16

Main heading: Image segmentation
Controlled terms: Clustering algorithms
Uncontrolled terms: DBSCAN algorithm - Development and applications - Mean shift algorithm - Partition methods - Research trends - Segmentation methods
Classification code: 903.1 Information Sources and Analysis
DOI: 10.1109/ICIBA50161.2020.9277287
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

420. Super-resolution reconstruction of rock thin-section image based on SinGAN

Accession number: 20210809946292
Authors: Cheng, Guojian (1); Zhang, Fulin (1); Qiang, Xinjian (1)
Author affiliation: (1) Xi'An Shiyou University, School of Computer Science, Xi'an, China
Part number: 1 of 1
Issue title: ITAIC 2020 - IEEE 9th Joint International Information Technology and Artificial Intelligence Conference
Issue date: 2020
Publication year: 2020
Pages: 786-790
Article number: 9338894
Language: English
ISSN: 26932865
Document type: Conference article (CA)
Conference name: 9th IEEE Joint International Information Technology and Artificial Intelligence Conference, ITAIC 2020
Conference date: December 11, 2020 - December 13, 2020
Conference location: Chongqing, China
Conference code: 166943
Sponsor: Chengdu Global Union Academy of Science and Technology; Chongqing Geeks Education Technology Co., Ltd; Chongqing Global Union Academy of Science and Technology; Chongqing Jiaotong University; IEEE Beijing Section
Abstract: The rock thin section images are of great significance to the study of petroleum geological characteristics and oil and gas exploration. Due to the limitations of various factors, the obtained images of rock thin-sections often have low resolution, which limits the researchers' grasp of their detailed information to some extent. The traditional super-resolution algorithm of neural network will need a large amount of data as a training set, in order to improve rock thin-section image super-resolution reconstruction algorithm texture detail information reduction ability, the paper using single image generative adversarial network for rock thin-section image super-resolution reconstruction, does not need to input a large number of data sets, of single image super-resolution reconstruction image. Rock cast thin section images from an oil field area in Ordos basin were used for training, and peak signal-to-noise ratio (PSNR) and structural similarity (SSIM) evaluation indexes were used for model evaluation. The experimental results show that the super-resolution image processing based on this method has good visual effects and evaluation indexes. © 2020 IEEE.
Number of references: 15
Main heading: Rocks
Controlled terms: Generative adversarial networks - Image reconstruction - Signal to noise ratio - Optical resolving power - Image enhancement - Oil fields - Textures - Petroleum prospecting
Uncontrolled terms: Geological characteristics - Oil and gas exploration - Peak signal to noise ratio - Single-image super-resolution reconstruction - Structural similarity - Super resolution algorithms - Super resolution reconstruction - Super-resolution image processing
Classification code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence - 741.1 Light/Optics
DOI: 10.1109/ITAIC49862.2020.9338894
Funding Details: Number: 2016ZX05050, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This work was supported by the National Science and Technology Major Project: Large-scale oil and gas field and coalbed methane development (2016ZX05050)
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

421. Kernel Subspace Clustering with Block Diagonal Prior

Accession number: 20211210102135
Authors: Yang, Yifang (1); Wang, Tong (1)
Author affiliation: (1) College of Science and Xi'an Shiyou University, Xi'an, China
Source title: Proceedings - 2020 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Abbreviated source title: Proc. - Int. Conf. Mach. Learn., Big Data Bus. Intell., MLBDBI
Part number: 1 of 1
Issue title: Proceedings - 2020 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Issue date: October 2020
Publication year: 2020
Pages: 367-370
Article number: 9360989
Language: English
ISBN-13: 9781728196381
Document type: Conference article (CA)
Conference name: 2nd International Conference on Machine Learning, Big Data and Business Intelligence, MLBDBI 2020
Conference date: October 23, 2020 - October 25, 2020
Conference location: Chengdu, China
Conference code: 167501
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: We present in this paper a kernel subspace clustering with block diagonal prior (KSCBD) method for nonlinear data analysis. Unlike most existing block diagonal constrained subspace clustering methods can only be performed explicitly on the original data space, our KSCBD embed the block diagonal prior into the kernel Hilbert space. Specifically, our KSCBD first projects the data to a high-dimension linear space by kernel method. Then, the block diagonal prior is embedded to the kernel Hilbert space for keeping the block diagonal structure. Experimental results on both synthetic and real-world data sets demonstrate the effectiveness of the proposed algorithm. © 2020 IEEE.
Number of references: 20
Main heading: Vector spaces
Controlled terms: Clustering algorithms - Hilbert spaces
Uncontrolled terms: Block diagonal - High dimensions - Kernel Hilbert space - Kernel methods - Linear spaces - Nonlinear data analysis - Real-world - Sub-Space Clustering
Classification code: 903.1 Information Sources and Analysis - 921 Mathematics
DOI: 10.1109/MLBDBI51377.2020.00078
Funding Details: Number: -, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: ACKNOWLEDGMENT This work was supported in part by Natural Science Basic Research Plan in Shaanxi Province of China (No.2020JM-543), in part by 2019 college students' innovation and entrepreneurship training project.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

422. Vibration testing of a certain turbojet engine using the power spectrum analysis (*Open Access*)

Accession number: 20202108688695
Authors: Huang, Jingjing (1)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Huang, Jingjing(huangjingjing@xsyu.edu.cn)
Source title: Journal Europeen des Systemes Automatises
Abbreviated source title: J. Eur. Syst. Autom.
Volume: 53
Issue: 1
Issue date: February 1, 2020
Publication year: 2020

Pages: 87-93
Language: English
ISSN: 12696935
E-ISSN: 21167087
Document type: Journal article (JA)
Publisher: International Information and Engineering Technology Association
Abstract: This study conducts a vibration testing of a turbojet engine and explores the vibration causes. To this end, taking one certain turbojet engine as the research object, the power spectrum analysis (PSA) was performed on the collected vibration signals from the compressor casing and turbine casing of the engine under the rated condition of 0.8. Then, the state characteristic parameters of the rotating machinery were applied to the vibration diagnosis of the engine rotor system. Finally, corresponding vibration reducing measures were proposed. Studies have found that the vibration caused by the unbalanced mass of the main rotor of the turbojet engine is obvious; there is the misalignment of the rotor main shaft or the uneven radial stiffness of the rotor; turbine rotor seal may have dynamic and static rubbing faults. During the commissioning process of turbojet engine, the PSA is conductive to quickly identifying the type, location, and degree of rotor system faults, and relevant vibration reduction measures should be taken in time. The research findings lay the foundation for intelligent fault analysis of the engine. © 2020 Lavoisier. All rights reserved.
Number of references: 25
Main heading: Spectrum analysis
Controlled terms: Vibration analysis - Power spectrum - Turbojet engines
Uncontrolled terms: Commissioning process - Compressor casing - Radial stiffness - State characteristics - Vibration diagnosis - Vibration reduction measures - Vibration signal - Vibration testing
Classification code: 653.1 Aircraft Engines, General
DOI: 10.18280/jesa.530111
Funding Details: Number: 2019JQ-462, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: The authors wish to acknowledge the Scientific Research Program Funded by the Natural Science Foundation of Shaanxi Province of China (Program No. 2019JQ-462).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

423. Reasearch of shunt active power filter based on disturbance rejection controller

Accession number: 20205109638834
Authors: Yan, Hongliang (1, 2); Li, Jiapeng (1, 2); Li, Leiming (1, 2); Ma, Juju (1, 2)
Author affiliation: (1) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, Xi'An Shiyou University, Xi'an, China; (2) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
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Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Aiming at the problems of overshoot and static error in the shunt active power filter (SAPF) direct current side voltage control, a new control strategy based on linear active disturbance rejection control(LADRC) is proposed.

Its mathematical model is established by SAPF structural analysis, and then a second-order expanded state observer is designed and the error feedback unit is linearized. Linear active disturbance rejection controller applied to APF direct current side voltage control. The simulation results show that the application of linear active disturbance rejection control can effectively improve the compensation performance and dynamic response speed of SAPF compared with traditional PI control strategies, which verifies the effectiveness of the control method. © 2020 IEEE.
Number of references: 12
Main heading: Controllers
Controlled terms: Active filters - Disturbance rejection - Voltage control
Uncontrolled terms: Active disturbance rejection controller - Compensation performance - Control strategies - Expanded state observer - Linear active disturbance rejection controls - PI control strategy - Shunt active power filter (SAPF) - Shunt active power filters
Classification code: 703.2 Electric Filters - 731 Automatic Control Principles and Applications - 731.3 Specific Variables Control - 732.1 Control Equipment
DOI: 10.1109/ICCNEA50255.2020.00079
Funding Details: Number: YCS20113032, Acronym: -, Sponsor: -; Number: 15JS084, Acronym: -, Sponsor: -;
Funding text: ACKNOWLEDGMENT The project is funded by the Shaanxi Provincial Department of Education Key Laboratory Project (15JS084), the Graduate Innovation and Practical Ability Training Project of Xi'an Shiyou University (YCS20113032) and the Graduate Innovation and Practical Ability Training Program of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

424. Implementation smart contract with finite state machines

Accession number: 20210309786181
Authors: Yang, Xiaojing (1); Liu, Jinshan (1); Li, Xiaohe (1)
Author affiliation: (1) College of Computer Science, Xi'an Shiyou University, Xi'an, China
Source title: ACM International Conference Proceeding Series
Abbreviated source title: ACM Int. Conf. Proc. Ser.
Part number: 1 of 1
Issue title: Proceedings of ICASIT 2020: 2020 International Conference on Aviation Safety and Information Technology
Issue date: October 14, 2020
Publication year: 2020
Pages: 404-408
Language: English
ISBN-13: 9781450375764
Document type: Conference article (CA)
Conference name: 2020 International Conference on Aviation Safety and Information Technology, ICASIT 2020
Conference date: October 14, 2020 - October 16, 2020
Conference location: Weihai, China
Conference code: 165956
Sponsor: China Academy of Civil Aviation Science and Technology; Nanjing University of Aeronautics and Astronautics; Wuhan University
Publisher: Association for Computing Machinery
Abstract: Smart contract is an event-driven code contract with state attributes, which has been widely concerned and studied with the deep development of blockchain technology. This article proposes a new smart contract architecture, and discusses the main functions implemented at each layer and some of the key technologies and their operation mechanism in the blockchain. On this basis, it is attempted to establish a core description of commitment, and use a finite state machine to implement a formal description of smart contracts with the support of actions and finite periods. Finally, a commercial contract is implemented on the blockchain as an example to verify the feasibility of this standardized definition of smart contracts. © 2020 ACM.
Number of references: 9
Main heading: Smart contract
Controlled terms: Blockchain
Uncontrolled terms: Commercial contracts - Contract architecture - Event-driven - Formal Description - Key technologies - Operation mechanism
Classification code: 723.3 Database Systems - 902.3 Legal Aspects
DOI: 10.1145/3434581.3434734
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village

425. PM2.5 Prediction Based on XGBoost

Accession number: 20214010986082
Authors: Zhang, Liumei (1); Ji, Yangna (1); Liu, Tianshi (1); Li, Jiao (1)
Author affiliation: (1) Xi'An Shiyou University, School of Computer Science, Xi'an, China
Source title: Proceedings - 2020 7th International Conference on Information Science and Control Engineering, ICISCE 2020
Abbreviated source title: Proc. - Int. Conf. Inf. Sci. Control Eng., ICISCE
Part number: 1 of 1
Issue title: Proceedings - 2020 7th International Conference on Information Science and Control Engineering, ICISCE 2020
Issue date: December 2020
Publication year: 2020
Pages: 1011-1014
Language: English
ISBN-13: 9781728164069
Document type: Conference article (CA)
Conference name: 7th International Conference on Information Science and Control Engineering, ICISCE 2020
Conference date: December 18, 2020 - December 20, 2020
Conference location: Changsha, Hunan, China
Conference code: 171872
Sponsor: et al.; Hunan University; Hunan University of Humanities, Science and Technology; Swinburne University of Technology; Wayne State University; Xiamen University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Haze pollution is a serious weather condition which occurs frequently in mainland China. As there has been an increasing worldwide research interest around topics in environment protection and human health, PM2.5 concentration is regarded as a vital index to reflect the air quality. The current PM2.5 prediction algorithm has the problems of single index and insufficient features. In this paper, based on XGBoost, a PM2.5 prediction model is proposed. Such model adopts the random forest algorithm for feature selection. Then, the optimal feature subset that affects PM2.5 concentration is selected. The experiment is conducted on real dataset of daily air quality and weather observations in Beijing from 2017 to 2019. The results show that the daily average concentration of PM2.5 can be accurately predicted with root mean square error at 8.63, and correlation at 95.41%. © 2020 IEEE.
Number of references: 10
Main heading: Air quality
Controlled terms: Decision trees - Random forests - Forecasting - Mean square error
Uncontrolled terms: Environment protection - Haze pollutions - Human health - Mainland chinas - PM2.5 concentration - Pm2.5 prediction - Prediction-based - Random forests - Research interests - Xgboost algorithm
Classification code: 451.2 Air Pollution Control - 723.4.2 Machine Learning - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 922.2 Mathematical Statistics - 961 Systems Science
Numerical data indexing: Percentage 9.541E+01%
DOI: 10.1109/ICISCE50968.2020.00207
Funding Details: Number: 618023 01, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 201 9JQ-056, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: ACKNOWLEDGMENT This work is supported in part by the scholarship from National Natural Science Foundation of China (No. 618023 01), Shaanxi Natural Science Foundation of China (No. 201 9JQ-056).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

426. A Fault Diagnosis Model of Pumping Unit Based on BP Neural Network

Accession number: 20211010055508
Authors: Zhang, Liumei (1); Du, Qiuyuan (1); Liu, Tianshi (1); Li, Jiao (1)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Networking and Network Applications, NaNA 2020
Abbreviated source title: Proc. - Int. Conf. Netw. Netw. Appl., NaNA

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Issue title: Proceedings - 2020 International Conference on Networking and Network Applications, NaNA 2020
Issue date: December 2020
Publication year: 2020
Pages: 454-458
Article number: 9353831
Language: English
ISBN-13: 9781728189543
Document type: Conference article (CA)
Conference name: 2020 International Conference on Networking and Network Applications, NaNA 2020
Conference date: December 11, 2020 - December 14, 2020
Conference location: Haikou, China
Conference code: 167352
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: At present, oil recovery is generally carried out by pumping unit in oilfield development. Monitoring working status of pumping unit in real time is vital to avoid inefficient production, prevent and control hidden dangers. The condition diagnosis is one of the important contents which often rely on analyzing and classifying the dynamometer card. The traditional method of dynamometer card identification is insufficient to process the huge dynamometer card data in real time. Moreover, the experience and knowledge of the onsite engineers will affect the accuracy of identification. Therefore, in this paper, Freeman chain code and differential code are adopted to extract the characteristics of the dynamometer card data of the pumping unit. Then BP neural network based diagnosis model is proposed to realize the automatic identification of the fault type of the pumping unit according to the dynamometer card. The experimental result shows that the proposed model achieves an accuracy of 94.79%, thus can be used to assist decision making in actual production. © 2020 IEEE.
Number of references: 10
Main heading: Network coding
Controlled terms: Dynamometers - Automation - Decision making - Fault detection - Pumping plants - Pumps - Neural networks
Uncontrolled terms: BP neural networks - Diagnosis model - Dynamometer card - Fault diagnosis model - Fault types - Freeman chain code - Oil recoveries - Pumping unit
Classification code: 446 Waterworks - 618.2 Pumps - 716.1 Information Theory and Signal Processing - 731 Automatic Control Principles and Applications - 912.2 Management - 943.1 Mechanical Instruments
Numerical data indexing: Percentage 9.48e+01%
DOI: 10.1109/NaNA51271.2020.00083
Funding Details: Number: -, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 61802301, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work is supported in part by the scholarship from National Natural Science Foundation of China (No.61802301), and Shaanxi Natural Science Foundation of China (No.2019JQ-056).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

427. Unravelling transport in complex natural fractures with fractal geometry: A comprehensive review and new insights

Accession number: 20201608434667
Authors: Babadagli, T. (1, 2)
Author affiliation: (1) Xi'an Shiyou University, China; (2) University of Alberta, Canada, Canada
Source title: Journal of Hydrology
Abbreviated source title: J. Hydrol.
Volume: 587
Issue date: August 2020
Publication year: 2020
Article number: 124937
Language: English
ISSN: 00221694
CODEN: JHYDA7
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands

Abstract: Quantitatively describing complex natural systems and their processes is a challenging task; additionally, the random nature of these processes adds more difficulty to this problem. This paper considers fracture networks as a system and the concepts of percolation theory and fractal geometry are combined to define the conductivity characteristics of such structures. Correlations between fracture network properties and network permeability are searched using the fractal dimensions (box-counting, mass, correlation dimensions) of different fracture network features (density, length, orientation, connectivity, distribution, anisotropy). The conditions of a strong relationship with different fractal characteristics and scale-dependency of correlations are addressed. The results will be useful in defining universal constants in scaling equations used to model transport processes in complex fracture network systems. © 2020 Elsevier B.V.
Number of references: 61
Main heading: Fractal dimension
Controlled terms: Complex networks - Mechanical permeability - Fracture - Petroleum reservoir engineering - Solvents - Percolation (solid state)
Uncontrolled terms: Correlation dimensions - Fractal characteristics - Modeling transport - Natural fracture - Network permeability - Percolation theory - Scaling equations - Universal constants
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 722 Computer Systems and Equipment - 803 Chemical Agents and Basic Industrial Chemicals - 921 Mathematics - 951 Materials Science
DOI: 10.1016/j.jhydrol.2020.124937
Funding Details: Number: -, Acronym: NSERC, Sponsor: Natural Sciences and Engineering Research Council of Canada; Number: -, Acronym: -, Sponsor: Saudi Aramco; Number: RES0033730, Acronym: -, Sponsor: BASF; Number: -, Acronym: -, Sponsor: Suncor Energy Incorporated;
Funding text: This research was conducted under the author's NSERC Industrial Research Chair in Unconventional Oil Recovery (industrial partners are Petroleum Development Oman, Total E&P Recherche Development, Husky Energy, Saudi Aramco, CNRL, Suncor, and BASF) and an NSERC Discovery Grant (No: RES0033730). These supports are gratefully acknowledged.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

428. Research and Analysis of Drilling String Vibration Signals

Accession number: 20204809539079
Authors: Li, Bilin (1); Gao, Yi (1); Li, Ruibing (1)
Author affiliation: (1) Xi'an Shiyou University, School of Electronic Engineering, Xi'an, China
Source title: 2020 IEEE International Conference on Mechatronics and Automation, ICMA 2020
Abbreviated source title: IEEE Int. Conf. Mechatronics Autom., ICMA
Part number: 1 of 1
Issue title: 2020 IEEE International Conference on Mechatronics and Automation, ICMA 2020
Issue date: October 13, 2020
Publication year: 2020
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Article number: 9233640
Language: English
ISBN-13: 9781728164151
Document type: Conference article (CA)
Conference name: 17th IEEE International Conference on Mechatronics and Automation, ICMA 2020
Conference date: October 13, 2020 - October 16, 2020
Conference location: Beijing, China
Conference code: 164506
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Drilling tools are the main components of the drilling system, including drill bits and drill rods. During the drilling process, due to the collision between the drill bit and different formations, the drill string often vibrates, which causes damage to the drill bit and has a serious negative impact on drilling. Therefore, the research on the vibration of drilling tools is particularly important. This paper focuses on the generation mechanism, performance phenomenon, negative effects, judgment and improvement measures of three forms of drilling tool vibration: longitudinal vibration, torsional vibration and lateral vibration. The three vibration signal research methods: time domain method, spectrum analysis method and wavelet transform method are also analyzed. © 2020 IEEE.
Number of references: 5
Main heading: Drills

Controlled terms: Wavelet transforms - Bits - Infill drilling - Spectrum analysis - Signal analysis - Time domain analysis - Vibration analysis
Uncontrolled terms: Drilling strings - Generation mechanism - Improvement measure - Lateral vibrations - Longitudinal vibrations - Research and analysis - Time-domain methods - Torsional vibration
Classification code: 511.1 Oil Field Production Operations - 603.2 Machine Tool Accessories - 716.1 Information Theory and Signal Processing - 921 Mathematics - 921.3 Mathematical Transformations
DOI: 10.1109/ICMA49215.2020.9233640
Funding Details: Number: 2018JM5064, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 51604226, Acronym: -, Sponsor: -;
Funding text: This paper is supported by The natural science funds of China (51604226); The natural science funds of Shaanxi Province (2018JM5064).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

429. Video Logging Casing Damage Image Recognition Based on GA-BP Neural Network (*Open Access*)

Accession number: 20202808920565
Authors: Hu, Hongtao (1); Cheng, Yiyao (1)
Author affiliation: (1) School of Computer Science Xi'an Shiyou University, Xi'an, China
Corresponding author: Hu, Hongtao(huhongtao@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1550
Part number: 3 of 6
Issue: 3
Issue title: 2020 4th International Workshop on Advanced Algorithms and Control Engineering, IWAACE 2020 - Machine Learning, Intelligent Data Analysis and Data Mining
Issue date: June 15, 2020
Publication year: 2020
Article number: 032089
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 4th International Workshop on Advanced Algorithms and Control Engineering, IWAACE 2020
Conference date: February 21, 2020 - February 23, 2020
Conference location: Shenzhen, China
Conference code: 161276
Publisher: Institute of Physics Publishing
Abstract: Oil casing damage detection is an important work to maintain the normal production in the oil field. Currently, the Back Propagation (BP) neural network is a frequently used method to automatically identify the casing damage. However, the BP neural network can only approach the local minimum, furthermore the learning speed is slow, and the structure selection can't be determined accurately. Therefore, in this paper, a recognition method based on the optimization of initial threshold and initial weight of BP neural network through genetic algorithm (GA) is proposed to improve the accuracy and efficiency of neural network recognition. Based on the oil casing damage image samples, this paper firstly constructs a feature parameter table of three damage types, and then analyzes the main components of the obtained feature parameters to reduce the dimensions, and finally builds a GA-BP neural network classifier. Using the construction result of feature parameters as the network's input parameters, the experimental results show that the accuracy rate of GA-BP neural network is 78.67%, while the accuracy rate of BP neural network is 75.22%, indicating that the recognition result based on GA-BP neural network is better. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Damage detection
Controlled terms: Neural networks - Genetic algorithms - Backpropagation - Oil fields - Image recognition
Uncontrolled terms: Back propagation neural networks - BP neural networks - Feature parameters - Ga-bp neural networks - Neural network recognition - Oil casing damages - Recognition methods - Structure selection
Classification code: 512.1.1 Oil Fields - 723.4 Artificial Intelligence

Numerical data indexing: Percentage 7.52e+01%, Percentage 7.87e+01%
DOI: 10.1088/1742-6596/1550/3/032089
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

430. Research on Application of Density-Based Clustering Algorithm in Aircraft Formation Analysis

Accession number: 20211210116143
Authors: Zhang, Xianwei (1); Zhang, Lu (1)
Author affiliation: (1) School of Computing, Xi'an Shiyou University, Xi'an, Shaanxi, China
Corresponding author: Zhang, Lu(1751646085@qq.com)
Source title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Abbreviated source title: Proc. - Int. Conf. Inf. Sci., Comput. Technol. Transp., ISCTT
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Issue title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Issue date: November 2020
Publication year: 2020
Pages: 417-421
Article number: 9363811
Language: English
ISBN-13: 9781728185750
Document type: Conference article (CA)
Conference name: 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Conference date: November 13, 2020 - November 15, 2020
Conference location: Shenyang, China
Conference code: 167693
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: The joint combat of multiple fighter formations is an important means of attack in modern warfare. We can respond in a timely manner if the enemy's flight formations can be predicted in advance. That is significant to our combat deployment and countermeasures. Based on the needs and characteristics of aircraft formation analysis and prediction, this paper uses a density-based clustering algorithm to automatically identify flight formations, and uses a large amount of real aircraft data for testing. The test results of the examples show that the proposed method can be more accurate to identify aircraft flying in formation. © 2020 IEEE.
Number of references: 12
Main heading: Aircraft
Controlled terms: Clustering algorithms
Uncontrolled terms: Aircraft flying - Aircraft formations - Combat deployments - Density-based clustering algorithms - Flight formation - Large amounts - Modern warfare - Real aircraft
Classification code: 652.1 Aircraft, General - 903.1 Information Sources and Analysis
DOI: 10.1109/ISCTT51595.2020.00078
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

431. The co-prime order graph associated with a finite group

Accession number: 20210002117
Authors: Ma, Xuanlong (1); Wang, Zhonghua (1)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Xi'an; 710065, China
Source title: arXiv
Abbreviated source title: arXiv
Issue date: November 26, 2020
Publication year: 2020

Language: English
E-ISSN: 23318422
Document type: Preprint (PP)
Publisher: arXiv
Abstract: Let G be a finite group. The co-prime order graph of G is the graph whose vertex set is G, and two distinct vertices x, y are adjacent if gcd(o(x), o(y)) is either 1 or a prime, where o(x) and o(y) are the orders of x and y, respectively. In this paper, we characterize all finite groups whose co-prime order graphs are complete and classify all finite groups whose co-prime order graphs are planar. Also, we compute the vertex-connectivity of the co-prime order graph of a cyclic group, a dihedral group and a generalized quaternion group, which answers a question by Banerjee (2019). Finally, we prove that, for a fixed positive integer k, there are finitely many finite groups whose co-prime order graphs have (non)orientable genus k. As applications, we classify all finite groups whose co-prime order graphs have (non)orientable genus one and two.MSC Codes 05C25, 05C40 © 2020, CC BY.
Number of references: 24
Main heading: Graphic methods
Controlled terms: Graph theory
Uncontrolled terms: Co-prime order graph - Cyclic group - Dihedral groups - Finite groups - Genus - Order graph - Orientable genus - Prime orders - Vertex connectivity - Vertex set
Classification code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory
Compendex references: YES
Preprint ID: 2011.13547v2
Preprint source website: https://arxiv.org
Preprint ID type: ARXIV
Database: Compendex
Data Provider: Engineering Village

432. Forming and stripping of the wall film and the influence on gas–liquid separation

Accession number: 20201208318715
Authors: Yuan, Shuxia (1); Fan, Yuguang (1); Chen, Bing (1); Li, Jingming (1); Gao, Lin (1); Zhang, Shuo (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an, China
Corresponding author: Yuan, Shuxia(flowingcloud269@163.com)
Source title: Asia-Pacific Journal of Chemical Engineering
Abbreviated source title: Asia-Pac. J. Chem. Eng.
Volume: 15
Issue: 3
Issue date: May 1, 2020
Publication year: 2020
Article number: e2447
Language: English
ISSN: 19322135
E-ISSN: 19322143
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: The paper aims to investigate re-entrainment mechanisms of wall films. The computational fluid dynamics method was adopted to study the gas–liquid separation process considering the wall film model. The interaction between the droplets and gas was solved by Euler–Lagrange method, whereas the forming and stripping of the wall film was studied by Eulerian wall film model. The results reveal that superficial velocity affects the re-entrainment significantly, and there is a critical superficial velocity determining the occurrence of wall film stripping. According to this work, the critical velocity for air continuous phase is 11.2 m/s. It is found that the discrete phase content and droplet size have no effect on film thickness but affect the separation efficiency. The molecular viscosity and the density of continuous phase affect the Eulerian wall film on two aspects. First, the critical stripping velocity decreases with the increase in molecular viscosity. Second, the film average thickness and separation efficiency decrease with the increase in the product of viscosity and density of the continuous phase. Because the high velocity causes some unsteady of the results, the bulk velocities lower than 20 m/s are recommended. The development of re-entrainment mechanism provides a good understanding of inertia separation. © 2020 Curtin University and John Wiley & Sons, Ltd.
Number of references: 41
Main heading: Film thickness
Controlled terms: Efficiency - Computational fluid dynamics - Drops - Viscosity - Separation - Velocity - Air
Uncontrolled terms: Computational fluid dynamics methods - Continuous phase - Critical velocities - Lagrange methods - Liquid separation - Molecular viscosity - Separation efficiency - Superficial velocity

Classification code: 631.1 Fluid Flow, General - 723.5 Computer Applications - 802.3 Chemical Operations - 804 Chemical Products Generally - 913.1 Production Engineering - 931.1 Mechanics - 931.2 Physical Properties of Gases, Liquids and Solids
Numerical data indexing: Velocity 1.12e+01m/s, Velocity 2.00e+01m/s
DOI: 10.1002/apj.2447
Funding Details: Number: 2016JM5046, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

433. Traffic sign recognition based on improved SSD model

Accession number: 20205109638814
Authors: Huo, Aiqing (1); Zhang, Wenle (1); Li, Yi (1)
Author affiliation: (1) School of Electrical Engineering, Xi'An Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Issue date: September 2020
Publication year: 2020
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Article number: 9239763
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In view of the problems of missed detection and low detection accuracy of the SSD model in the detection of small targets, an improved SSD model for traffic road sign recognition was proposed. The model uses DenseNet to replace SSD's basic network VGG16 to reduce the amount of network parameters; learn from the feature fusion method of FCN to improve the detection ability of small targets; increase the convolution of holes to expand the perception domain and reduce the loss of small target information; use depth Separable convolution replaces the Maxpooling layer in DenseNet to avoid information loss during feature extraction. Experiments were carried out on the CTSD data set. The experimental results show that the improved SSD model improves the recognition accuracy and recall rate. © 2020 IEEE.
Number of references: 11
Main heading: Convolution
Controlled terms: Feature extraction - Traffic signs
Uncontrolled terms: Detection ability - Detection accuracy - Feature fusion method - Missed detections - Network parameters - Recognition accuracy - Road sign recognition - Traffic sign recognition
Classification code: 432.4 Highway Traffic Control - 716.1 Information Theory and Signal Processing
DOI: 10.1109/ICCNEA50255.2020.00021
Funding Details: Number: 2020GY-152, Acronym: -, Sponsor: -; Number: 17JS108, Acronym: -, Sponsor: -;
Funding text: This research was partially supported by General Project of Shaanxi Provincial Science and Technology Department- Industrial Field (No. 2020GY-152). This research was partially supported by the scientific research project of the Key Laboratory of Education Department of Shaanxi Province (17JS108).ACKNOWLEDGMENT This research was partially supported by General Project of Shaanxi Provincial Science and Technology Department-Industrial Field (No. 2020GY-152). This research was partially supported by the scientific research project of the Key Laboratory of Education Department of Shaanxi Province (17JS108).
Compendex references: YES

Database: Compendex
Data Provider: Engineering Village

434. A jumping regularization approach based on reconstruction of stabilizing functional for constrained inverse problem

Accession number: 20200808189734
Authors: Rao, Liting (1); Gao, Jianshen (1); Dang, Bo (1); Guo, Rui (2)
Author affiliation: (1) Xi'an Shiyou University, Xi'an, China; (2) Tsinghua University, Beijing, China
Corresponding author: Rao, Liting
Source title: SEG International Exposition and Annual Meeting 2019
Abbreviated source title: SEG Int. Expo. Annu. Meet.
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Issue title: SEG International Exposition and Annual Meeting 2019
Issue date: 2020
Publication year: 2020
Report number: SEG-2019-3215349
Pages: 1075-1079
Language: English
Document type: Conference article (CA)
Conference name: Society of Exploration Geophysicists International Exposition and Annual Meeting 2019, SEG 2019
Conference date: September 15, 2019 - September 20, 2019
Conference location: San Antonio, TX, United states
Conference code: 157166
Publisher: Society of Exploration Geophysicists
Abstract: In the framework of regularization theory, a priori geologic information is included in the inversion process and formalized by means of the stabilizer. Based on available geologic information, which specific stabilizer to choose is still lack of evidence among the alternatives. In order to provide a selection strategy of the stabilizer in the unified framework, we develop a new technique to solve the inverse problems constrained by different stabilizers, called jumping regularization approach based on reconstruction of stabilizing functional. First, we reconstruct stabilizers as the weighted least-squares norm of a kernel function. Reconstruction idea in our technique provides a better understanding of how stabilizers differ from each other and what the core of minimization of stabilizing functional is. Then, in the simple and unified framework of jumping approach, which iteratively solves for model itself during the inversion, the solution to each inverse problem with the specific stabilizer can be readily achieved by replacing the form of kernel function and weight function. Each constrained inverse problem solved with our technique has been successfully tested on the synthetic data of layered magnetotelluric models. Our research provides a more reasonable basis for selecting different stabilizers in inversion, meanwhile providing a solving method for more flexible tests. © 2019 SEG
Number of references: 11
Main heading: Inverse problems
Controlled terms: Iterative methods
Uncontrolled terms: Geologic information - Inversion process - Regularization approach - Regularization theory - Stabilizing functionals - Unified framework - Weight functions - Weighted least squares
Classification code: 921.6 Numerical Methods
DOI: 10.1190/segam2019-3215349.1
Funding Details: Number: 41804115, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: -, Acronym: CAS, Sponsor: Chinese Academy of Sciences; Number: 2018JQ4007, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: The authors would like to thank Dr. Xin Wu from Chinese Academy of Sciences for many fruitful discussions and the guidance on manuscript editing. We also acknowledge the support by the National Natural Science Foundation of China (No. 41804115) and the Natural Science Basic Research Plan in Shaanxi Province of China (No. 2018JQ4007).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

435. Experimental study on deep hole drilling of GH4169 alloy (*Open Access*)

Accession number: 20205209693337

Authors: Liu, Zhan Feng (1); Li, Zhan Hui (1); Han, Xiao Lan (1); Wang, Yu (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'An, China
Corresponding author: Li, Zhan Hui(1808612891@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1635
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Issue: 1
Issue title: 2020 6th International Forum on Engineering Materials and Manufacturing Technology, IFEMMT 2020
Issue date: December 4, 2020
Publication year: 2020
Article number: 012075
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 6th International Forum on Engineering Materials and Manufacturing Technology, IFEMMT 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Jilin, China
Conference code: 165553
Publisher: IOP Publishing Ltd
Abstract: GH4169 alloy material has good corrosion resistance, radiation resistance and other excellent properties, and has been widely used in aerospace and other manufacturing fields. At the same time, due to its severe machining hardening phenomenon and high cutting force during machining, it is also one of the typical difficult-to-machine materials, and the deep hole drilling of GH4169 alloy has been rarely studied. In this paper, the deep hole drilling test of GH4169 is studied, and BTA system is adopted in the test, the wear and failure modes of the cutting tool, and the change of chip morphology were analyzed. Results showed that the middle cutter tooth wear focused on central blade, the wear of the center tooth occurs mainly at the tip of the cutter tooth, the wear of edge tooth mainly occurs at the arc of the tool tip where the main cutting edge is connected with the secondary cutting edge: the chips produced by the central cutter tooth are mostly short and small c-shaped chips, the chip produced by the middle tooth is not easy to break the chip, most of which are elongated spiral chip, the cuttings produced by the edge tooth are not easy to discharge, and most of them are hard spiral coils. © Published under licence by IOP Publishing Ltd.
Number of references: 9
Main heading: Corrosion resistance
Controlled terms: Cutting tools - Infill drilling - Corrosion resistant alloys
Uncontrolled terms: Chip morphologies - Cutting edges - Cutting forces - Deep hole drilling - Difficult to machine materials - GH4169 alloys - Manufacturing fields - Radiation resistance
Classification code: 511.1 Oil Field Production Operations - 531 Metallurgy and Metallography - 539.1 Metals Corrosion - 603.2 Machine Tool Accessories
DOI: 10.1088/1742-6596/1635/1/012075
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

436. Design of current buck converter based on frequency domain analysis

Accession number: 20205109638678
Authors: Guo, Yingna (1); Song, Jiuxu (1); Gao, Pengfei (1); Ren, Jiamin (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
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Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Issue date: September 2020
Publication year: 2020
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Article number: 9239797
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: DC/DC converters working in current mode are widely used. However, the complexity of the loop design for these converters is high (double-loop control system). The small signal model of the Buck converter in average current mode is established, and the transfer function for duty cycle to output is deduced. Based on the analysis of the stability for the converter, appropriate current loop compensation and voltage loop compensation are designed. The correctness of the designed control loop is verified with simulations from MATLAB and PSIM in frequency domain and time domain. The proposed method in frequency domain has certain reference value for control loop design in switching power supplies. © 2020 IEEE.
Number of references: 11
Main heading: Frequency domain analysis
Controlled terms: MATLAB - Buck converter - Electric power supplies to apparatus - Time domain analysis
Uncontrolled terms: Average currents - Buck converters - Control loop design - Double-loop control - Frequency domains - Reference values - Small signal model - Switching power supplies
Classification code: 704.1 Electric Components - 723.5 Computer Applications - 921 Mathematics - 921.3 Mathematical Transformations
DOI: 10.1109/ICCNEA50255.2020.00076
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: ACKNOWLEDGMENT This research project is supported by the dynamic compensation and unit power factor correction project of the rotary steering drilling tool torque motor (15JS083) and the graduate student innovation and practical ability training project of Xi'an Shiyou University strongly supported this article.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

437. Virtual visualization system for well trajectory of immersion directional well

Accession number: 20205109638825
Authors: Sha, Linxiu (1, 2); Li, Kun (1, 2)
Author affiliation: (1) Shaanxi Key Laboratory of Measurement and Control Technology for Oil and Gas Wells, Xi'An Shiyou University, Xi'an, China; (2) School of Electronic Engineering, Xi'An Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
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Article number: 9239775
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: Aiming at the increasingly complex downhole oil and gas drilling operations, in order to meet the visual control decision-making requirements of the formation borehole trajectory, the formation and bit model are designed through 3Dmax, and the C# (C sharp) script program is designed under the unity3d engine to drive the bit to run in a virtual environment. A set of virtual visualization system for directional wellbore trajectory developed. This system takes a directional well in northern Shaanxi as an example. In the visual stratum, the optimized and LWD directional well traces are dynamically displayed based on the optimized data and the LWD data, providing a friendly and interactive environment for LWD control. Decision-making environment. The results prove that the visualization of formation environment, virtual bit dynamic control and immersive well trace dynamic virtual display realized by this system not only provide a research platform for precise control and decision of wellbore trajectory, but also reduce research cost and improve research efficiency. © 2020 IEEE.
Number of references: 10
Main heading: Decision making
Controlled terms: Oil wells - Trajectories - Visualization - Digital storage - Virtual reality - Three dimensional computer graphics - 3D modeling - Boreholes - Oil field equipment
Uncontrolled terms: Borehole trajectories - Directional well - Interactive Environments - Research efficiency - Research platforms - Virtual displays - Visualization system - Wellbore trajectory
Classification code: 511.2 Oil Field Equipment - 512.1.1 Oil Fields - 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 - 912.2 Management
DOI: 10.1109/ICCNEA50255.2020.00089
Funding Details: Number: 18JS095,290088112,331890049, Acronym: -, Sponsor: -; Number: 2020GY-046, Acronym: -, Sponsor: Agriculture Department of Shaanxi Province;
Funding text: ACKNOWLEDGMENT The project is funded by the key R&D project of Shaanxi Province in Shaanxi Province, the development of a virtual simulation platform for remote interactive optimization control of oil and gas rigs (2020GY-046), the research project of the Key Laboratory of Shaanxi Provincial Department of Education: Multi-objective interactive optimization study of complex borehole trajectory while drilling (18JS095), school-level 2019 virtual simulation experiment teaching project: virtual simulation experiment of remote interactive optimization control of virtual oil and gas rigs (331890049), school-level youth innovation project: dynamic control of drilling process based on stochastic reservoir modeling (290088112) and the Graduate Innovation and Practical Ability Training Program of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

438. Application of analytic hierarchy process in performance appraisal system (*Open Access*)

Accession number: 20204809524014
Authors: Shi, Gao-Yang (1); Wang, Xiao-Yan (2)
Author affiliation: (1) School of Science, Xi'An Shiyou University, Xi'an, Shaanxi; 710065, China; (2) School of Science, Xi'An Shiyou University, Xi'an, Shaanxi; 710065, China
Corresponding author: Shi, Gao-Yang(shiyouwxy@126.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1634
Part number: 1 of 1
Issue: 1
Issue title: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Issue date: October 13, 2020
Publication year: 2020
Article number: 012058
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Conference date: July 17, 2020 - July 19, 2020

Conference location: Dali, China
Conference code: 164232
Publisher: IOP Publishing Ltd
Abstract: Based on the KPI and BSC assessment method commonly used in management, combined with the analytic hierarchy process in mathematics, the core algorithm of the assessment system is updated, the weight of each assessment element is scientifically measured, and the requirement of fairness and justice in the assessment function of the system is guaranteed, which provides scientific basis for the final performance appraisal results. Zero client B/S architecture is adopted, and UML modeling is used for system analysis. Modeling methods such as timing diagrams are used in the system design, and combined with JavaWeb technology to complete the construction of system pages and interaction with the server. It realizes the design and development of the performance appraisal system, and makes human resource management more scientific and convenient. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Analytic hierarchy process
Controlled terms: Functions - Systems analysis - Human resource management
Uncontrolled terms: Assessment system - B/S architecture - Core algorithms - Design and Development - Performance appraisal - Performance appraisal system - Scientific basis - Timing diagrams
Classification code: 912.2 Management - 912.3 Operations Research - 912.4 Personnel - 921 Mathematics - 961 Systems Science
DOI: 10.1088/1742-6596/1634/1/012058
Funding Details: Number: 201910705054X, Acronym: -, Sponsor: -;
Funding text: We are grateful for the financial support provided by the National University Student Innovation and Entrepreneurship Project (201910705054X).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

439. Experimental study of TC4 titanium alloy deep hole drilling based on machine-clamped deep hole drill

Accession number: 20202908946764
Authors: Yan-Shu, L.I.U. (1); Yu, Wang (1)
Author affiliation: (1) Xi'An Shiyou University, School of Mechanical Engineering, Xi'an; 710000, China
Corresponding author: Yan-Shu, L.I.U.(376874313@qq.com)
Source title: Proceedings - 2020 3rd International Conference on Electron Device and Mechanical Engineering, ICEDME 2020
Abbreviated source title: Proc. - Int. Conf. Electron Device Mech. Eng., ICEDME
Part number: 1 of 1
Issue title: Proceedings - 2020 3rd International Conference on Electron Device and Mechanical Engineering, ICEDME 2020
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Pages: 162-167
Article number: 9122114
Language: English
ISBN-13: 9781728181455
Document type: Conference article (CA)
Conference name: 3rd International Conference on Electron Device and Mechanical Engineering, ICEDME 2020
Conference date: May 1, 2020 - May 3, 2020
Conference location: Suzhou, China
Conference code: 161422
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: There are many deep hole processing methods for TC4 titanium alloy, but it is a blank to drill with a mahine-clamped deep hole drill, so we have carried out some experi - mental studies. Using different spindle speed and feed in the test process of chip morphology and chip removal condition respectively and drill bit, the abrasion of guide block is analyzed using single factor method is suitable for the machine clamp type TC4 titanium alloy drilling deep hole drill in the best condition, get the best speed, the best feeding, for deep hole drill machine clamp type provides effective of TC4 titanium alloy drilling processing parameters. © 2020 IEEE.
Number of references: 10

Main heading: Drills
Controlled terms: Infill drilling - Testing - Titanium alloys - Processing
Uncontrolled terms: Chip morphologies - Deep hole drilling - Deep hole processing - Factor methods - Processing parameters - Spindle speed - TC4 titanium alloy - Test process
Classification code: 511.1 Oil Field Production Operations - 542.3 Titanium and Alloys - 603.2 Machine Tool Accessories - 913.4 Manufacturing
DOI: 10.1109/ICEDME50972.2020.00043
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

440. Laboratory study of nitrogen/foam enhanced oil recovery from vuggy-fractured carbonate reservoirs (*Open Access*)

Accession number: 20204809531289
Authors: Wang, Yang (1); Fan, Hongwei (1); Gong, Quanfeng (1); Xin, Dong (1)
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Corresponding author: Wang, Yang(wyang2235@126.com)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 585
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Issue: 1
Issue title: 2020 6th International Conference on Energy, Environment and Materials Science
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Publication year: 2020
Article number: 012037
Language: English
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Document type: Conference article (CA)
Conference name: 2020 6th International Conference on Energy, Environment and Materials Science, EEMS 2020
Conference date: August 28, 2020 - August 30, 2020
Conference location: Hulun Buir, China
Conference code: 164813
Publisher: IOP Publishing Ltd
Abstract: Aiming at a special vuggy-fractured carbonate, the mechanism of nitrogen flooding, co-injection of water and nitrogen (CWN), water alternating gas injection (WAG) and foam flooding was studied by slate model. Experimental results showed that mechanism of nitrogen flooding was displacing attic oil, which was similar to other vuggy fractured reservoirs. While to CWN, the main mechanism was not relieve of gas channeling. It was found that gas mainly flowed through the upper hole or the upper location of hole and water mainly flowed along the lower hole or the lower location of hole. The main reason why CWN recovery was higher than nitrogen flooding was that during nitrogen flooding, nitrogen would substitute attic oil, so some oil would flow to the water channel and form remaining oil in water channel. During CWN, water flowed mainly along the water channel in previous water flooding, so remaining oil in water channel would not occur during CWN. While to WAG, it had lowest recovery. Among the previous three flooding methods, remaining oil named "sandwich oil"was found between gas and water. © Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Nitrogen
Controlled terms: Petroleum reservoir engineering - Floods - Fracture - Reservoirs (water) - Petroleum reservoirs - Enhanced recovery - Oil well flooding
Uncontrolled terms: Enhanced oil recovery - Fractured carbonate reservoirs - Fractured carbonates - Fractured reservoir - Gas channeling - Laboratory studies - Water channels - Water-alternating-gas injection
Classification code: 441.2 Reservoirs - 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 804 Chemical Products Generally - 951 Materials Science
DOI: 10.1088/1755-1315/585/1/012037
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex

Data Provider: Engineering Village

441. Phaseless signal recovery from triple-window short-time Fourier measurements (*Open Access*)

Accession number: 20203809182374
Authors: Lin, Wei (1); Zhang, Ruiqiong (1); Xu, Xinlan (1); Min, Hao (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Lin, Wei(davidlinw@126.com)
Source title: Journal of Physics: Conference Series
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Issue date: August 25, 2020
Publication year: 2020
Article number: 012081
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 2nd International Conference on Electronic Engineering and Informatics, EEI 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Lanzhou, China
Conference code: 162560
Publisher: Institute of Physics Publishing
Abstract: In this paper, we present a signal recovering algorithm from the magnitudes of its short-time Fourier transform when triple window functions are utilized. Some sufficient conditions are proved on the window functions under which the magnitude of the signal vector can be recovered and the phases of the rest of coordinates can be propagated. Finally, we propose an example to show that the signal vector, up to a unimodular, can be recovered from the magnitudes of its triple-window short-time Fourier transforms. © Published under licence by IOP Publishing Ltd.
Number of references: 20
Main heading: Recovery
Controlled terms: Fourier transforms - Signal reconstruction
Uncontrolled terms: Fourier - Short time Fourier transforms - Signal recovery - Signal vectors - Unimodular - Window functions
Classification code: 716.1 Information Theory and Signal Processing - 921.3 Mathematical Transformations
DOI: 10.1088/1742-6596/1617/1/012081
Funding Details: Number: 201910705019, Acronym: -, Sponsor: -;
Funding text: This work was financially supported by National Training Programs of Innovation and Entrepreneurship for Undergraduate(No.201910705019).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

442. Unsteady Pressure Dynamics of Polymer Flooding Reservoirs Considering Concentration Changes

Accession number: 20203409085580
Authors: Xie, Qing (1); Xu, Jianping (1); Chen, Minjing (2)
Author affiliation: (1) Petroleum Engineering Institute, Xian Shiyou University, Xian; Shanxi, China; (2) Qingdao Jari Industry Control Technology Ltd., Qingdao; 266100, China
Corresponding author: Xu, Jianping(1007662012@qq.com)
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Abbreviated source title: Chem. Technol. Fuels Oils
Volume: 56

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Issue date: July 1, 2020
Publication year: 2020
Pages: 481-491
Language: English
ISSN: 00093092
E-ISSN: 15738310
Document type: Journal article (JA)
Publisher: Springer
Abstract: In this paper a model is established for unstable seepage flow with polymer concentration and pressure diffusion coupling, considering the effects of polymer molecular diffusion, adsorption, and viscoelasticity of polymer solution in the formation. The factors are close to the actual seepage parameters of the injected reservoir. For the nonlinear adsorption, the combined variable and the analytical iterative method are used to obtain the approximate analytical solution of the model. According to the concentration model, the relationship between concentration and pressure distribution is obtained. Using the model theory curve to fit the well test data, the seepage parameters of the formation are obtained, and the reflection characteristics of the unstable wellbore pressure derivative curve are analyzed. © 2020, Springer Science+Business Media, LLC, part of Springer Nature.
Number of references: 13
Main heading: Viscoelasticity
Controlled terms: Reservoirs (water) - Adsorption - Diffusion in liquids - Well testing - Seepage - Iterative methods
Uncontrolled terms: Approximate analytical solutions - Concentration change - Concentration model - Molecular diffusion - Nonlinear adsorption - Polymer concentrations - Pressure diffusion - Reflection characteristics
Classification code: 441.2 Reservoirs - 802.3 Chemical Operations - 921.6 Numerical Methods - 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.1007/s10553-020-01159-x
Funding Details: Number: 51974247,41502311,51874241, Acronym: -, Sponsor: -; Number: 15JS088, Acronym: -, Sponsor: -; Number: 2019JQ-807,2018JM5054, Acronym: -, Sponsor: -;
Funding text: This work is supported by National Natural Science Foundation (No. 51974247, No. 41502311, No. 51874241), Key Laboratory Research Project of Education Department of Shaanxi Province (No. 15JS088), and Shaanxi Basic Research Projects in Natural Sciences (No. 2018JM5054, No. 2019JQ-807).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

443. Design of Multi-Functional Lighting System Based on Solar Power (*Open Access*)

Accession number: 20203209027601
Authors: Zhihong, Xiao (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Zhihong, Xiao(xzhong@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: 2
Issue title: 2020 4th International Workshop on Renewable Energy and Development, IWRED 2020 - 1. Energy Engineering and Power Engineering
Issue date: July 13, 2020
Publication year: 2020
Article number: 022053
Language: English
ISSN: 17551307
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Document type: Conference article (CA)
Conference name: 2020 4th International Workshop on Renewable Energy and Development, IWRED 2020
Conference date: April 24, 2020 - April 26, 2020
Conference location: Sanya, China
Conference code: 161772
Publisher: Institute of Physics Publishing

Abstract: This paper introduces the multi-functional lighting system which is a national undergraduate innovation training program. In view of the increasing energy shortage and environmental pollution, a multi-functional lighting system powered by solar energy is designed by project team members. In addition to the lighting function, the system also has killing insect and counting functions on some special occasions. This system uses STC90C516 as the control center, uses infrared diffuse reflection photoelectric switch and infrared human body sensor as the counting sensor, multi-color LED array as the lighting device, using the phototaxis of pests to attract pests and kill them with high-voltage power grid. The results show that the system is energy-saving, environmental friendly, accurate in counting, and has good insecticidal effect on many kinds of pests. © Published under licence by IOP Publishing Ltd.
Number of references: 8
Main heading: Solar energy
Controlled terms: Lighting fixtures - Energy conservation - Electric power system control - Electric power transmission networks - Lighting - Personnel training
Uncontrolled terms: Counting functions - Diffuse reflection - Environmental pollutions - Environmental-friendly - High voltage power - Multi-functional - Photoelectric switches - Training program
Classification code: 525.2 Energy Conservation - 657.1 Solar Energy and Phenomena - 706.1 Electric Power Systems - 706.1.1 Electric Power Transmission - 731.2 Control System Applications - 912.4 Personnel
DOI: 10.1088/1755-1315/510/2/022053
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

444. Exergy analysis of supersonic steam jet condensed into subcooled water

Accession number: 20194807751824
Authors: Li, Wenjun (1); Miao, Lili (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Li, Wenjun(190205@xsyu.edu.cn)
Source title: Annals of Nuclear Energy
Abbreviated source title: Ann Nucl Energy
Volume: 138
Issue date: April 2020
Publication year: 2020
Article number: 107224
Language: English
ISSN: 03064549
E-ISSN: 18732100
CODEN: ANENDJ
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: Exergy analysis of supersonic steam jet condensed into subcooled water was conducted via a numerical method. A thermal phase-change model was employed by Ansys, and considering turbulence interaction and turbulent dispersion force, three-dimensional simulations were conducted to simulate supersonic steam jet at different test conditions. Results indicated that the exergy flow of steam jet was mainly affected by water temperature and inlet steam pressure. The total physical exergy flow decayed monotonically due to the significant irreversible losses caused by heat and momentum transfer. For under-expanded supersonic steam jet, the peak distributions of steam kinetic exergy flow were obtained. The peak distributions of the water enthalpy exergy flow were also obtained at low water temperatures (293.15 K and 303.15 K). In addition, water temperature was found to be the main factor in the damping-energy properties of the supersonic steam jet. The damping-energy ratio and decay rate of the time-averaged kinetic energy decreased with the increase in water temperature, and a correlation was proposed to predict the time-averaged kinetic energy decay ratio. © 2019 Elsevier Ltd
Number of references: 37
Main heading: Water temperature
Controlled terms: Two phase flow - Image enhancement - Steam - Exergy - Numerical methods - Kinetic energy - Kinetics - Damping - Supersonic aerodynamics
Uncontrolled terms: Exergy Analysis - Kinetic-energy decay - Steam jet - Thermal phase change models - Three dimensional simulations - Turbulence interactions - Turbulent dispersion forces - Water temperatures
Classification code: 631.1 Fluid Flow, General - 641.1 Thermodynamics - 651.1 Aerodynamics, General - 921.6 Numerical Methods - 931 Classical Physics; Quantum Theory; Relativity - 931.1 Mechanics
Numerical data indexing: Temperature 2.93e+02K, Temperature 3.03e+02K

DOI: 10.1016/j.anucene.2019.107224
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

445. Development of a Miniature Recorder for Drilling Motors (*Open Access*)

Accession number: 20205209693260
Authors: Li, Fei (1); Song, Haolan (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an, Shaanxi, China
Corresponding author: Li, Fei(lif@xsyu.edu.cn)
Source title: Journal of Physics: Conference Series
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Issue title: 2020 6th International Forum on Engineering Materials and Manufacturing Technology, IFEMMT 2020
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Publication year: 2020
Article number: 012112
Language: English
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Conference name: 2020 6th International Forum on Engineering Materials and Manufacturing Technology, IFEMMT 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Jilin, China
Conference code: 165553
Publisher: IOP Publishing Ltd
Abstract: A recorder is designed to record the vibration data of the drilling motor for health assessment of the motor to improve the drilling efficiency. It is installed in the rotor catch of the drilling motor without increasing the length of the bottom hole assembly(BHA). The recorder is equipped with two triaxial vibration accelerometers with different ranges, a rate gyroscope, a temperature sensor, and an integrated circuit (IC) for timestamps. The recorder can measure and record the vibration data of the entire operation cycle of the ground transportation, rig-side handling and downhole operations of the motor. Vibration recorder does not require any configuration or intervention at rig sides so that it can be easily deployed to motor operations. The Python-based data analysis software was developed for the miniature vibration recorder. The analyzer can make statistics on the recorded data and display it with time plots and histogram. The vibration recorders provided adequate information of a drilling motor to maintenance shops and operator. These statistical data and charts can help users understand transportation, rig-side handling and downhole drilling. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Gyroscopes
Controlled terms: Integrated circuits - Vibration analysis - Computer software - Infill drilling
Uncontrolled terms: Data analysis softwares - Down-hole drilling - Downhole operation - Drilling efficiency - Health assessments - Maintenance shops - Statistical datas - Triaxial vibrations
Classification code: 511.1 Oil Field Production Operations - 714.2 Semiconductor Devices and Integrated Circuits - 723 Computer Software, Data Handling and Applications
DOI: 10.1088/1742-6596/1635/1/012112
Funding Details: Number: 20JS125, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: The project is supported 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

446. Block chain digital invoice system risk assessment and system development research

Accession number: 20202608864828

Authors: Li, Gaohe (1); Sun, Sicheng (1); Li, Xinhao (1)
Author affiliation: (1) School of Economic Management, Xi'An Shiyou University, Xi'an; 710065, China
Source title: Proceedings - 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Abbreviated source title: Proc. - Int. Conf. Intell. Transp., Big Data Smart City, ICITBS
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
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Article number: 9109899
Language: English
ISBN-13: 9781728166971
Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Conference date: January 11, 2020 - January 12, 2020
Conference location: Vientiane, Laos
Conference code: 160946
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: In view of the tax problems existing in the current electronic invoices, such as 'overstatement, false declaration, false invoice', etc., a new method for checking the authenticity of electronic invoices is proposed by using the block chain technology. The risk of the existing electronic invoice system is evaluated by using artificial intelligence automatic identification technology and graphic image processing technology. The results show that the method adopted is efficient, safe and fair, avoids waste of calculation effort, and is suitable for block chain transactions with large-scale invoice tracing and reimbursement records. © 2020 IEEE.
Number of references: 4
Main heading: Risk assessment
Controlled terms: Blockchain - Image processing - Automation
Uncontrolled terms: Graphic images - Identification technology - Invoice systems - System development - Tax problems
Classification code: 723.2 Data Processing and Image Processing - 723.3 Database Systems - 731 Automatic Control Principles and Applications - 914.1 Accidents and Accident Prevention
DOI: 10.1109/ICITBS49701.2020.00160
Funding Details: Number: -, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: National natural science foundation of China project: study on detection method of fixed structure artificial targets in high-resolution optical remote sensing images based on multi-core learning (No.Z13130)
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

447. Research on an Active Wireless Local Area Network Access Management Model

Accession number: 20211210116055
Authors: Liu, Tianshi (1); Shi, Dong (1); Yang, Guang (1)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Shi, Dong(swhzyq@163.com)
Source title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Abbreviated source title: Proc. - Int. Conf. Inf. Sci., Comput. Technol. Transp., ISCTT
Part number: 1 of 1
Issue title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Issue date: November 2020
Publication year: 2020
Pages: 168-171
Article number: 9363842
Language: English
ISBN-13: 9781728185750
Document type: Conference article (CA)

Conference name: 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Conference date: November 13, 2020 - November 15, 2020
Conference location: Shenyang, China
Conference code: 167693
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: When the number of users of a wireless access point exceeds the limit that its own hardware can carry, it will cause new users to be unable to access, and even lead to the collapse of the entire wireless network. In response to this problem, this paper designs an active wireless network access management model. The model manages the clients in the wireless local area network through the Radius protocol, so as to realize the batch access to a large number of users. After the client completes the data transmission, the wireless access point actively disconnects its connection to release channel resources, and thereby effectively improving the carrying capacity of the wireless network. The test results show that this model can significantly reduce the load of wireless access points, and enable wireless access points with weaker performance to support the data transmission needs of a large number of users. © 2020 IEEE.
Number of references: 9
Main heading: Data transfer
Controlled terms: Information management - Wireless local area networks (WLAN) - Data communication systems - Internet protocols
Uncontrolled terms: Channel resource - Wireless access points - Wireless network access
Classification code: 722.3 Data Communication, Equipment and Techniques - 723 Computer Software, Data Handling and Applications
DOI: 10.1109/ISCTT51595.2020.00037
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

448. Selection Optimization Modeling of Logistics Site and Applications

Accession number: 20211210116152
Authors: Liu, Tianshi (1); Yang, Xiaobo (1); Yin, Yike (1)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Liu, Tianshi(1029292635@qq.com)
Source title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Abbreviated source title: Proc. - Int. Conf. Inf. Sci., Comput. Technol. Transp., ISCTT
Part number: 1 of 1
Issue title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Issue date: November 2020
Publication year: 2020
Pages: 571-574
Article number: 9363820
Language: English
ISBN-13: 9781728185750
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Conference name: 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Conference date: November 13, 2020 - November 15, 2020
Conference location: Shenyang, China
Conference code: 167693
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: This paper analyzed the characteristics of logistics distribution site location problem, combined with the impact factors and constraints of logistics distribution link, and constructed the mathematical model of logistics site optimization location. For this model, an improved k-means clustering optimization algorithm is proposed. The algorithm can improves the coordinate division conditions of K-means clustering algorithm, and integrates the global search ability of simulated annealing algorithm, which effectively improves the clustering effect. The experimental results show that the proposed model can accurately express the relationship between logistics cost and site location. Combined with the proposed improved k-means clustering algorithm, the optimal location distribution of economic cost can be obtained. © 2020 IEEE.

Number of references: 8
Main heading: Simulated annealing
Controlled terms: K-means clustering - Location - Site selection - Costs
Uncontrolled terms: Clustering effect - Global search ability - Improved k-means clustering - Logistics costs - Logistics distribution - Optimal locations - Optimization modeling - Simulated annealing algorithms
Classification code: 537.1 Heat Treatment Processes - 903.1 Information Sources and Analysis - 911 Cost and Value Engineering; Industrial Economics
DOI: 10.1109/ISCTT51595.2020.00109
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

449. Construction of Driving Behavior Scoring Model based on OBD Terminal Data Analysis

Accession number: 20211210116165
Authors: Liu, Tianshi (1); Yang, Guang (1); Shi, Dong (1)
Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an; 710065, China
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Source title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Abbreviated source title: Proc. - Int. Conf. Inf. Sci., Comput. Technol. Transp., ISCTT
Part number: 1 of 1
Issue title: Proceedings - 2020 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Issue date: November 2020
Publication year: 2020
Pages: 24-27
Article number: 9363730
Language: English
ISBN-13: 9781728185750
Document type: Conference article (CA)
Conference name: 5th International Conference on Information Science, Computer Technology and Transportation, ISCTT 2020
Conference date: November 13, 2020 - November 15, 2020
Conference location: Shenyang, China
Conference code: 167693
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to accurately identify abnormal driving behaviors, this paper proposes different abnormal driving behavior recognition algorithms. The algorithm obtains driver's driving data through the OBD terminal, combines the x-axis and y-axis acceleration changes and behavior duration of the vehicle's three-axis acceleration sensor to identify abnormal driving behaviors, establishes a hierarchical driving behavior indicator system and judgment matrix. On this basis, a driving behavior scoring model is established. The model combines the driving data of the driver, takes the proportion of abnormal driving behavior as the evaluation index, and uses the entropy weight method and the analytic hierarchy process to obtain the index weight. The test results of an example show that the model can analyze and evaluate the driving behavior of the driver well, and give a score of driver's behavior, to encourage the driver to develop good driving habits and effectively prevent the occurrence of traffic accidents. © 2020 IEEE.
Number of references: 7
Main heading: Analytic hierarchy process
Controlled terms: Intelligent systems - Intelligent vehicle highway systems - Behavioral research
Uncontrolled terms: Acceleration change - Driver's behavior - Driving behavior - Entropy weight method - Evaluation index - Indicator system - Judgment matrix - Three-axis acceleration sensor
Classification code: 406.1 Highway Systems - 461.4 Ergonomics and Human Factors Engineering - 723.4 Artificial Intelligence - 723.5 Computer Applications - 961 Systems Science - 971 Social Sciences
DOI: 10.1109/ISCTT51595.2020.00012
Funding Details: Number: 2019JQ-056, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 61802301, Acronym: -, Sponsor: -;
Funding text: This work was supported by National Natural Science Youth Fund Project (61802301) and the Natural Science Basic Research Plan in Shaanxi Province of China (2019JQ-056).
Compendex references: YES
Database: Compendex

450. Numerical investigation on thermal hydraulic performance of supercritical LNG in sinusoidal wavy channel based printed circuit vaporizer

Accession number: 20201908614101
Authors: Bai, Junhua (1); Pan, Jie (1); He, Xiaoru (1); Wang, Kai (1); Tang, Linghong (2); Yang, Ruijie (3)
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Corresponding author: Bai, Junhua(jhbai@xsyu.edu.cn)
Source title: Applied Thermal Engineering
Abbreviated source title: Appl Therm Eng
Volume: 175
Issue date: 5 July 2020
Publication year: 2020
Article number: 115379
Language: English
ISSN: 13594311
CODEN: ATENFT
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: As a new type of micro-channel heat exchange, printed circuit heat exchanger (PCHE) is a better choice as main cryogenic heat exchanger (MCHE) on LNG carriers and LNG floating terminals for high efficiency and compactness. In this work, a 3D-numerical model of PCHE employing SST k-$_{\omega}$ turbulent model is built after validating against the classic experimental data of supercritical fluid. The cross section of S-LNG channel is a semi-circle with radius of 0.9 mm, size of solid region (stainless steel) is 2.15 mm × 1.6 mm, the overall length of the channel is 500 mm and the centerline formula of the channel is z = 0.5sin(0.5x). Based on this model, the thermal hydraulic performance of supercritical LNG (S-LNG) in sinusoidal wavy channel of printed circuit vaporizer (PCV) is investigated, and the effects of heat flux and operation pressure on flow and heat transfer are analyzed, which aim to improve the understanding of flow and heat transfer mechanism of S-LNG in sinusoidal wavy semi-circuit channel. Moreover, the simulation result indicates that the maximum gap of heat transfer coefficient between adjacent observation cross section can reach 1.28 kW·m-2·K-1, and the effect of buoyancy force is not domination on heat transfer; the reverse flow occurs nearly in every periodic segment, and the flowing "dead zone" and vortex appear close to the inner wall of cross section, especially near the region of included angle between the straight edge and the semi-circle curve; the lower intensity of both turbulent structure rebuilding and secondary flow appears under higher operating pressure, and after passing large specific heat region, the effect of operating pressure is inappreciable. © 2020 Elsevier Ltd
Number of references: 36
Main heading: Timing circuits
Controlled terms: 3D modeling - Structure (composition) - Electric network analysis - Specific heat - Heat transfer performance - Supercritical fluids - Effluent treatment - Heat flux - Heat exchangers - Printed circuits
Uncontrolled terms: 3-D numerical modeling - Floating terminals - Flow and heat transfer - Main cryogenic heat exchangers - Numerical investigations - Printed circuit heat exchangers - Thermal-hydraulic performance - Turbulent structures
Classification code: 452.4 Industrial Wastes Treatment and Disposal - 616.1 Heat Exchange Equipment and Components - 641.1 Thermodynamics - 641.2 Heat Transfer - 703.1.1 Electric Network Analysis - 713.4 Pulse Circuits - 723.2 Data Processing and Image Processing - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Size 1.60e-03m, Size 5.00e-01m, Size 9.00e-04m
DOI: 10.1016/j.applthermaleng.2020.115379
Funding Details: Number: 51774237, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-285, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 16JK1594, Acronym: -, Sponsor: Scientific Research Plan Projects of Shaanxi Education Department;
Funding text: This study was supported by the Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-285), the National Natural Science Foundation of China (Grant No. 51774237), and the Scientific Research Plan Projects of Shaanxi Education Department (Program No. 16JK1594).This study was supported by the Natural Science Basic Research Plan in Shaanxi Province of China (Program No. 2019JQ-285), the National Natural Science Foundation of China (Grant No. 51774237), and the Scientific Research Plan Projects of Shaanxi Education Department (Program No. 16JK1594).

Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

451. Retraction: Intelligent traffic control system based on open IoT and machine learning (Journal of Intelligent and Fuzzy Systems DOI: 10.3233/JIFS-219322)

Accession number: 20224913212403
Authors: Chen, Jiaona (1); Liu, Hailong (1)
Author affiliation: (1) School of Electronic Engineering, Xi'An Shiyou University, Shaanxi, Xi'an, China
Corresponding author: Liu, Hailong(chenjn@chd.edu.cn)
Source title: Journal of Intelligent and Fuzzy Systems
Abbreviated source title: J. Intelligent Fuzzy Syst.
Volume: 40
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Publication year: 2020
Pages: 7001-7012
Language: English
ISSN: 10641246
E-ISSN: 18758967
Document type: Retracted (TB)
Publisher: IOS Press BV
DOI: 10.3233/JIFS-189531
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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).
ErratuFlg: 2022081159
Database: Compendex
Data Provider: Engineering Village

452. Rock-breaking characteristics and temperature field change of cone-PDC hybrid bits

Accession number: 20201708556746
Title of translation: -PDC
Authors: Wu, Zebing (1); Lyu, Lantao (1); Wang, Yongyong (1); Pan, Yujie (1); Zhang, Shuai (1)
Author affiliation: (1) Mechanical Engineering College, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Source title: Natural Gas Industry
Abbreviated source title: Natur. Gas Ind.
Volume: 40
Issue: 3
Issue date: March 25, 2020
Publication year: 2020
Pages: 99-106
Language: Chinese
ISSN: 10000976
CODEN: TIGOE3
Document type: Journal article (JA)
Publisher: Natural Gas Industry Journal Agency
Abstract: Compared with a conventional PDC bit or a cone bit, a cone-PDC hybrid bit is better in rock breaking effect. The heat generated in the process of its rock breaking has a significant effect on its service life and drilling efficiency. So far, however, the temperature fields and rock breaking characteristics in the process of its rock breaking have not been researched thoroughly. In order to provide a theoretical support for the optimization and popularization of a hybrid bid, this paper established a rock-breaking simulation model based on finite element analysis method, elastic-plastic mechanics, etc. And based on this, temperature field change laws and rock breaking characteristics of the hybrid bit in the process of rock breaking were analyzed. And the following research results were obtained. First, when a cone-dominated hybrid bit is used for rock breaking, the rolling cutter firstly impacts the rock to generate breaking pit and

then PDC cogging carries out shearing. And when the PDC-dominated hybrid bit is used, the PDC cogging creates grooves by conducting scraping and then the rolling cutter breaks the rock. Second, the temperature of a hybrid bit rises rapidly in the initial stage of rock breaking, and after a while it tends to be stable and the temperature increases with the increase of the weight on bit (WOB). Third, compared with a PDC bit or a cone bit, a hybrid bit has a lower temperature in the process of rock breaking. The rock-broken volume of the hybrid bit is larger than the sum of a single PDC bit and a single cone bit. Fourth, the rock breaking temperature of a hybrid bit in hard strata is higher than that in soft strata, while the resulted rate of penetration (ROP) is opposite. Fifth, a bit's rock breaking temperature and rock breaking characteristics are related to its own structure. In conclusion, the research results are conducive to the design optimization, popularization and application of hybrid bits.
Number of references: 24
Main heading: Temperature
Controlled terms: Rocks - Elastoplasticity
Uncontrolled terms: Design optimization - Drilling efficiency - Finite element analysis method - Lower temperatures - Rate of penetration - Simulation model - Temperature field change - Temperature increase
Classification code: 641.1 Thermodynamics
DOI: 10.3787/j.issn.1000-0976.2020.03.012
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

453. One-step fabrication and electromagnetic wave absorption of graphene/Ag@polyaniline ternary nanocomposites

Accession number: 20201608426659
Authors: Guo, Shaoli (1); Wen, Junqing (1); Song, Lina (1); Qu, Jinfeng (1); He, Wanlin (1); Liu, Shuai (1)
Author affiliation: (1) School of Science, Xi'an Shiyou University, Xi'an, Shaanxi; 710072, China
Corresponding author: Guo, Shaoli(guoshaoli@mail.nwpu.edu.cn)
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Abbreviated source title: Nanotechnology
Volume: 31
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Issue date: May 29, 2020
Publication year: 2020
Article number: 225606
Language: English
ISSN: 09574484
E-ISSN: 13616528
CODEN: NNOTER
Document type: Journal article (JA)
Publisher: IOP Publishing Ltd
Abstract: Based on in situ intercalation polymerization of aniline, a one-step synthesis of a graphene/Ag@PANI ternary composite is proposed. The results show that together with sunlight exposure, Ag+ induces the polymerization of aniline accompanied by self-reduction to form a Ag@PANI core-shell nanostructure, and consequently, exfoliates the graphite sheet into graphene. Through a PANI shell, Ag@PANI nanoparticles all anchor onto the surface of graphene, forming a stable ternary structure. The performance of graphene/Ag@PANI is closely related to its micro-morphology, which depends on the selected Ag+/aniline ratio during the synthesis. Double-layer absorbers with graphene/Ag@PANI as the absorbing layer present excellent absorption performance. The effective absorbing bandwidths of DB-10, DB-5, and DB-1 all exceed 3 GHz with a thickness of 1 mm and the reflection loss of 1.3 mm DB-10 reaches-44.5 dB at 10.5 GHz. The as-proposed facile and eco-friendly preparation of a graphene-based ternary composite is also of great significance for sensors, supercapacitor electronics, degradation of polymers, and other applications.
Number of references: 28
Main heading: Aniline
Controlled terms: Polyaniline - Polymerization - Morphology - Graphene - Electromagnetic wave absorption
Uncontrolled terms: Absorption performance - Core shell nano structures - Double-layer absorbers - Micromorphologies - One step synthesis - Ternary composites - Ternary nanocomposites - Ternary structure

Classification code: 708.2 Conducting Materials - 711 Electromagnetic Waves - 761 Nanotechnology - 804 Chemical Products Generally - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 815.2 Polymerization - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Frequency 1.05e+10Hz, Frequency 3.00e+09Hz, Size 1.00e-03m
DOI: 10.1088/1361-6528/ab7534
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

454. Identification of X-ray weld defects under artificial intelligence framework

Accession number: 20212210442206
Authors: Feng, Xiao-Xing (1); Gao, Wei-Xin (1); Wang, Zheng (1); Wu, Xiao-Meng (1)
Author affiliation: (1) College of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Feng, Xiao-Xing(1163806799@qq.com)
Source title: Proceedings - 2020 5th International Conference on Mechanical, Control and Computer Engineering, ICMCCE 2020
Abbreviated source title: Proc. - Int. Conf. Mech., Control Comput. Eng., ICMCCE
Part number: 1 of 1
Issue title: Proceedings - 2020 5th International Conference on Mechanical, Control and Computer Engineering, ICMCCE 2020
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Publication year: 2020
Pages: 1186-1189
Article number: 09421357
Language: English
ISBN-13: 9780738105208
Document type: Conference article (CA)
Conference name: 5th International Conference on Mechanical, Control and Computer Engineering, ICMCCE 2020
Conference date: December 25, 2020 - December 27, 2020
Conference location: Harbin, China
Conference code: 168952
Sponsor: AEIC Academic Exchange Information Center; Xijing University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In view of the need of automatic detection of weld defects, an automatic extraction and classification algorithm for welding defect features based on convolution neural network is proposed. The algorithm directly takes the preprocessed weld images as the input and the welding defect type as the output, effectively avoiding the adverse effect of artificial identification subjective experience on the detection results. The experimental results show that the welding defect identification technology based on convolution neural network has a good identification rate and can provide an important reference for the research of welding quality detection. © 2020 IEEE.
Number of references: 6
Main heading: Convolution
Controlled terms: Deep learning - Defects - Welding - Welds
Uncontrolled terms: Automatic Detection - Automatic extraction - Classification algorithm - Convolution neural network - Identification rates - Subjective experiences - Welding defects - Welding quality
Classification code: 461.4 Ergonomics and Human Factors Engineering - 538.2 Welding - 716.1 Information Theory and Signal Processing - 951 Materials Science
DOI: 10.1109/ICMCCE51767.2020.00261
Funding Details: Number: 8JS094, Acronym: -, Sponsor: -; Number: 2020GY-179, Acronym: -, Sponsor: -; Number: YCS19213103, Acronym: -, Sponsor: -;
Funding text: This paper is supported by the Key Project of Shaanxi Provincial Education Department(l 8JS094), Key R&D plan of Shananxi Province (2020GY-179) and Graduate innovation program of Xi'an Petroleum University (YCS19213103).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

455. Research of Downhole Instructions Decoding with Variable Drilling Fluid Displacement (*Open Access*)

Accession number: 20203809182377
Authors: Huo, Aiqing (1); Yang, Yuyan (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; 710000, China
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1617
Part number: 1 of 1
Issue: 1
Issue title: 2nd International Conference on Electronic Engineering and Informatics
Issue date: August 25, 2020
Publication year: 2020
Article number: 012084
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 2nd International Conference on Electronic Engineering and Informatics, EEI 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Lanzhou, China
Conference code: 162560
Publisher: Institute of Physics Publishing
Abstract: This paper studied a downlink communication mode in which the effective downhole control instruction was generated by the use of drilling fluid pump displacement to format three descending and three ascending pulse instruction encoding. The principle of the downlink communication was introduced. The encoding idea of the downlink instruction code with 5-bit pulse was described. This downlink code was used to compose the corresponding control instruction which includes the information of the tool face angle and the guide force percentage. The downhole pulse widths were recognized by using STM32 as a micro control chip. The corresponding control commands were identified through the development of the software in the downhole drilling tool. Laboratory ground experiments demonstrated the feasibility of this downlink transmission mode by using variable drilling fluid displacement and the achievability of instruction decoding software. © Published under licence by IOP Publishing Ltd.
Number of references: 14
Main heading: Drilling fluids
Controlled terms: Encoding (symbols) - Signal encoding - Infill drilling - Decoding - Optical pumping
Uncontrolled terms: Control instruction - Decoding software - Down-hole drilling - Downlink communications - Downlink transmissions - Fluid displacement - Ground experiments - Instruction encoding
Classification code: 511.1 Oil Field Production Operations - 716.1 Information Theory and Signal Processing - 723.2 Data Processing and Image Processing
DOI: 10.1088/1742-6596/1617/1/012084
Funding Details: Number: 2020GY-152, Acronym: -, Sponsor: -; Number: 17JS108, Acronym: -, Sponsor: Scientific Research Foundation of Shaanxi Provincial Key Laboratory;
Funding text: This paper was supported by Key Laboratory Scientific Research Project of Shaanxi Provincial Department of Education(17JS108); General project of Shaanxi Provincial Department of Science and Technology-Industrial field(2020GY-152).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

456. The design of the algorithm for measuring the straightness of deep hole based on matlab (*Open Access*)

Accession number: 20204809532045
Authors: Liu, YanShu (1); Wang, Chi (1); Wang, Yu (1); Liu, Hui (1); Wang, Kun (1)
Author affiliation: (1) Department of Mechanical Engineering, Xi'an Shiyou University, Xi'an, Shaanxi, China
Corresponding author: Wang, Chi(wangchi123456@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.

Volume: 1653
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Issue: 1
Issue title: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar
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Conference name: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar, ICAMIM 2020
Conference date: August 21, 2020 - August 23, 2020
Conference location: Guilin, China
Conference code: 164482
Publisher: IOP Publishing Ltd
Abstract: Straightness of deep hole is an important quality index of deep hole parts. Due to the different methods of detecting the straightness of deep hole, the accuracy of the mathematical model for straightness evaluation is also different. In order to get a more accurate measurement method, this paper through the bus measurement, using the principle of least square method to evaluate straightness, establishes a mathematical model suitable for the measurement method, and uses MATLAB software to compile the data processing program. The automatic calculation of straightness error is realized, and the feasibility of the algorithm is verified by simulation experiment. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 5
Main heading: MATLAB
Controlled terms: Data handling - Least squares approximations
Uncontrolled terms: Accurate measurement - Automatic calculations - Deep holes - Least square methods - Matlab- software - Measurement methods - Quality indices - Straightness errors
Classification code: 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 921 Mathematics - 921.6 Numerical Methods
DOI: 10.1088/1742-6596/1653/1/012037
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

457. Digital documentation and data management for offshore drilling

Accession number: 20205109630029
Authors: Cheng, Zhong (1, 2); Xu, Rongqiang (2); Yu, Xiaolong (2); Hao, Zhouzheng (2); Ding, Xiangxiang (2); Li, Man (2); Li, Mingming (2); Li, Tiantai (1); Gao, Jiaxuan (1)
Author affiliation: (1) Xi'an Shiyou University; (2) CNOOC Ener Tech-Drilling and Production Co.
Source title: Society of Petroleum Engineers - SPE Asia Pacific Oil and Gas Conference and Exhibition 2020, APOG 2020
Abbreviated source title: Soc. Pet. Eng. - SPE Asia Pac. Oil Gas Conf. Exhib., APOG
Part number: 1 of 1
Issue title: Society of Petroleum Engineers - SPE Asia Pacific Oil and Gas Conference and Exhibition 2020, APOG 2020
Issue date: 2020
Publication year: 2020
Language: English
ISBN-13: 9781613997093
Document type: Conference article (CA)
Conference name: SPE Asia Pacific Oil and Gas Conference and Exhibition 2020, APOG 2020
Conference date: November 17, 2020 - November 19, 2020
Conference location: Virtual, Online
Conference code: 165206
Publisher: Society of Petroleum Engineers

Abstract: Upstream Oil & Gas industry recognizes that there are significant gains to be had by the implementation of new digital technologies. For offshore exploration and development, the goal is to bring together all domains, all data, and all engineering requirements in a seamlessly interconnected solution. The industry is putting significant efforts into using instrumentation and software to optimize operations in all domains for exploration and production (E&P) to move towards the digital oil field of the future. an innovative digital solution has been designed and implemented to cover all different aspects of the well planning and engineering workflows, delivering a step change in terms of capabilities and efficiency. As part of this transformation process, CNOOC have implemented integrated data management project of geological engineering for covering all different aspects of the well engineering workflows, delivering a step change in terms of capabilities and efficiency. The objective is to provide a continuous improvement platform to users for: Digitalization can reduce the time spent with daily documentation and simultaneously increase the quality by removing an error prone way of work. Technological solution enabling real-time data transmission from all rigs to CNOOC onshore headquarters and enabling real-time visualizations of the drilling data. This includes workload, number of needed rigs, daily performance, key performance indicators and even operation time forecasts based on real data. Engineering solution to transform expert experience and accident cases into information to easily identify the areas of operational improvement allowing to implement specific measures to reduce intangible loss time (ILT) and non-productive time (NPT) which can help in reducing costs. This project has also provided a real geological drilling environment where high frequency real-time drilling data is utilized along with low frequency daily drilling report data to provide better insights for well planning and generate ideas for improving performance and reducing risk. This paper presents a full description of a new industry standard digital well construction solution that has the potential to transform the well operation process by providing a step change in collaboration, concurrent engineering, automation, and data analytics. Furthermore, the cloud-deployed solution challenges will be briefly discussed. The learned lessons and gained experiences from this project construction presented here provide valuable guidance for future demands E&P and digital transformation. Copyright 2020, Society of Petroleum Engineers.
Number of references: 7
Main heading: Efficiency
Controlled terms: Benchmarking - Gas industry - Infill drilling - Offshore oil well production - Cost engineering - Data Analytics - Gasoline - Information management - Offshore oil wells - Concurrent engineering - Offshore drilling - Metadata - Oil field development
Uncontrolled terms: Continuous improvements - Digital oil field of the futures - Exploration and productions - Integrated data management - Key performance indicators - Operational improvements - Real time data transmission - Real time visualization
Classification code: 511.1 Oil Field Production Operations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 522 Gas Fuels - 523 Liquid Fuels - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 911 Cost and Value Engineering; Industrial Economics - 913.1 Production Engineering - 913.6 Product Development; Concurrent Engineering
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

458. Dynamic Modeling of Gear System Based on 3D Finite Element Model and Its Application in Spalling Fault Analysis (*Open Access*)

Accession number: 20201508392916
Authors: Wan, Zhiguo (1); Dou, Yihua (1); Guan, Yuan (1); Meng, Qi (1); Li, Suobin (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Wan, Zhiguo(zgwan@xsyu.edu.cn)
Source title: Mathematical Problems in Engineering
Abbreviated source title: Math. Probl. Eng.
Volume: 2020
Issue date: 2020
Publication year: 2020
Article number: 2859310
Language: English
ISSN: 1024123X
E-ISSN: 15635147
Document type: Journal article (JA)
Publisher: Hindawi Limited, 410 Park Avenue, 15th Floor, 287 pmb, New York, NY 10022, United States
Abstract: A reduced-order dynamic model, based on three-dimensional (3D) finite element model (FEM) and component modal synthesis technique (CMS), was presented for simulating the dynamic behavior of the spur gear

system. The gear shaft and gear body were established via 3D elements to simulate bending and torsion of the gear system. The CMS technique was used to generate a reduced-order model of a spur gear system. A pair of mating teeth was assimilated to two different foundations (one for the pinion tooth and the other one for the gear tooth) linked in series by some independent springs, which was used to simulate the contact stiffness. The validity of the proposed model was verified by static analysis, dynamic analysis, and experimental analysis. The results show that the proposed model is an effective model. In addition, the proposed model has also been applied to analyze spur gear spalling faults. The results show that the dynamic response of the gear system is periodic vibration shock response due to the alternate meshing of single and double teeth. When the spalling fault occurs, some shock responses with significantly enhanced amplitude will be generated as the result of contact loss. © 2020 Zhiguo Wan et al.
Number of references: 27
Main heading: Spur gears
Controlled terms: 3D modeling - Modal analysis - Spalling - Vibrations (mechanical) - Three dimensional computer graphics - Finite element method
Uncontrolled terms: 3D finite element model - Component modal synthesis - Contact stiffness - Dynamic behaviors - Experimental analysis - ITS applications - Reduced order models - Three-dimensional (3D) finite element models
Classification code: 601.2 Machine Components - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 921 Mathematics - 921.6 Numerical Methods - 931.1 Mechanics
DOI: 10.1155/2020/2859310
Compendex references: YES
Open Access type(s): All Open Access, Bronze, Green
Database: Compendex
Data Provider: Engineering Village

459. Design and analysis of hybrid domestic gas supply system with biomass energy and hydrocarbons (*Open Access*)

Accession number: 20204809531258
Authors: Gao, Lin (1); Wu, Song (1); Zhang, Xiong (1); Zhu, Jingqi (1); Fang, Qichao (1)
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Corresponding author: Gao, Lin(gldut@126.com)
Source title: IOP Conference Series: Earth and Environmental Science
Abbreviated source title: IOP Conf. Ser. Earth Environ. Sci.
Volume: 585
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Issue title: 2020 6th International Conference on Energy, Environment and Materials Science
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Article number: 012006
Language: English
ISSN: 17551307
E-ISSN: 17551315
Document type: Conference article (CA)
Conference name: 2020 6th International Conference on Energy, Environment and Materials Science, EEMS 2020
Conference date: August 28, 2020 - August 30, 2020
Conference location: Hulun Buir, China
Conference code: 164813
Publisher: IOP Publishing Ltd
Abstract: A new gas supply system for residents was designed, taking puleyuan village as the research object. Aiming at the rural areas with abundant biomass energy and considering the seasonal difference of gas supply to residents, the gas supply system with biomass gasification coupled with hydrocarbons was used. Through the analysis of the system design principle, the calculation of combustible mixture property and the numerical calculation of energy conversion process, the energy efficiency design of the system was analyzed and optimized in this paper. At the same time, the system was evaluated from the economic perspective of energy conservation and emission reduction, compared with those of traditional fossil energy heating. The results showed that the gas supply system could bring considerable economic and environmental benefits, and it was feasible and expansible to implement in the rural areas in the north of China and the southern areas where winter heating was needed. © Published under licence by IOP Publishing Ltd.

Number of references: 10
Main heading: Rural areas
Controlled terms: Biomass - Emission control - Energy conversion - Hydrocarbons - Energy efficiency - Gas emissions
Uncontrolled terms: Biomass Gasification - Combustible mixture - Design and analysis - Economic and environmental benefits - Economic perspective - Energy conservation and emission reductions - Numerical calculation - Seasonal differences
Classification code: 451.2 Air Pollution Control - 525.2 Energy Conservation - 525.5 Energy Conversion Issues - 804.1 Organic Compounds
DOI: 10.1088/1755-1315/585/1/012006
Funding Details: Number: -, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: Supported by Natural Science Foundation of Shaanxi Province of China. (NO.2019JQ-826)
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

460. Design and finite element analysis of axial low-frequency vibration tool-holder (*Open Access*)

Accession number: 20204809532048
Authors: Liu, Zhanfeng (1); Liu, Hui (1); Zhao, Dezhong (1); Wang, Chi (1); Wang, Tianqi (1)
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Source title: Journal of Physics: Conference Series
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Issue title: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar
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Conference name: 2020 International Conference on Advanced Materials and Intelligent Manufacturing and Advanced Steel for Automotive Seminar, ICAMIM 2020
Conference date: August 21, 2020 - August 23, 2020
Conference location: Guilin, China
Conference code: 164482
Publisher: IOP Publishing Ltd
Abstract: Vibration-assisted drilling can significantly reduce the drilling force and cutting heat during deep hole machining, improve tools life and hole machining quality. As a branch of vibration drilling technology, axial low-frequency vibration-assisted drilling has a broad application prospect in the field of drilling because of its simple structure and easy implementation. A mechanical axial low-frequency vibrating tool-holder (ALVT) is designed, and the overall structure layout and working principle of the vibrating tool-holder are analyzed. The rotary motion of the machine tool spindle is used as the power input to drive the sinusoidal surface to rotate to achieve the amplitude output. The vibrating tool-holder model is simplified, and the ABAQUS finite element software is used to simulate the titanium alloy material for ordinary drilling and axial low-frequency vibration drilling (ALVD), and the axial force and cutting temperature changes are compared and analyzed. The results show that ALVD of titanium alloy can reduce the average axial force by about 47% and the cutting temperature by about 11%, which can significantly improve the drilling conditions and the quality of hole machining. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 13
Main heading: Titanium alloys
Controlled terms: ABAQUS - Infill drilling - Cutting - Machine tools - Vibration analysis - Finite element method

Uncontrolled terms: Abaqus finite element software - Cutting temperature - Low-frequency vibration - Machine tool spindles - Machining quality - Sinusoidal surfaces - Vibration assisted drilling - Vibration drilling
Classification code: 511.1 Oil Field Production Operations - 542.3 Titanium and Alloys - 603.1 Machine Tools, General - 723.5 Computer Applications - 921 Mathematics - 921.6 Numerical Methods
Numerical data indexing: Percentage 1.10e+01%, Percentage 4.70e+01%
DOI: 10.1088/1742-6596/1653/1/012040
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Funding text: Funded Project of Xi'an Shiyou University Graduate Student Innovation and Practice Ability Training. (YCS19112030)
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

461. Improved Metric Factorization Recommendation Algorithm Based on Social Networks and Implicit Feedback (*Open Access*)

Accession number: 20204809523993
Authors: Wang, Bilin (1); Han, Jiaxin (1); Cuan, Ying (1)
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Source title: Journal of Physics: Conference Series
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Issue title: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
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Publication year: 2020
Article number: 012037
Language: English
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Conference name: 2020 3rd International Conference on Computer Information Science and Application Technology, CISAT 2020
Conference date: July 17, 2020 - July 19, 2020
Conference location: Dali, China
Conference code: 164232
Publisher: IOP Publishing Ltd
Abstract: The Metric Factorization algorithm solves the problem of the suboptimal solution caused by the inner product of the traditional matrix factorization algorithm. Although the basic metric factorization model has achieved good results in rating prediction and item ranking tasks, the algorithm ignores the role of implicit feedback and user social information. Considering the social relationship and implicit feedback information between users, this paper improves the basic metric factor Factorization algorithm, and proposes an improved metric factorization recommendation algorithm based on social networks and implicit feedback. We do rating prediction tasks on the Filmtrust and Last.FM datasets, experimental results show that the improved algorithm can further improve the accuracy of prediction. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Factorization
Controlled terms: Social aspects - Forecasting
Uncontrolled terms: Factorization algorithms - Factorization model - Implicit feedback - Matrix factorizations - Recommendation algorithms - Social information - Social relationships - Suboptimal solution
Classification code: 901.4 Impact of Technology on Society - 921 Mathematics
DOI: 10.1088/1742-6596/1634/1/012037
Funding Details: Number: YCS20113060, Acronym: -, Sponsor: -;
Funding text: This work was financially supported by the Xi’an shiyou University Graduate Innovation and Practice Ability Development Project (YCS20113060).

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Database: Compendex
Data Provider: Engineering Village

462. Study on the economic insulation thickness of the buried hot oil pipelines based on environment factors (*Open Access*)

Accession number: 20202708902058
Authors: Fan, Shihao (1); Chang, Mingliang (1); Wang, Shouxi (1); Quan, Qing (1); Wang, Yong (1); Li, Dan (1)
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Source title: CMES - Computer Modeling in Engineering and Sciences
Abbreviated source title: CMES Comput. Model. Eng. Sci.
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Issue date: 2020
Publication year: 2020
Pages: 45-59
Language: English
ISSN: 15261492
E-ISSN: 15261506
Document type: Journal article (JA)
Publisher: Tech Science Press
Abstract: It is important to determine the insulation thickness in the design of the buried hot oil pipelines. The economic thickness of the insulation layer not only meets the needs of the project but also maximizes the investment and environmental benefits. However, as a significant evaluation, the environmental factors haven't been considered in the previous study. Considering this factor, the mathematical model of economic insulation thickness of the buried hot oil pipelines is built in this paper, which is solved by the golden section method while considering the costs of investment, operation, environment, the time value of money. The environmental cost is determined according to the pollutant discharge calculated through relating heat loss of the pipelines to the air emission while building the model. The results primarily showed that the most saving fuel is natural gas, followed by LPG, fuel oil, and coal. The fuel consumption for identical insulation thickness is in the order: coal, fuel oil, LPG, and natural gas. When taking the environmental costs into account, the thicker the economic insulation layer is, the higher cost it will be. Meanwhile, the more pollutant discharge, the thicker the economic insulation layer will be. © 2020 Tech Science Press. All rights reserved.
Number of references: 26
Main heading: Insulation
Controlled terms: Liquefied petroleum gas - Natural gas - Costs - Pollution
Uncontrolled terms: Buried hot oil pipeline - Environmental benefits - Environmental costs - Environmental factors - Golden section method - Insulation thickness - Pollutant discharges - Time value of money
Classification code: 413 Insulating Materials - 522 Gas Fuels - 523 Liquid Fuels - 911 Cost and Value Engineering; Industrial Economics
DOI: 10.32604/cmes.2020.08973
Funding Details: Number: YCS19113037, Acronym: -, Sponsor: -; Number: 51704236, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was funded by the National Natural Science Foundation of China (NO. 51704236), the Graduate Innovation and Practice Ability Development Program of Xi'an Shiyou University (NO. YCS19113037).Acknowledgement: The authors are thankful for the support from the National Natural Science Foundation of China (NO. 51704236), the Graduate Innovation and Practice Ability Development Program of Xi'an Shi you University (NO. YCS19113037).Funding Statement: This work was funded by the National Natural Science Foundation of China (NO. 51704236), the Graduate Innovation and Practice Ability Development Program of Xi'an Shiyou University (NO. YCS19113037).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
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Data Provider: Engineering Village

463. Research on optimization of cathodic protection effect of buried pipeline

Accession number: 20205109638706
Authors: Zhang, Qizhi (1, 2); Li, Lin (1, 2); Quan, Bo (3)
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Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
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Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
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Article number: 9239826
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Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: Cathodic protection is an important means to inhibit the electrochemical corrosion of pipelines, and the distribution of its potential directly affects the effectiveness of pipeline protection. By establishing a mathematical model of pipeline cathodic protection and using numerical simulation methods to study the distribution rule of pipeline cathodic protection potential, the main factors affecting the distribution of pipeline cathodic protection potential are determined by the embedding position and output current value of auxiliary anode. Then, the optimal buried position of the anode and the optimal output current value of the anode are used as optimization objectives to establish an objective function, and the optimal anode position and optimal anode output current value are searched out by the simulated annealing algorithm. Finally, the feasibility of the optimization scheme is verified based on the actual protection potential of the pipeline, and the results prove that the method has certain reference value for the design of cathodic protection. © 2020 IEEE.
Number of references: 10
Main heading: Simulated annealing
Controlled terms: Pipelines - Numerical methods - Electrochemical corrosion - Pipeline corrosion - Anodes - Cathodic protection - Corrosion inhibitors - MATLAB
Uncontrolled terms: Cathodic protection potentials - Distribution rule - Numerical simulation method - Objective functions - Optimization scheme - Pipeline protection - Protection potential - Simulated annealing algorithms
Classification code: 537.1 Heat Treatment Processes - 539.1 Metals Corrosion - 539.2 Corrosion Protection - 539.2.1 Protection Methods - 619.1 Pipe, Piping and Pipelines - 714.1 Electron Tubes - 723.5 Computer Applications - 801.4.1 Electrochemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 921 Mathematics - 921.6 Numerical Methods
DOI: 10.1109/ICCNEA50255.2020.00078
Funding Details: Number: 2017ZDXM-GY-097, Acronym: -, Sponsor: -;
Funding text: This work is supported by Xi'an Shiyou University Graduate Innovation and Practice Ability Training Program and the Shaanxi Provincial Key R&D Program "Drilling Machine Control Virtual Simulation Software Development, project number: 2017ZDXM-GY-097.This work is supported by Xi'an Shiyou University Graduate Innovation and Practice Ability Training Program and the Shaanxi Provincial Key R&D Program "Drilling Machine Control Virtual Simulation Software Development, project number: 2017ZDXM-GY-097.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

464. Atomic insight into the interfacial bonding and role of carbon atoms on β–SiC(1 1 1)/ Al2MgC2(0 0 0 1): A first-principles study

Accession number: 20200608143353
Authors: Li, Jian (1); Zhang, Ming (2); Zhao, Junyu (1); Cui, Youming (1); Luo, Xian (3)
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Corresponding author: Li, Jian(lijian@xsyu.edu.cn)
Source title: Applied Surface Science
Abbreviated source title: Appl Surf Sci
Volume: 511
Issue date: 1 May 2020
Publication year: 2020
Article number: 145633
Language: English
ISSN: 01694332
CODEN: ASUSEE
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: Al2MgC2 may form on the interface of SiC/Mg composite, and as substrate of heterogeneous nucleation, Al2MgC2 could refine α–Mg grain. So, interface system SiC/Al2MgC2/Mg is interesting to be further clarified, while the study about SiC/Al2MgC2 is still insufficient. In present work, interfacial bonding on SiC(1 1 1)/Al2MgC2(0 0 0 1) and role of carbon atoms are investigated by using density functional theory (DFT) method. Considering different interfacial termination and stacking sites, totally 18 models are examined. Si/C-terminated and top-site stacked model (denoted as Si/C_top) is identified as the most stable one. Interfacial fracture toughness is predicted as critical stress intensity factor KIcint = 2.34~2.99 MPam1/2. Interfacial bonding mostly contributes from carbon atoms, which behave as charge acceptors, and charge transfer between interfacial C-Si atoms is confirmed. Peaks in PDOS of interfacial C atoms shift towards negative side. Especially for C atom in SiC(1 1 1), shift from -1.33 eV to less than -2.9 eV, which generates stronger interfacial bonding. For C atom in Al2MgC2(0 0 0 1), new peak forms around -8.08 eV, and mainly from C-2p2 orbital. Meanwhile, its s orbital peak negatively shifts from -9.71 eV to -11.61 eV. The interfacial Si-C covalent bonds are predominantly composed as hybridizations of C-2p2 and Si-3s2 around -8.1 eV, C-2p2 and Si-3s2 around -11.5 eV. © 2020 Elsevier B.V.
Number of references: 70
Main heading: Silicon carbide
Controlled terms: Magnesium compounds - Nucleation - Calculations - Chemical bonds - Atoms - Silicon - Charge transfer - Fracture toughness - Density functional theory - Aluminum compounds - Carbon
Uncontrolled terms: C atoms - Critical stress intensity factor - Density functional theory methods - DFT calculation - Heterogeneous nucleation - Interfacial bonding - Interfacial fracture toughness - SiC(1 1 1)/ Al2MgC2(0 0 0 1)
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 804 Chemical Products Generally - 804.2 Inorganic Compounds - 921 Mathematics - 922.1 Probability Theory - 931.3 Atomic and Molecular Physics - 931.4 Quantum Theory; Quantum Mechanics - 933.1.2 Crystal Growth
DOI: 10.1016/j.apsusc.2020.145633
Funding Details: Number: -, Acronym: NPU, Sponsor: Northwestern Polytechnical University; Number: 2019JM-388, Acronym: -, Sponsor: -; Number: 2015BS12, Acronym: -, Sponsor: -; Number: 15JK1570, Acronym: -, Sponsor: -;
Funding text: The authors acknowledge the financial supports from the Natural Science Basic Research Program of Shaanxi (Program No. 2019JM-388), Scientific Research Program of Shaanxi Provincial Education Department (Program No. 15JK1570), and Science and Technology Innovation Fund of Xi'an Shiyou University (Program No. 2015BS12). The authors also acknowledge the support from Center for High Performance Computing of Northwestern Polytechnical University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

465. Real-time insulation monitoring system for electric submersible pump (*Open Access*)

Accession number: 20204809536132
Authors: Wang, Min (1); Liu, Shenghu (1); Song, Nan (2); Dang, Bo (2); Ren, Zhiping (3)

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Corresponding author: Wang, Min(785645330@qq.com)
Source title: Journal of Physics: Conference Series
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Volume: 1654
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Issue: 1
Issue title: 2020 International Conference on Mechatronics Technology and Intelligent Manufacturing, ICMTIM 2020
Issue date: October 29, 2020
Publication year: 2020
Article number: 12128
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Conference on Mechatronics Technology and Intelligent Manufacturing, ICMTIM 2020
Conference date: August 28, 2020 - August 30, 2020
Conference location: Xi'an, China
Conference code: 164483
Publisher: IOP Publishing Ltd
Abstract: As one of the most important mechanical oil production equipment in the process of oil and gas production, electric submersible pump has a cycle of up to half a year for working. During the operation of the electric submersible pump, the insulation condition of the system will gradually aging, resulting in defects in the system and causing destructive failure. In order to solve this problem, this paper designs a real-time monitoring system for the insulation condition of electric submersible pump, and constructs the indoor well condition simulation experiment. Compared with the existing insulation detection technology, the monitoring technology is simple and does not need professional technical support from inspectors. © 2020 Institute of Physics Publishing. All rights reserved.
Number of references: 7
Main heading: Submersible pumps
Controlled terms: Electric insulation - Submersibles - Monitoring
Uncontrolled terms: Electric submersible pumps - Insulation conditions - Insulation detections - Insulation monitoring systems - Monitoring technologies - Oil and gas production - Real time monitoring system - Technical support
Classification code: 618.2 Pumps - 674.1 Small Marine Craft
DOI: 10.1088/1742-6596/1654/1/012128
Funding Details: Number: 41874158,51974250, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 17JS106, Acronym: -, Sponsor: Education Department of Shaanxi Province; Number: YCS19113052, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2018JQ5133, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: This paper was supported by Postgraduate Innovation and practical ability training program of Xi'an Shiyou University (YCS19113052); National Natural Science Foundation of China (51974250); National Natural Science Foundation of China (41874158); Natural Science Basic Research Program of Shaanxi(2018JQ5133); Key laboratory project of Shaanxi Provincial Department of Education (17JS106).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

466. Real Time Trajectory Parameters Measurement on Machine Learning for Intelligent Drilling

Accession number: 20210910007872
Authors: Gao, Yi (1); Guo, Chao (1); Li, Fei (1); Mao, Yanhui (1)
Author affiliation: (1) Xi'an Shiyou University, School of Electronic Engineering, Xi'an, Shaanxi; 710065, China
Source title: 2020 10th International Conference on Power and Energy Systems, ICPES 2020
Abbreviated source title: Int. Conf. Power Energy Syst., ICPES

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Issue title: 2020 10th International Conference on Power and Energy Systems, ICPES 2020
Issue date: December 25, 2020
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Language: English
ISBN-13: 9781665404945
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Conference name: 10th International Conference on Power and Energy Systems, ICPES 2020
Conference date: December 25, 2020 - December 27, 2020
Conference location: Virtual, Chengdu, China
Conference code: 167217
Sponsor: IEEE; IEEE Power and Energy Society; University of Electronic Science and Technology of China
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In view of the complex geological conditions, the drilling project will encounter a large number of difficult wells, special wells, etc. It is difficult to obtain wellbore trajectory parameters in real time. With the continuous development of petroleum industry and the progress of science and technology, drilling technology will enter a new stage of artificial intelligence drilling, and petroleum technology will develop towards information, intelligence, integration and visualization. For control well trajectory effectively, real-time and high-precision well trajectory parameters can be obtained. A real-time borehole trajectory measurement method for intelligent drilling based on machine learning is proposed. Intelligent downhole tools through machine learning, implant the knowledge system of various industry experts related to drilling into downhole machines. The database is installed in the intelligent expert system to provide a reference for real-time data analysis in the underground, so as to realize intelligent control of the drill bit trajectory. The parameters of the wellbore trajectory are monitored, collected, controlled, decided and processed in real time by the downhole machine, which no longer need to be transmitted to the surface system through the cable or mud pulse method.Therefore, realize precise control of borehole trajectory, improve the accuracy and efficiency of intelligent drilling. © 2020 IEEE.
Number of references: 14
Main heading: Trajectories
Controlled terms: Oil field equipment - Learning systems - Machine learning - Boreholes - Oil wells - Gasoline - Expert systems - Petroleum industry - Infill drilling
Uncontrolled terms: Borehole trajectories - Complex geological condition - Continuous development - Intelligent drilling - Intelligent expert systems - Real time data analysis - Real-time trajectories - Science and Technology
Classification code: 511.1 Oil Field Production Operations - 511.2 Oil Field Equipment - 512.1.1 Oil Fields - 523 Liquid Fuels - 723.4 Artificial Intelligence - 723.4.1 Expert Systems
DOI: 10.1109/ICPES51309.2020.9349639
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

467. Based on Randomly Executed Sequence and GA-SVC Applied on Air Quality Analysis (*Open Access*)

Accession number: 20202808920629
Authors: Wei, Fan (1); Sun, Honglin (1)
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Source title: Journal of Physics: Conference Series
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Issue title: 2020 4th International Workshop on Advanced Algorithms and Control Engineering, IWAACE 2020 - Machine Learning, Intelligent Data Analysis and Data Mining
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Publication year: 2020
Article number: 032104
Language: English

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Conference name: 2020 4th International Workshop on Advanced Algorithms and Control Engineering, IWAACE 2020
Conference date: February 21, 2020 - February 23, 2020
Conference location: Shenzhen, China
Conference code: 161276
Publisher: Institute of Physics Publishing
Abstract: Air quality is a key factor affecting people's daily travel. In order to analyze and classify air quality, and to solve the problem of low classification accuracy, this paper mainly studied the SVC (multi-classification support vector machine) Algorithm based on the random sequence selection of optimized parameters through Genetic Algorithm. Aiming at the problems of insufficient classification accuracy in current multi-feature sequence analysis and unstable parameter selection in SVC algorithm, comprehensive classification evaluation of data is carried out by analyzing data features and correlation among features and integrating genetic algorithm into SVC to optimize parameter selection, so as to improve classification accuracy. The experimental results show that the classification accuracy has been improved by 5% on average with the current popular decision tree classification algorithm, unoptimized SVC algorithm and KNN algorithm. © Published under licence by IOP Publishing Ltd.
Number of references: 12
Main heading: Air quality
Controlled terms: Data mining - Decision trees - Classification (of information) - Genetic algorithms - Parameter estimation - Quality control - Support vector machines
Uncontrolled terms: Classification accuracy - Classification evaluation - Decision tree classification - Multi features - Multi-classification - Optimized parameter - Parameter selection - Random sequence
Classification code: 451.2 Air Pollution Control - 716.1 Information Theory and Signal Processing - 723 Computer Software, Data Handling and Applications - 723.2 Data Processing and Image Processing - 903.1 Information Sources and Analysis - 913.3 Quality Assurance and Control - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
Numerical data indexing: Percentage 5.00e+00%
DOI: 10.1088/1742-6596/1550/3/032104
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

468. Reactive power optimization of distributed photovoltaic access distribution network based on improved multi-objective particle swarm optimization (*Open Access*)

Accession number: 20204809523984
Authors: Xiaomeng, Wu (1); Mingyue, Yang (1)
Author affiliation: (1) Electronic Engineering, School of xi'An Shiyou University, Xi'an, Shaanxi; 710065, China
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Conference date: July 17, 2020 - July 19, 2020
Conference location: Dali, China

Conference code: 164232
Publisher: IOP Publishing Ltd
Abstract: With the widespread development of distributed power generation technology, photovoltaic power generation has been widely used. Aiming at the past, the reactive power optimization algorithm with distributed photovoltaic access distribution network needs to convert the multi-objective problem into a single-objective solution process where the weight setting is not objective. This paper proposes a multi-objective optimization algorithm based on improved particle swarm optimization algorithm. The multi-objective model based on Pareto optimal solution is used to obtain the Pareto optimal solution set, and the optimal solution is selected from it. At the same time, the algorithm is improved, the external file is used to update the optimal position of the particle, the population diversity is increased to avoid premature problems, and the performance of the algorithm is improved by analyzing the test function. Through modeling, the influence of distributed photovoltaic power generation on the power grid is studied, and simulation is performed in the IEEE-33 node system. The simulation results prove the feasibility of the improved algorithm in this paper. © Published under licence by IOP Publishing Ltd.
Number of references: 8
Main heading: Multiobjective optimization
Controlled terms: Optimal systems - Distributed power generation - Reactive power - Solar energy - Electric power transmission networks - Pareto principle - Particle swarm optimization (PSO)
Uncontrolled terms: Improved particle swarm optimization algorithms - Multi objective particle swarm optimization - Multi-objective modeling - Multi-objective problem - Pareto optimal solutions - Photovoltaic power generation - Population diversity - Reactive power optimization
Classification code: 657.1 Solar Energy and Phenomena - 706.1.1 Electric Power Transmission - 706.1.2 Electric Power Distribution - 723 Computer Software, Data Handling and Applications - 921.5 Optimization Techniques - 961 Systems Science
DOI: 10.1088/1742-6596/1634/1/012028
Funding Details: Number: 18JS094, Acronym: -, Sponsor: -; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
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Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
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469. Research on Non-destructive Testing Method of Coating Thickness of Turbine Blade (*Open Access*)

Accession number: 20203809182386
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Language: English
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Conference name: 2020 2nd International Conference on Electronic Engineering and Informatics, EEI 2020
Conference date: July 17, 2020 - July 19, 2020
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Conference code: 162560

Publisher: Institute of Physics Publishing
Abstract: Turbine blades are an important component of the turbine section of a gas turbine engine. High-temperature blade coating is a key technology for the manufacture of turbine engines, and its complex surface structure is currently lacking an effective non-destructive evaluation method for coating thickness. In this paper, the eddy current field is directly exciting in the substrate metal of the turbine blade coating system to achieve non-destructive detection of the coating thickness and substrate material. The results show that a new method of coating non-destructive testing based on the principle of array induction logging three-coil system is proposed. The shielding coil effectively cancels the direct coupling signal and enhances the signal from the coating and the substrate; when the distance between the transmitting coil and the main receiving coil is 8cm and the scale factor α is about 0.7047, the signal-to-noise ratio is increased by 102 times, and when the scale factor α is about 0.9032, the signal-to-noise ratio is increased by 215 times, the focusing effect is obvious while the scale factor α raises, and the sensitivity is also greatly improved; the receiving array is more than 4cm away from the transmitting coil, reflecting the more obvious change of coating thickness. When the distance between the transmitting coil and the main receiving coil is 4#9cm, and the scale factor α is about 0.9032, the imaginary part of the measurement signal reflects the coating thickness changes more sensitively, and the real part of the measurement signal reflects substrate material changes more sensitively. © Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Turbomachine blades
Controlled terms: Bridge decks - Surface structure - Thickness measurement - Ultrasonic testing - Induction logging - Signal to noise ratio - Coatings - Eddy current testing - Turbine components
Uncontrolled terms: Coating thickness - Eddy current fields - Non destructive testing - Non-destructive evaluation methods - Nondestructive detection - Nondestructive testing method - Substrate material - Transmitting coils
Classification code: 401.1 Bridges - 512.1.2 Petroleum Deposits : Development Operations - 617 Turbines and Steam Turbines - 716.1 Information Theory and Signal Processing - 753.3 Ultrasonic Applications - 813.2 Coating Materials - 931.2 Physical Properties of Gases, Liquids and Solids - 943.2 Mechanical Variables Measurements
Numerical data indexing: Size 4.00e-02m, Size 8.00e-02m
DOI: 10.1088/1742-6596/1617/1/012093
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

470. Sustainable Business Model: A Bibliometric Study (*Open Access*)

Accession number: 20205209690950
Authors: Chang, Jing (1)
Author affiliation: (1) School of Economics and Management, Xi'an Shiyou University, Xi'an; 710065, China
Source title: E3S Web of Conferences
Abbreviated source title: E3S Web Conf.
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Issue title: 2020 International Symposium on Energy, Environmental Science and Engineering, ISEESE 2020
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Article number: 02010
Language: English
ISSN: 25550403
E-ISSN: 22671242
Document type: Conference article (CA)
Conference name: 2020 International Symposium on Energy, Environmental Science and Engineering, ISEESE 2020
Conference date: November 20, 2020 - November 22, 2020
Conference location: Chongqing, China
Conference code: 165721
Publisher: EDP Sciences
Abstract: Sustainability issues make the transformation to a more sustainable business model increasingly desirable. This study aims to analyze the literatures on SBM to provide a systematic review of the current status of the SBM literatures. This paper uses visual bibliometrics and comparative research methods to carry out collaboration, co-citation, and co-occurrence analyses of the literatures from the Web of Science by CiteSpace. Compared with the existing literature reviews of SBM, this paper makes a set of knowledge maps and analyzes visual results based on BMI-3 category framework to show the features of literatures, the future trend and the potential approac as contributing

to SBM. It is the first study to present the major clusters to reveal t air associated intellectual bases and research fronts in SBM. © The Authors, publis ad by EDP Sciences, 2020.
Number of references: 102
Main heading: Sustainable development
Uncontrolled terms: Co-occurrence analysis - Comparative research - Literature reviews - Research front - Sustainability issues - Sustainable business - Systematic Review - Web of Science
Classification code: 723.4 Artificial Intelligence
DOI: 10.1051/e3sconf/202021802010
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

471. Applications of micro-indentation technology to estimate fracture toughness of shale (*Open Access*)

Accession number: 20204209357754
Authors: Han, Qiang (1, 2); Qu, Zhan (1, 2); Wang, Ping (1, 2); Bi, Gang (1, 2); Qu, Guanzheng (1, 2)
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Corresponding author: Han, Qiang(qiangh@xsyu.edu.cn)
Source title: Materials
Abbreviated source title: Mater.
Volume: 13
Issue: 18
Issue date: September 2020
Publication year: 2020
Article number: 4208
Language: English
E-ISSN: 19961944
Document type: Journal article (JA)
Publisher: MDPI AG
Abstract: The fracture toughness of shale is a basic parameter that can provide effective theoretical support for wellbore stability and hydraulic fracturing of a shale reservoir. Due to the composition and microstructure, there are many problems in evaluating the mechanical properties of shale in a macroscopic test. In this paper, the composition and pore distribution of shale were studied by X-ray diffraction and nuclear magnetic resonance. Scanning electron microscopy was used to characterize the pore structure. The setting of experimental parameters and the selection of the indenter were discussed. Micro-indentation technique was proposed and applied to fracture toughness analysis of shale. The results show that Berkovich indenter is more suitable for shale indentation test than Vickers indenter. Fracture toughness of shale indentation is obviously affected by surface roughness and indentation position. Fracture toughness of shale decreases slightly with the increase of the indentation load. The energy analysis result presents that the effect of cracking on the ratio of total/unloading work is minimal when there is no significant stripping on the shale surface. Compared with the experimental method, energy methods can obtain all the analysis parameters from a single indentation test. The results of comparative analysis with macroscopic experiments display that micro-indentation test can effectively predict the macroscopic fracture toughness of shale. © 2020 by the authors.
Number of references: 35
Main heading: Fracture toughness
Controlled terms: Indentation - Shale - Pore structure - Scanning electron microscopy - Boreholes - Surface roughness
Uncontrolled terms: Berkovich indenters - Comparative analysis - Experimental methods - Experimental parameters - Macroscopic fractures - Micro-indentation technique - Micro-indentation tests - Wellbore stability
Classification code: 931.2 Physical Properties of Gases, Liquids and Solids
DOI: 10.3390/MA13184208
Funding Details: Number: 51704233,51974255, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019JQ-466,2019JQ-488, Acronym: -, Sponsor: Natural Science Basic Research Program of Shaanxi Province;
Funding text: Funding: This research was funded by National natural science foundation of China (Grant nos. 51704233 and 51974255), and Shaanxi province natural science basic research program (Grant nos. 2019JQ-466 and

2019JQ-488).This research was funded by National natural science foundation of China (Grant nos. 51704233 and 51974255), and Shaanxi province natural science basic research program (Grant nos. 2019JQ-466 and 2019JQ-488).
Compendex references: YES
Open Access type(s): All Open Access, Gold, Green
Database: Compendex
Data Provider: Engineering Village

472. Research on edge detection method based on improved HED network (*Open Access*)

Accession number: 20203709173336
Authors: Lou, Li (1); Zang, Shasha (1)
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Corresponding author: Lou, Li(zssjkb@126.com)
Source title: Journal of Physics: Conference Series
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Issue title: 2020 International Symposium on Electronic Information Technology and Communication Engineering
Issue date: August 17, 2020
Publication year: 2020
Article number: 012068
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Symposium on Electronic Information Technology and Communication Engineering, ISEITCE 2020
Conference date: June 19, 2020 - June 21, 2020
Conference location: Jinan, China
Conference code: 162447
Publisher: Institute of Physics Publishing
Abstract: Aiming at the problem of rough and fuzzy edges generated by the current edge detection technology based on HED network, an improved edge detection method for HED network is proposed. First, the useful information captured by each convolutional layer of HED becomes rougher as the size of the acceptance field increases. The improved HED network makes use of all the information of the convolution layer to capture more targets in a larger range, or make the local boundaries of the targets possible. The improved HED makes full use of the multi-scale and multi-level information of the target to obtain high-precision and high-quality edge maps, which lays a good foundation for image segmentation. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Image segmentation
Controlled terms: Image enhancement - Edge detection - Convolution - Information use
Uncontrolled terms: Edge detection methods - Edge detection technology - Edge map - High quality - High-precision - Multilevels
Classification code: 716.1 Information Theory and Signal Processing - 903.3 Information Retrieval and Use
DOI: 10.1088/1742-6596/1607/1/012068
Funding Details: Number: F020517, Acronym: IUSS, Sponsor: National Outstanding Youth Science Fund Project of National Natural Science Foundation of China; Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University;
Funding text: This work is supported by Xi'an Shiyou University Graduate Innovation and Practical Ability Training Program Funding and National Natural Science Foundation of China Youth Fund (F020517).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

473. Intelligent detection of building cracks based on deep learning

Accession number: 20203409067507
Authors: Zheng, Minjuan (1); Lei, Zhijun (1); Zhang, Kun (1)

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Corresponding author: Zheng, Minjuan(mjzheng@xsyu.edu.cn)
Source title: Image and Vision Computing
Abbreviated source title: Image Vision Comput
Volume: 103
Issue date: November 2020
Publication year: 2020
Article number: 103987
Language: English
ISSN: 02628856
CODEN: IVCODK
Document type: Journal article (JA)
Publisher: Elsevier Ltd
Abstract: In order to solve the damage caused by the concrete structure, which leads to the reduction of the life of infrastructure, endangers the safety of pedestrians, and has a serious impact on the social economy, building crack detection model of FCN (Fully Convolutional Networks), R-CNN (Regions with CNN feature) and RFCN (Richer Fully Convolutional Networks) has been proposed based on the convolutional neural network model to amplify and extract the features of the data and previous studies. Through the training of building surface data such as roads, bridges, houses and dams, the model is analyzed in terms of morphological and geometric indexes. Finally, the model of crack picture detection and segmentation based on deep learning is used for picture performance detection and comprehensive evaluation. The results show that: in the aspect of building gap detection, the RFCN model has the best processing effect, the gap recognition degree is higher, and the detail processing is better. In the aspect of model evaluation index, the correct rate of RFCN model is increased by 10%, the accuracy rate is increased by 12%, the recall rate is increased by 8%, the loss rate is increased by 3%, and the overall stability is higher. In the aspect of comprehensive performance, the picture processing performance is better than the FCN model by 7% and better than the R-CNN model by 15%, and the memory share is 80%. The fusion model based on deep learning and picture processing has been improved in many aspects, which can provide strong theoretical support and practical value for the detection and research of concrete surface cracks such as bridges, dams, highways and houses. © 2020 Elsevier B.V.
Number of references: 27
Main heading: Neural network models
Controlled terms: Concretes - Crack detection - Feature extraction - Learning systems - Damage detection - Deep learning - Pedestrian safety - Buildings - Convolution - Convolutional neural networks - Image segmentation
Uncontrolled terms: Comprehensive evaluation - Comprehensive performance - Concrete surface - Convolutional networks - Intelligent detection - Overall stabilities - Processing effects - Processing performance
Classification code: 402 Buildings and Towers - 406.2 Roads and Streets - 412 Concrete - 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence - 914.1 Accidents and Accident Prevention
Numerical data indexing: Percentage 1.00e+01%, Percentage 1.20e+01%, Percentage 1.50e+01%, Percentage 3.00e+00%, Percentage 7.00e+00%, Percentage 8.00e+00%, Percentage 8.00e+01%
DOI: 10.1016/j.imavis.2020.103987
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

474. Research on facial expression recognition based on neural network

Accession number: 20205109638827
Authors: Zhang, Zhiheng (1); Li, Ming (1)
Author affiliation: (1) Xi'An Shiyou University, School of Electronic Engineering Control Engineering, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
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Issue date: September 2020
Publication year: 2020

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Article number: 9239777
Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: For facial expression recognition, this paper proposes a cross-connected AlexNet improved convolutional neural network model. In general, due to lack of image information and noise interference, traditional machine learning methods lack robustness and poor recognition rate. Based on the advantages of deep learning in feature extraction, this paper adds a convolution layer and a pooling layer to the original AlexNet network structure, and uses the cross-connect method to extract low-level features from the network structure and combines advanced functions to construct a Classifier. The trainable features are used to extract feature convolution kernels, and then the pooling layer performs downsampling to eliminate unimportant information, reduce the amount of information calculation, and finally use the Softmax classifier for classification and recognition. Conduct comparative tests before and after the improvement to verify the performance improvement of the improved method. © 2020 IEEE.
Number of references: 9
Main heading: Convolution
Controlled terms: Classification (of information) - Face recognition - Learning systems - Convolutional neural networks - Deep learning - Neural network models
Uncontrolled terms: Advanced functions - Amount of information - Classification and recognition - Convolution kernel - Facial expression recognition - Low-level features - Machine learning methods - Noise interference
Classification code: 461.4 Ergonomics and Human Factors Engineering - 716.1 Information Theory and Signal Processing - 723.4 Artificial Intelligence - 903.1 Information Sources and Analysis
DOI: 10.1109/ICCNEA50255.2020.00025
Funding Details:
Funding text: This research was funded by the Innovation and Practice Ability Training Project of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

475. Research on TV imaging casing damage detection and classification method based on C4.5 decision tree (*Open Access*)

Accession number: 20200608140008
Authors: Cuan, Ying (1); Wang, Zeshang (1); Han, Jiaxin (1)
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Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1437
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Issue title: 2nd International Symposium on Big Data and Applied Statistics, ISBDAS 2019
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Publication year: 2020
Article number: 012132
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2019 2nd International Symposium on Big Data and Applied Statistics, ISBDAS 2019
Conference date: September 20, 2019 - September 22, 2019

Conference location: Dalian, China
Conference code: 157101
Publisher: IOP Publishing Ltd
Abstract: The casing damage is one of the important problems in oilfield development. The television imaging technology can get enough images of the inner wall of casing to detect the casing, but the efficiency of manually identifying the images is very low. Through the mapping relationship between image and casing damage type, the image features can be obtained. Then, the continuous data threshold selection of C4.5 decision tree algorithm is improved. Finally, the improved C4.5 decision tree algorithm is used to classify casing damage types. Experimental results show that the detection and classification method proposed in this paper can be well implemented. © Published under licence by IOP Publishing Ltd.
Number of references: 10
Main heading: Damage detection
Controlled terms: Data mining - Decision trees
Uncontrolled terms: C4.5 decision tree algorithm - C4.5 decision trees - Classification methods - Continuous data - Image features - Imaging technology - Mapping relationships - Threshold selection
Classification code: 723.2 Data Processing and Image Processing - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 961 Systems Science
DOI: 10.1088/1742-6596/1437/1/012132
Funding Details: Number: 51707158, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 2019KW-045, Acronym: -, Sponsor: Key Research and Development Program of Sichuan Province;
Funding text: This work was supported by the Key Research Development Program of Shaanxi Province (2019KW-045) and the National Natural Science Foundation of China (51707158).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

476. An Improved AdaBoost Algorithm for Hyperparameter Optimization (*Open Access*)

Accession number: 20204209357001
Authors: Gao, Rongfang (1); Liu, Zhanyu (1)
Author affiliation: (1) College of Computer Science and Technology, Xi'an Shiyou University, Xi'an, China
Corresponding author: Liu, Zhanyu(liu_nini@qq.com)
Source title: Journal of Physics: Conference Series
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Volume: 1631
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Issue title: 2nd International Conference on Artificial Intelligence and Computer Science
Issue date: September 23, 2020
Publication year: 2020
Article number: 012048
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2nd International Conference on Artificial Intelligence and Computer Science, AICS 2020
Conference date: July 25, 2020 - July 26, 2020
Conference location: Hangzhou, Zhejiang, China
Conference code: 163660
Publisher: IOP Publishing Ltd
Abstract: AdaBoost algorithm is a typical Boosting algorithm, which belongs to a successful representative in the Boosting family. This algorithm can upgrade a weak classifier with a better classification effect than random classification to a strong classifier with high classification accuracy, where n_estimators represents the number of iterations of the base classifier. If the value is too large, it will easily cause the model to overfit, if it is too small, it is easy. The model is under-fitting, and the parameter setting is not set randomly, but according to the current status of the data set. Aiming at the problem that the number of iterations in the AdaBoost algorithm is uncertain, this paper introduces a Bayesian optimization algorithm for hyperparameter tuning, which makes the value of hyper parameter in AdaBoost algorithm suitable for the current data set, and finally obtains a hyperparameter optimization AdaBoost algorithm. The experiment result shows the method that adopt Bayesian optimization algorithm for hyperparameter

optimization and apply the optimized hyperparameter value to the AdaBoost algorithm does not only improves the classification accuracy of the AdaBoost algorithm, but also avoids overfitting and underfitting of the model. © Published under licence by IOP Publishing Ltd.
Number of references: 8
Main heading: Uncertainty analysis
Controlled terms: Optimization - Adaptive boosting
Uncontrolled terms: AdaBoost algorithm - Bayesian optimization algorithms - Boosting algorithm - Classification accuracy - Hyper-parameter optimizations - Number of iterations - Parameter setting - Strong classifiers
Classification code: 723 Computer Software, Data Handling and Applications - 921.5 Optimization Techniques - 922.1 Probability Theory
DOI: 10.1088/1742-6596/1631/1/012048
Funding Details: Number: YCS20153001, Acronym: -, Sponsor: -;
Funding text: This paper is funded by The Graduate Student Innovation and Practice Ability Training Program of Xi 'an Shiyou University, Item Number (YCS20153001).
Compendex references: YES
Open Access type(s): All Open Access, Gold
Database: Compendex
Data Provider: Engineering Village

477. Research on robot binocular ranging based on SIFT feature extraction algorithm (*Open Access*)

Accession number: 20203709173283
Authors: Haifeng, Dong (1); Jun, Yao (1)
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Corresponding author: Haifeng, Dong(1324384654@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
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Issue date: August 17, 2020
Publication year: 2020
Article number: 012015
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 International Symposium on Electronic Information Technology and Communication Engineering, ISEITCE 2020
Conference date: June 19, 2020 - June 21, 2020
Conference location: Jinan, China
Conference code: 162447
Publisher: Institute of Physics Publishing
Abstract: Binocular stereo vision belongs to the reconstruction technology of images. It has the characteristics of non-contact measurement and easy implementation. It has broad application prospects in many fields. The study of its basic theory also has great theoretical and practical significance. As part of stereo vision, robot binocular distance measurement has an irreplaceable role. In this paper, a complete binocular ranging system is divided into the following five steps: principle analysis, camera calibration, image preprocessing, SIFT feature point extraction, distance measurement, a simple model in robot binocular ranging is realized, which is a robot Route planning and obstacle avoidance provide data support, which has the advantages of easy operation and simple calculation. © Published under licence by IOP Publishing Ltd.
Number of references: 6
Main heading: Stereo image processing
Controlled terms: Extraction - Binoculars - Robot programming - Stereo vision - Binocular vision
Uncontrolled terms: Binocular ranging - Binocular stereo vision - Broad application - Camera calibration - Image preprocessing - Noncontact measurements - Principle analysis - Robot route planning

Classification code: 723.1 Computer Programming - 723.2 Data Processing and Image Processing - 723.5 Computer Applications - 731.5 Robotics - 741.2 Vision - 741.3 Optical Devices and Systems - 802.3 Chemical Operations
DOI: 10.1088/1742-6596/1607/1/012015
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
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478. A four-parameter calculation method of oil-based mud electric imaging logging based on concave electrode pairs in low-resistivity formation

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Title of translation:
Authors: Gao, Jianshen (1); Song, Yang (1); Liu, Yanping (1); Zhu, Kairan (1); Liu, Xin (1)
Author affiliation: (1) School of Electronic Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Gao, Jianshen(gjs1109@126.com)
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Issue date: August 1, 2020
Publication year: 2020
Pages: 960-968
Language: Chinese
ISSN: 02532697
CODEN: SYHPD9
Document type: Journal article (JA)
Publisher: Science Press
Abstract: Oil-based mud (OBM) electric imaging logging is one of the research hotspots in the field of logging. Aiming at the problems of electric imaging logging in the OBM environment, this paper proposes a four-parameter calculation method of OBM electric imaging logging based on concave electrode pairs in low-resistivity formation. The four parameters include formation resistivity, mud cake thickness, OBM resistivity and OBM permittivity. Based on the electrode structure, working principle and the four-parameter calculation method of the concave electrode pairs, this paper analyzes the influencing factors of above four parameters, draws a correction chart for OBM resistivity and OBM relative permittivity, and verifies the accuracy of the calculation method using random data and a layered formation model. The results show that mud cake thickness is a key parameter to calculate the four parameters of OBM electric imaging logging. The calculation steps are as follows: (1) mud cake thickness is first calculated, and then the electrode coefficient and formation resistivity is determined and calculated, respectively; (2) according to the current frequency, formation resistivity, mud cake thickness and other parameters, the numerical calculation results of OBM resistivity and OBM relative permittivity are corrected. Under low-resistivity formation conditions, measurements and calculations based on concave electrode pairs can accurately reflect changes in OBM resistivity, OBM relative permittivity, formation resistivity, and mud cake thickness, providing favorable support for the instrument design and data processing of OBM electric imaging logging. © 2020, Editorial Office of ACTA PETROLEI SINICA. All right reserved.
Number of references: 22
Main heading: Permittivity
Controlled terms: Data handling - Electrodes - Oil well logging
Uncontrolled terms: Electrode coefficient - Electrode structure - Formation condition - Formation resistivity - Layered formations - Numerical calculation - Parameter calculation - Relative permittivity
Classification code: 512.1.2 Petroleum Deposits : Development Operations - 723.2 Data Processing and Image Processing
DOI: 10.7623/syxb202008005
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

479. Study in the big data talent training oriented reform of information management and information system major under the management category (*Open Access*)

Accession number: 20203709174416
Authors: Hou, Ke (1); Guo, Mingcheng (1); Li, Xinhao (1)
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Document type: Conference article (CA)
Conference name: 2020 3rd International Symposium on Big Data and Applied Statistics, ISBDAS 2020
Conference date: July 10, 2020 - July 12, 2020
Conference location: Kunming, China
Conference code: 162486
Publisher: Institute of Physics Publishing
Abstract: With the coming Big Data era, the curriculum system of the Information Management and Information System (IMIS for short) Major under the Management Category cannot meet the needs of modern society for talents. Many universities have taken many measures to deal with this situation, which means creating the Big Data Major among current majors or directly replacing the IMIS Major under the Management Category under the Management Category with the Big Data Major. In this paper, the overview of IMIS Major under the Management Category is introduced firstly, and then its problems in the Big Data era are analyzed. By referencing to relevant research results, the current situation and trend of IMIS Major under the Management Category reform under the Management Category is studied. Finally, our solution is put forwarded. © Published under licence by IOP Publishing Ltd.
Number of references: 5
Main heading: Information management
Controlled terms: Management information systems - Big data - Information use - Information systems
Uncontrolled terms: Current situation - Curriculum systems - Research results - Talent trainings
Classification code: 723.2 Data Processing and Image Processing - 903.2 Information Dissemination - 903.3 Information Retrieval and Use
DOI: 10.1088/1742-6596/1616/1/012025
Funding Details: Number: 201810705044, Acronym: -, Sponsor: National College Students Innovation and Entrepreneurship Training Program;
Funding text: This research was supported by the National Innovation and Entrepreneurship Training Program of China for Undergraduate (Project Number: 201810705044) and the Teaching Project for School of Economics and Management of Xi'an Shiyou University (Project Name: Research on Comprehensive Teaching Mode of "Database Course Group" for Economic and Management Majors).
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

480. Research on condition prediction of rod pumping system based on grey prediction model

Accession number: 20201708506407
Authors: Song, Hong (1); Gao, Wangxiong (1); Ren, Tao (1)
Author affiliation: (1) College of Mechanical Engineering, Xi'An Shiyou University, Xi'an, Shaanxi; 710065, China
Corresponding author: Song, Hong(sh_songhong@sina.com)
Source title: Proceedings - 2020 12th International Conference on Measuring Technology and Mechatronics Automation, ICMTMA 2020
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Conference location: Phuket, Thailand
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Sponsor: Communication Research Institute of Changsha University of Science and Technology; Department of Urban Management, Hunan City University; Hongkong Intelligent Computation Technology and Automation Association
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: This paper aims to effectively monitor the complex working conditions that may occur at any time during the downhole operation of the rod-pumping system, and perform the targeted processing in advance. A grey prediction model is established based on the characteristic values of the pump dynamograph to predict the working conditions. In this prediction method, we will use the characteristic values of the pump dynamograph extracted by Freeman chain code as a parameter, and use the gray theory to establish a grey prediction model. The prediction model is used to predict the sample parameters in the time series to obtain the characteristic values for a period of time in the future and the prediction of future conditions to be realized. The results show that the prediction model has a high degree of fitting, and has a good effect on the prediction of the conditions of the rod pumping system. © 2020 IEEE.
Number of references: 10
Main heading: Pumps
Controlled terms: Pumping plants - Forecasting
Uncontrolled terms: Characteristic value - Condition prediction - Degree of fitting - Downhole operation - Freeman chain code - Grey prediction model - Prediction methods - Rod pumping systems
Classification code: 446 Waterworks - 618.2 Pumps
DOI: 10.1109/ICMTMA50254.2020.00165
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

481. Application of Hybrid Intelligent Algorithms in Path Planning (*Open Access*)

Accession number: 20201708510682
Authors: Cuan, Ying (1); Li, Yike (1); Li, Xiangjuan (1)
Author affiliation: (1) School of Computer Science, Xi'An Shiyou University xi'An, Shannxi; 710065, China
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1487
Part number: 1 of 1
Issue: 1
Issue title: 2020 4th International Conference on Control Engineering and Artificial Intelligence, CCEAI 2020
Issue date: April 8, 2020
Publication year: 2020
Article number: 012004
Language: English
ISSN: 17426588
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Document type: Conference article (CA)
Conference name: 2020 4th International Conference on Control Engineering and Artificial Intelligence, CCEAI 2020
Conference date: January 17, 2020 - January 19, 2020
Conference location: Singapore, Singapore
Conference code: 159002
Sponsor: Fudan University

Publisher: IOP Publishing Ltd
Abstract: Combining with the classical combinatorial optimization problem in the field of mathematics, this paper decides to take the optimal path planning problem as the research object. A new neighborhood search operator is introduced into the basic worker bee colony algorithm, and the optimization strategy of the algorithm is updated by combining the simulated annealing algorithm. Finally, the improved algorithm is applied to the optimal layout of the path planning, and the optimization results are compared with those of other algorithms. The simulation test shows that the intelligent optimization scheme proposed in this paper can get better optimization results, and has certain feasibility in the path planning. It provides valuable reference for solving the classical problems of the same type. © 2020 IOP Publishing Ltd. All rights reserved.
Number of references: 14
Main heading: Motion planning
Controlled terms: Simulated annealing - Combinatorial optimization
Uncontrolled terms: Bee colony algorithms - Combinatorial optimization problems - Hybrid intelligent algorithms - Intelligent optimization - Neighborhood search - Optimal path planning - Optimization strategy - Simulated annealing algorithms
Classification code: 537.1 Heat Treatment Processes - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory - 921.5 Optimization Techniques
DOI: 10.1088/1742-6596/1487/1/012004
Funding Details: Number: 2019KW-045, Acronym: -, Sponsor: -; Number: 41301480, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported by the Key Research Development Program of Shaanxi Province (2019KW-045), The National Natural Science Foundation of China (41301480)
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

482. Separation of close-boiling 2,4-/2,5-xylenol isomers from coal tar

Accession number: 20202508842405
Authors: Ke, Cong-Yu (1); Wei, Ying-Lin (1); Lu, Guo-Min (1); Zhang, Xiao-Xia (1); Sun, Wu-Juan (1); Tang, Xuan (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: 15
Issue: 6
Issue date: November/December 2020
Publication year: 2020
Article number: e2530
Language: English
ISSN: 19322135
E-ISSN: 19322143
Document type: Journal article (JA)
Publisher: John Wiley and Sons Ltd
Abstract: It is challenging to separate 2,4-/2,5-xylenol isomers with very close boiling points. In the present work, a multistep process for the separation of 2,4-/2,5-xylenol isomers from coal tar was investigated, involving alkylation, distillation, and dealkylation. Starting from the selection of suitable catalyst, the operating conditions for alkylation, distillation, and dealkylation were optimized by varying key parameters systematically. Among the four catalysts examined, p-toluenesulfonic acid (PTSA) showed best performance in terms of conversion and selectivity. Under the optimized alkylation conditions, the yields of 6-tert-butyl-2,4-xylenol and 4-tert-butyl-2,5-xylenol were 97.3% and 86.2%, respectively. Following pH adjusted to 7–8 with 10% sodium carbonate and water washing, the minimum reflux ratios during distillation for obtaining 6-tert-butyl-2,4-xylenol and 4-tert-butyl-2,5-xylenol were 4 and 12, with product purity of 99.8% and 99.5%, respectively. Under the optimized dealkylation conditions, both yields of 2,4-xylenol and 2,5-xylenol reached 99.9%. After recrystallization, the final product purity was over 99.5%. This lab-scale investigation provides key information for an on-going pilot-scale process design. © 2020 Curtin University and John Wiley & Sons, Ltd.
Number of references: 36
Main heading: Distillation
Controlled terms: Coal tar - Alkylation - Isomers - Sodium Carbonate - Catalyst selectivity

Uncontrolled terms: Close-boiling - Lab-scale investigations - Minimum refluxes - Multistep process - Operating condition - p-Toluene sulfonic acids - Product purity - Water washing
Classification code: 411.2 Coal Tar - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.2 Inorganic Compounds
Numerical data indexing: Percentage 1.00e+01%, Percentage 8.62e+01%, Percentage 9.73e+01%, Percentage 9.95e+01%, Percentage 9.98e+01%, Percentage 9.99e+01%
DOI: 10.1002/apj.2530
Funding Details: Number: 17JF033, Acronym: -, Sponsor: -; Number: YJSYZX19SKF0004, Acronym: -, Sponsor: -; Number: YCS19211015,YCS19211018, Acronym: -, Sponsor: -; Number: 2018ZDXM#GY#159, Acronym: -, Sponsor: Shanxi Provincial Key Research and Development Project;
Funding text: This work was supported by the Key Research and Development Program of Shaanxi Province (2018ZDXMGY159), Open Project of Shaanxi Key Laboratory of Lacustrine Shale Gas Accumulation and Exploitation (YJSYZX19SKF0004), Postgraduate Innovation and Practical Ability Training Plan of Xi'an Shiyou University (YCS19211015 & YCS19211018), and Collaborative Innovation Center for Unconventional Oil and Gas Exploration and Development (17JF033).This work was supported by the Key Research and Development Program of Shaanxi Province (2018ZDXM-GY-159), Open Project of Shaanxi Key Laboratory of Lacustrine Shale Gas Accumulation and Exploitation (YJSYZX19SKF0004), Postgraduate Innovation and Practical Ability Training Plan of Xi'an Shiyou University (YCS19211015 & YCS19211018), and Collaborative Innovation Center for Unconventional Oil and Gas Exploration and Development (17JF033).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

483. Near-source hydrocarbon accumulation: geochemical evidence of lacustrine crude oil from the Member 6 of Yanchang Formation, eastern margin of Ordos Basin

Accession number: 20210309792537
Title of translation: -""6
Authors: Zhao, Jingzhou (1, 2); Meng, Xuangang (3); Han, Zaihua (1, 2)
Author affiliation: (1) School of Earth Sciences and Engineering, Xi'an Shiyou University, Xi'an; 710065, China; (2) Shaanxi Key Lab of Petroleum Accumulation Geology, Xi'an Shiyou University, Xi'an; 710065, China; (3) Yanchang Oil Field Co., Ltd., Yan'an; 716000, China
Corresponding author: Zhao, Jingzhou(jzzhao@xsyu.edu.cn)
Source title: Shiyou Xuebao/Acta Petrolei Sinica
Abbreviated source title: Shiyou Xuebao
Volume: 41
Issue: 12
Issue date: December 2020
Publication year: 2020
Pages: 1513-1526
Language: Chinese
ISSN: 02532697
CODEN: SYHPD9
Document type: Journal article (JA)
Publisher: Science Press
Abstract: The northeastern part of Ordos Basin in the east and north of Yan'an was once considered to be located in the "margin" of the Member 7 of Triassic Yanchang Formation ancient lacustrine basin. Some scholars believe that the source rocks in Yanchang Formation are not developed in this area, where the oil is generated in the center of lacustrine basin and then migrated laterally from there over long distances; however, some studies have suggested that the tight oil reservoirs in the entire Ordos Basin, including the edge of the basin, are all formed by near-source accumulation. To clarify the source of oil from Yanchang Formation in the eastern part of the basin, a study is performed on the geochemistry of crude oil and oil-source correlation in the main reservoir Member 6 of Yanchang Formation of the Qilicun oilfield in the "eastern margin" of the Triassic Lacustrine basin. The Member 6 of Yanchang Formation crude oil in the Qilicun oilfield is characterized by high saturated hydrocarbon content, high saturated hydrocarbon/aromatic hydrocarbon ratio, low non-hydrocarbon and asphaltene contents. The n-alkanes show the front high unimodal type, with the main peak carbon of C19. The analysis of biomarkers shows that the Member 6 of Yanchang Formation crude oil is cognate mature oil. The kerogen is mainly composed of low-grade aquatic organisms such as algae, mixed with terrestrial higher plants, and the sedimentation environment of kerogen is a partially reducing freshwater lake. The Member 6 of Yanchang Formation crude oil shows an obviously genetic relationship with

the black shale and dark mudstone of Member 7 of Yanchang Formation in Qilicun oilfield, but is quite different from the Member 7 of Yanchang Formation source rocks in the central lacustrine basin zones such as Zhidan and Fuxian area in the characteristics of group composition, biomarker and stable carbon isotope. The comprehensive analysis suggests that the Member 6 of Yanchang Formation crude oil in the Qilicun oilfield is not that migrating over long distances from the high-quality source rocks of Member 7 of Yanchang Formation in the center of the lacustrine basin; it is mainly generated from the Member 7 of Yanchang Formation source rocks in the area. After vertical migration and lateral migration over short distances, it accumulates in the Member 6 of Yanchang Formation and other reservoirs, formed by near-source accumulation.
Number of references: 44
Main heading: Crude oil
Controlled terms: Aquatic organisms - Petroleum prospecting - Petroleum reservoirs - Oil fields - Biomarkers - Carbon - Kerogen - Oil shale - Petroleum reservoir engineering - Metamorphic rocks - Paraffins
Uncontrolled terms: Comprehensive analysis - Genetic relationships - Geochemical evidence - High-quality source rocks - Hydrocarbon accumulation - Oil-source correlation - Saturated hydrocarbons - Stable carbon isotopes
Classification code: 471 Marine Science and Oceanography - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 804 Chemical Products Generally - 804.1 Organic Compounds
DOI: 10.7623/syxb202012006
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

484. Paper spray mass spectrometry for discriminating the quality of commercial gasolines

Accession number: 20201708510339
Authors: Zhao, Jia (1); Zheng, Yajun (1); Zhang, Zhiping (1)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Zhang, Zhiping(zhangzp0304@gmail.com)
Source title: Analytical Methods
Abbreviated source title: Anal. Methods
Volume: 12
Issue: 14
Issue date: April 14, 2020
Publication year: 2020
Pages: 1926-1934
Language: English
ISSN: 17599660
E-ISSN: 17599679
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Paper spray ionization mass spectrometry (PSI-MS) is a powerful technique for the direct analysis of complex samples with high performance but with highly simplified procedures. Herein PSI-MS has been optimized for the discrimination of commercial gasoline quality. For the purpose of increasing the ionization efficiency of gasoline samples, various solvents (e.g., methanol, ethanol, acetonitrile and isopropanol) were mixed with gasoline prior to PSI-MS analysis. The results demonstrated that a high polarity of applied solvent would lead to more information of gasoline samples in generated mass spectra, and 70% (v/v) of gasoline in gasoline/methanol admixtures gave the optimal condition. The optimized PSI-MS was then applied to discriminate commercial gasoline samples from different gas stations of four refining companies. It was found that there was much difference in the gasoline samples from different companies, and even for those from the same refining company but from different gas stations. Further studies of the fingerprinting of gasoline samples indicated that the components of gasoline samples from different gas stations but from one refining company varied significantly, suggesting that no comparable standards were implemented in the refining process of gasolines. Also, PSI-MS was applied to discriminate gasoline adulterated with diesel, and as low as 1% of diesel in gasoline could be detected. These results illustrate that PSI-MS is an alternative and sensitive methodology for rapid evaluation of gasoline quality.
Number of references: 55
Main heading: Gasoline
Controlled terms: Refining - Quality control - Gases - Ionization of gases - Mass spectrometry - Organic solvents
Uncontrolled terms: Commercial gasolines - Gasoline quality - Gasoline samples - Ionization efficiency - Optimal conditions - Refining process - Simplified procedure - Spray ionization

Classification code: 523 Liquid Fuels - 801 Chemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 913.3 Quality Assurance and Control
Numerical data indexing: Percentage 1.00e+00%
DOI: 10.1039/d0ay00492h
Funding Details: Number: -, Acronym: XSYU, Sponsor: Xi'an Shiyou University; Number: 2019JC-33, Acronym: -, Sponsor: -; Number: 21777128, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: We are grateful for funding from the National Natural Science Foundation of China (no. 21705125 and 21777128), Natural Science Basic Research Program of Shaanxi Province of China (grant no. 2019JC-33) and Postgraduate Research & Practice Innovation Program of Xi'an Shiyou University (no. YCS19111012).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

485. Deformation Mechanism of Thin and Medium-Thickness Cylinder and Its Collapse Strength under Bending (*Open Access*)

Accession number: 20202908940179
Authors: Cao, Lihu (1); Dou, Yihua (2); Liu, Junyan (1); Li, Mingfei (2); Zhang, Wei (1)
Author affiliation: (1) Tarim Oilfield Company, Petrochina, Korla, China; (2) Xi'An Shiyou University, Shaanxi, Xi'an, China
Corresponding author: Dou, Yihua(yhdou@vip.sina.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1549
Part number: 3 of 5
Issue: 3
Issue title: 2020 International Conference on Environment Science and Advanced Energy Technologies, ESAET 2020 - 2. Applied Materials
Issue date: June 29, 2020
Publication year: 2020
Article number: 032133
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 International Conference on Environment Science and Advanced Energy Technologies, ESAET 2020
Conference date: January 18, 2020 - January 19, 2020
Conference location: Chongqing, China
Conference code: 161554
Publisher: Institute of Physics Publishing
Abstract: Considering the influence of flattening of casing cross-section on collapse, the stress equivalence principle was applied to conclude the triaxial stress and collapse strength. The method to determine casing collapse strength considering flattening of casing cross-section was established. The diameter-to-thickness ratio had a major influence on the flattening of the casing cross-section compared with curvature. For the 5 1/2"×7.72mm P110 casing, the flattening coursed by the 0.01/m curvature decreased the collapse strength concluded by API 5C3 by approximately 7.5%. © Published under licence by IOP Publishing Ltd.
Number of references: 23
Main heading: Bending strength
Uncontrolled terms: Collapse strength - Deformation mechanism - Diameter-to-thickness ratios - Equivalence principles - Tri-axial stress
Numerical data indexing: Percentage 7.50e+00%
DOI: 10.1088/1742-6596/1549/3/032133
Funding Details: Number: 2016ZX05051, Acronym: -, Sponsor: National Major Science and Technology Projects of China;
Funding text: This work was financially supported by Major national science and technology projects (No.2016ZX05051) fund.
Compendex references: YES
Open Access type(s): All Open Access, Bronze

Database: Compendex
Data Provider: Engineering Village

486. Effect of final carbonization temperature on catalytic performance of β–Mo2C in quinoline hydrodenitrogenation

Accession number: 20202108684480
Title of translation: β–Mo2C
Authors: Qiu, Ze-Gang (1); Li, Qiao (1); Ma, Shao-Bo (1); Li, Zhi-Qin (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Li, Zhi-Qin(lizhiqin@xsyu.edu.cn)
Source title: Ranliao Huaxue Xuebao/Journal of Fuel Chemistry and Technology
Abbreviated source title: Ranliao Huaxue Xuebao J. Fuel Chem. Technol.
Volume: 48
Issue: 3
Issue date: March 1, 2020
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Pages: 357-368
Language: Chinese
ISSN: 2097213X
E-ISSN: 18725813
CODEN: RHXUD8
Document type: Journal article (JA)
Publisher: Science Press
Abstract: MoO3 was used as precursor, CH4/H2 as carbon source, and a direct reduction carbonization method with programmed temperature rise was used to prepare molybdenum carbide catalysts at different final carbonization temperatures (640, 660, 680, 700, and 720). The physical properties and structural properties of molybdenum carbide were characterized by XRD, N2 adsorption, SEM, TEM, XPS and Raman. The effect of final carbonization temperature on the catalytic performance of molybdenum carbide in quinoline hydrodenitrogenation was studied. The results showed that the molybdenum carbide catalysts with different final carbonization temperatures were all existed in the phase of β–Mo2C. The final carbonization temperature could significantly change content of species on the surface, average pore size, and mesopore distribution of molybdenum carbide. When the final carbonization temperature was 680, a higher carbonization degree, the lowest content of oxygen species on the surface and the highest surface C/Mo molar ratio of catalyst were obtained; accordingly, the best catalytic activity of catalysts was achieved. At 340 and 4 MPa, the conversion and denitrification rate of quinoline were up to 99%, while the selectivity of aromatic compounds was up to 37.8%, showing a lower aromatic ring destruction. Surface composition, especially surface oxygen, was essential for the regulation of the quinoline hydrodenitrogenation reaction pathway on β–Mo2C.
Number of references: 28
Main heading: Molybdenum oxide
Controlled terms: Aromatic compounds - Carbides - Carbonization - Catalyst activity - Molar ratio - Oxygen - Pore size
Uncontrolled terms: Carbon A - Carbon source - Carbonization temperatures - Catalytic performance - CH 4 - Direct Reduction - Hydrodenitrification - Quinoline -]+ catalyst - B–mo2C
Classification code: 801.4 Physical Chemistry - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 812.1 Ceramics - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
Numerical data indexing: Percentage 3.78E+01%, Percentage 9.90E+01%, Pressure 4.00E+06Pa
Funding Details: Number: 2019JM#085,21606177,21878243, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The project was supported by the National Natural Science Foundation of China (21878243, 21606177) and Shanxi Natural Science Basic Research Program (2019JM-085). The project was supported by the National Natural Science Foundation of China (21878243, 21606177) Program (2019JM085). (21878243, 21606177) (2019JM085)
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

487. An Unsteady Model for Flow Distribution of Solar Tower Receiver Under Variable Load Conditions

Accession number: 20202108678400
Title of translation:
Authors: Liu, Jialun (1); Hao, Yun (1); Weng, Yu (1)
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi Province; 710065, China
Source title: Zhongguo Dianji Gongcheng Xuebao/Proceedings of the Chinese Society of Electrical Engineering
Abbreviated source title: Zhongguo Dianji Gongcheng Xuebao
Volume: 40
Issue: 8
Issue date: April 20, 2020
Publication year: 2020
Pages: 2606-2617
Language: Chinese
ISSN: 02588013
CODEN: ZDGXER
Document type: Journal article (JA)
Publisher: Chinese Society for Electrical Engineering
Abstract: Aimed at the uneven flow distribution occurred in the solar tower receiver under variable load conditions, a calculation model suitable for the unsteady flow distribution of the parallel pipe system was established. On one hand, the variation of fluid parameters in the receiver with time under variable load conditions such as the weather change and the alternation of day with night was considered by introducing a time term into the discrete control equations. On the other hand, the effects of both the solar heat flux distribution and the manifold-pipes structure on flow distribution were simultaneously taken into account by the meshing of the whole flow domain including the manifolds and the branch pipes, as well as the coupling solution between the manifolds and branch pipes. The present model was then verified by the experimental data in the open literature. By using the present model, the effect of non-uniform heat load distribution on the steady flow distribution characteristics of solar receiver was studied. Then the dynamic variation characteristics of mass flow distribution in parallel pipes with step increase of boundary conditions such as inlet fluid pressure, inlet fluid temperature and solar heat flux were simulated. It was found that the flow distribution always tends to deteriorate sharply during the unsteady process, which brings great safety hazard to the operation of the solar receiver. © 2020 Chin. Soc. for Elec. Eng.
Number of references: 22
Main heading: Heat flux
Controlled terms: Parallel flow - Passive solar - Solar heating
Uncontrolled terms: Calculation models - Coupling solution - Dynamic variations - Flow distribution - Fluid temperatures - Heat flux distributions - Heat load distributions - Unsteady modeling
Classification code: 631.1 Fluid Flow, General - 641.2 Heat Transfer - 657.1 Solar Energy and Phenomena
DOI: 10.13334/j.0258-8013.pcsee.191120
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

488. Airborne high-resolution image motion target detection combined with hyperspectral features (*Open Access*)

Accession number: 20202508834815
Authors: Wang, Cailing (1); Zhang, Yuchun (1); Guo, Pu (1); Xu, Jun (2)
Author affiliation: (1) Xi'an Shiyou University, Xi'an; 710065, China; (2) Xi'an Aeronautical University, Xi'an; 710089, China
Corresponding author: Wang, Cailing(1018451102@qq.com)
Source title: Journal of Physics: Conference Series
Abbreviated source title: J. Phys. Conf. Ser.
Volume: 1544
Part number: 1 of 1
Issue: 1
Issue title: 2020 5th International Conference on Intelligent Computing and Signal Processing, ICSP 2020
Issue date: June 2, 2020
Publication year: 2020

Article number: 012100
Language: English
ISSN: 17426588
E-ISSN: 17426596
Document type: Conference article (CA)
Conference name: 2020 5th International Conference on Intelligent Computing and Signal Processing, ICSP 2020
Conference date: March 20, 2020 - March 22, 2020
Conference location: Suzhou, China
Conference code: 160646
Publisher: IOP Publishing Ltd
Abstract: Aiming at moving object detection in Airborne Hyperspectral Remote Sensing Images under complex background, this paper proposes a background removal method based on Mixture Gauss Model. Firstly, in order to eliminate the influence of the dithering of airborne platform on remote sensing image, this paper uses affine transform-based image registration algorithm to achieve the image registration of 3D data. Then, this paper selects specific spectral images, establishes the Mixture Gauss background model, and subtracts the background to achieve the extraction of moving objects. The experimental results show that the method can extract moving objects in Airborne Hyperspectral Remote Sensing Images effectively.
Number of references: 13
Main heading: Image registration
Controlled terms: Mixtures - Object recognition - Spectroscopy - Object detection - Target tracking - Motion analysis - Affine transforms - Remote sensing
Uncontrolled terms: Airborne hyperspectral remote sensing - Airborne platforms - Background removal - Complex background - High resolution image - Image registration algorithm - Moving-object detection - Remote sensing images
Classification code: 723.2 Data Processing and Image Processing - 921.3 Mathematical Transformations
DOI: 10.1088/1742-6596/1544/1/012100
Compendex references: YES
Open Access type(s): All Open Access, Bronze
Database: Compendex
Data Provider: Engineering Village

489. Development of online examination management system for rig operation process

Accession number: 20205109638828
Authors: Sha, Linxiu (1); Wang, Weize (1)
Author affiliation: (1) Shaanxi Key Laboratory of Drilling Rig Control, Xi'An Shiyou University, Xi'an, China
Source title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Abbreviated source title: Proc. - Int. Conf. Comput. Netw., Electron. Autom., ICCNEA
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
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Language: English
ISBN-13: 9781728170831
Document type: Conference article (CA)
Conference name: 3rd International Conference on Computer Network, Electronic and Automation, ICCNEA 2020
Conference date: September 25, 2020 - September 27, 2020
Conference location: Xi'an, China
Conference code: 164894
Sponsor: State and Provincial Joint Engineering Lab. of Advanced Network, Monitoring and Controls; Xian Technological University
Publisher: Institute of Electrical and Electronics Engineers Inc.
Abstract: In order to complete the closed-loop purpose of optimizing the virtual experiment platform for remote interactive control of drilling rigs from teaching, practice to assessment, on the premise of analyzing the inadequacy of the existing assessment methods, an online examination management system aimed at the operation process of drilling rigs was designed. The system uses MySQL, PHP, Ajax, etc. to achieve the functions of creating test papers,

deleting test papers, updating test papers, examinations for the operation process of the rig, automatic examination papers, and feedback. By establishing a reasonable examination mechanism, the system can effectively reduce the risk and accident rate of the actual operation of the drilling rig, and can also provide data for the improvement of the experimental platform, and improve the quality control of the platform teaching. © 2020 IEEE.
Number of references: 13
Main heading: Quality control
Controlled terms: E-learning - Drilling rigs - Paper - Infill drilling
Uncontrolled terms: Actual operation - Experimental platform - Interactive control - Management systems - On-line examinations - Operation process - Rig operations - Virtual experiments
Classification code: 511.1 Oil Field Production Operations - 511.2 Oil Field Equipment - 811.1 Pulp and Paper - 913.3 Quality Assurance and Control
DOI: 10.1109/ICCNEA50255.2020.00087
Funding Details: Number: 18JS095,290088112,331890049, Acronym: -, Sponsor: -; Number: 2020GY-046, Acronym: -, Sponsor: -;
Funding text: ACKNOWLEDGMENT The project is funded by the key R&D project of Shaanxi Province in Shaanxi Province, the development of a virtual simulation platform for remote interactive optimization control of oil and gas rigs (2020GY-046)? the research project of the Key Laboratory of Shaanxi Provincial Department of Education: Multi-objective interactive optimization study of complex borehole trajectory while drilling (18JS095) ?school-level 2019 virtual simulation experiment teaching project: virtual simulation experiment of remote interactive optimization control of virtual oil and gas rigs (331890049) ?school-level youth innovation project: dynamic control of drilling process based on stochastic reservoir modeling (290088112) and the Graduate Innovation and Practical Ability Training Program of Xi'an Shiyou University.The project is funded by the key R&D project of Shaanxi Province in Shaanxi Province, the development of a virtual simulation platform for remote interactive optimization control of oil and gas rigs (2020GY-046) the research project of the Key Laboratory of Shaanxi Provincial Department of Education: Multi-objective interactive optimization study of complex borehole trajectory while drilling (18JS095)school-level 2019 virtual simulation experiment teaching project: virtual simulation experiment of remote interactive optimization control of virtual oil and gas rigs (331890049) school-level youth innovation project: dynamic control of drilling process based on stochastic reservoir modeling (290088112) and the Graduate Innovation and Practical Ability Training Program of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

490. Conversion of 4-ethylphenol to light aromatics on the Cr2O3/Al2O3 modified by phosphoric acid

Accession number: 20204009259107
Title of translation: Cr2O3/Al2O34-
Authors: Qiu, Ze-Gang (1); Liu, Wei-Wei (1); Li, Zhi-Qin (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Li, Zhi-Qin(lizhiqin@xsyu.edu.cn)
Source title: Ranliao Huaxue Xuebao/Journal of Fuel Chemistry and Technology
Abbreviated source title: Ranliao Huaxue Xuebao J. Fuel Chem. Technol.
Volume: 48
Issue: 8
Issue date: August 1, 2020
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Pages: 993-1003
Language: Chinese
ISSN: 2097213X
E-ISSN: 18725813
CODEN: RHXUD8
Document type: Journal article (JA)
Publisher: Science Press
Abstract: With the goal of conversion of alkylphenols to light aromatics (benzene and toluene), Cr2O3/Al2O3 catalysts were prepared and their hydrogenation performance was investigated using 4-ethylphenol as a model compound. With the increase of LHSV, H2/oil, reaction pressure and temperature, the dealkylation rate, the total selectivity of aromatics, and the selectivity of light aromatics first rose and then dropped. The conversion of 4-ethylphenol was obviously influenced by the reaction temperature. Cr2O3/Al2O3 was modified with different concentrations of

phosphoric acid. As the increase of the amount of phosphoric acid, the general amount of weak and medium acids on the catalyst increased, and the strength of acid was first enhanced and then weakened. The amount of weak acid increased significantly under a high value of the amount of phosphoric acid. Compared with the unmodified catalyst, the conversion of 4-ethylphenol on the catalysts modified by 8% phosphoric acid is higher than 99.5%, while the dealkylation rate of 4-ethylphenol increased by 9.4%, reaching to 74.4%, and the selectivity to light aromatics (benzene and toluene) increased by 4.0%, reaching to 57.0%. Conversion of 4-ethylphenol to light aromatics was achieved in high selectivity. Furthermore, the total selectivity of aromatics was as high as 80.4%, which meant that most of the aromatic rings was not broken. The path of hydrogenation reaction of 4-ethylphenol on Cr2O3/Al2O3 was proposed and the reaction mechanism was discussed.
Number of references: 38
Main heading: Alumina
Controlled terms: Aluminum oxide - Aromatization - Benzene - Catalyst selectivity - Chromium compounds - Coal tar - Hydrogenation - Toluene
Uncontrolled terms: 4-ethylphenol - Alkylphenols - Aromatic benzene - Benzene and Toluene - Dealkylation - Model compound - Performance - Reaction temperature - Total selectivity -]+ catalyst
Classification code: 411.2 Coal Tar - 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 4.00E+00%, Percentage 5.70E+01%, Percentage 7.44E+01%, Percentage 8.00E+00%, Percentage 8.04E+01%, Percentage 9.40E+00%, Percentage 9.95E+01%
Funding Details: Number: 2019JM#085, Acronym: -, Sponsor: -; Number: 21606177,21878243,21908176, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: The project was supported by the Natural Science Foundation of China (21878243, 21606177, 21908176) and Natural Science Basic Research Program of Shaanxi (2019JM085). (21878243, 21606177, 21908176) (2019JM085)
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

491. Quantum Chemical Studies on Frontier Molecular Orbitals and Theoretical Vibration Spectra of L-arginine Phosphate Monohydrate

Accession number: 20201308337684
Title of translation: L-
Authors: Wang, Lei (1)
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Corresponding author: Wang, Lei(leiw@xsyu.edu.cn)
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Abbreviated source title: Cailiao Daobao/Mater. Rep.
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Issue date: February 25, 2020
Publication year: 2020
Pages: 04174-04178
Language: Chinese
ISSN: 1005023X
Document type: Journal article (JA)
Publisher: Cailiao Daobaoshe/ Materials Review
Abstract: L-arginine phosphate monohydrate (LAP) crystal is a kind of semi-organic material with excellent nonlinear optical properties, which attracts much attention due to its special high laser damage threshold. Based on the successive discovery of its uniqueness and the interaction between guanidine and phosphate groups in LAP, it is a novel and reasonable way to explore the molecular specificity and the mechanism of crystal laser damage by studying the interaction between intramolecular groups. In this work, four related molecular models were established based on the group composition of LAP molecular. The structural optimization, theoretical vibrational spectra and the frontier molecular orbital analysis of four molecule models were investigated using M06-2X-D3/6-311++g(d,p) in Gaussian 16. The results show that there is a strong binding energy between L-arginine cation and phosphate anion in LAP, and the interaction between phosphate and guanidine in LAP could weaken the conformational flexibility of L-arginine molecular and distort the phosphorus-oxygen tetrahedron. Compared with water molecular, phosphate group can significantly reduce the molecular orbital energy gap of LAP, which is conducive to the intramolecular electron transfer. In addition, there are various electronic interactions between phosphate group with all groups of L-arginine molecular.

The phosphate group have the electron-pushing effect on the N-H bond of amino group and guanidine group, and there is a stronger and more obvious interaction between phosphate and guanidine groups. Moreover, it also shows an electron-pulling effect on the carboxyl group. The study can established a good theoretical foundation for further understanding and studying the interaction between phosphate and guanidine groups.
Number of references: 22
Main heading: Optical properties
Controlled terms: Aromatic compounds - Organic lasers - Nonlinear optics - Arginine - Binding energy - Optical materials - Positive ions - Structural optimization - Laser damage
Uncontrolled terms: Conformational flexibility - Frontier molecular orbitals - Intergroup interaction - Intra-molecular electron transfer - L-arginine phosphate - Molecular orbital energy - Non-linear optical properties - Quantum chemical calculations
Classification code: 741.1 Light/Optics - 741.1.1 Nonlinear Optics - 741.3 Optical Devices and Systems - 744.1 Lasers, General - 744.8 Laser Beam Interactions - 801.4 Physical Chemistry - 804.1 Organic Compounds - 921.5 Optimization Techniques
DOI: 10.11896/cldb.19020022
Funding Details: Number: -, Acronym: IUSS, Sponsor: National Outstanding Youth Science Fund Project of National Natural Science Foundation of China; Number: ys37020203, Acronym: -, Sponsor: -;
Funding text: (Supplementary Information) :(51702257);(2018JQ5123); (ys37020203) This work was financially supported by the National Natural Science Foundation Youth Fund of China (51702257), Natural Science Basic Research Plan in Shaanxi Province of China (2018JQ5123), Provincial Superiority Discipline of Materials Science and Engineering of Xian Shiyou University (ys37020203). leiw@xsyu. edu. cn DOI:10 11896 / cldb 19020022
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

492. Effect of modification to H# with F on the performance of Mo-Ni/F-H# catalyst in the sulfur transfer reactions of FCC gasoline

Accession number: 20202508853416
Title of translation: FH#Mo-Ni/F-H#FCC
Authors: Liang, Sheng-Rong (1); Liu, Feng (1); Wang, Qian (1); Wu, Rui-Rui (1); Zhang, Jun-Tao (1); Shen, Zhi-Bing (1)
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Abbreviated source title: Ranliao Huaxue Xuebao J. Fuel Chem. Technol.
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Pages: 405-413
Language: Chinese
ISSN: 2097213X
E-ISSN: 18725813
CODEN: RHXUD8
Document type: Journal article (JA)
Publisher: Science Press
Abstract: H# zeolite was modified with different contents of F to prepare the Mo-Ni/F-H# catalysts. The Mo-Ni/F-H# catalysts were characterized by nitrogen physisorption, NH3-TPD, XRD, Py-FTIR and SEM; the effect of modification to H# with F on the catalytic performance of Mo-Ni/F-H# in the sulfur transfer reactions such as etherification of mercaptan and alkylation of thiophene in FCC gasoline was then investigated. The results indicate that the Mo-Ni/F-H# catalyst prepared with 0.5% F-modified H# zeolite can promote the thioetherification and thiophene alkylation reactions and improve the selectivity of dienes hydrogenation. The introduction of F can enhance the medium strong acid content of H# zeolite, reduce the strong acid content, and increase the ratio of L/B acid sites, all these may contribute to improving the catalytic performance of Mo-Ni/F-H# in the sulfur transfer reactions of FCC gasoline. © 2020, Science Press. All right reserved.
Number of references: 25
Main heading: Thiophene

Controlled terms: Alkylation - Ammonia - Catalyst selectivity - Fluorine - Gasoline - Sulfur - Zeolites
Uncontrolled terms: Acid content - Catalytic performance - FCC gasolines - Fluorine modifications - H# Zeolite - Nitrogen physisorption - Performance - Strongest acid - Sulfur transfer reactions -]+ catalyst
Classification code: 523 Liquid Fuels - 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 5.00E-01%
Funding Details: Number: 2017D#5007#0401, Acronym: -, Sponsor: -; Number: YCS19113074, Acronym: -, Sponsor: -;
Funding text: The project was supported by the China Petroleum Science and Technology Innovation Fund Project (2017D50070401), Open Fund Project of National Key Laboratory of Heavy Oil and Postgraduate Innovation and Practical Ability Training Project of Xi an University of Petroleum (YCS19113074). (2017D50070401), (YCS19113074)The project was supported by the China Petroleum Science and Technology Innovation Fund Project (2017D-5007-0401), Open Fund Project of National Key Laboratory of Heavy Oil and Postgraduate Innovation and Practical Ability Training Project of Xi'an University of Petroleum (YCS19113074).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

493. Treatment of fracturing wastewater using microalgae-bacteria consortium

Accession number: 20194307587244
Authors: Li, Ran (1, 2, 3); Pan, Jie (1); Yan, Minmin (1); Yang, Jiang (1); Qin, Wenlong (1); Liu, Yang (1, 3)
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Source title: Canadian Journal of Chemical Engineering
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Language: English
ISSN: 00084034
E-ISSN: 1939019X
CODEN: CJCEA7
Document type: Journal article (JA)
Publisher: Wiley-Liss Inc.
Number of references: 35
Main heading: Bacteriology
Controlled terms: Bacteria - Wastewater treatment
Uncontrolled terms: Bacillus bacteria - Biotreatments - Chlorella vulgaris - Micro-algae
Classification code: 452.4 Industrial Wastes Treatment and Disposal
Numerical data indexing: Mass_Density 2.00e-05kg to 8.00e-02kg, Mass_Density 2.23e+00kg/m3, Mass_Density 7.21e-02kg/m3
DOI: 10.1002/cjce.23631
Funding Details: Number: 2016JQ5102, Acronym: -, Sponsor: -; Number: 20160119, Acronym: -, Sponsor: -; Number: 51504192,51904245, Acronym: NSFC, Sponsor: National Natural Science Foundation of China; Number: 17JK0616, Acronym: -, Sponsor: Education Department of Shaanxi Province;
Funding text: This study was supported by the National Natural Science Foundation of China (No. 51504192, No. 51904245), the Natural Science Basic Research Plan of Shaanxi Province (No. 2016JQ5102), the Scientific Research Program Funded by Shaanxi Provincial Education Department (No. 17JK0616), and the Youth Talent Collection Program of Universities in Shaanxi (No. 20160119).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

494. Study of cathodic protection system for oil well casings based on pulse current

Accession number: 20202608864895
Authors: Ma, Julian (1); Zhang, Xiaoxiang (1); Yuan, Wang (1); Zhou, Haobin (1)
Author affiliation: (1) School of Material Science and Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Ma, Julian(835040138@qq.com)
Source title: Proceedings - 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Abbreviated source title: Proc. - Int. Conf. Intell. Transp., Big Data Smart City, ICITBS
Part number: 1 of 1
Issue title: Proceedings - 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Issue date: January 2020
Publication year: 2020
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Article number: 9110068
Language: English
ISBN-13: 9781728166971
Document type: Conference article (CA)
Conference name: 2020 International Conference on Intelligent Transportation, Big Data and Smart City, ICITBS 2020
Conference date: January 11, 2020 - January 12, 2020
Conference location: Vientiane, Laos
Conference code: 160946
Publisher: Institute of Electrical and Electronics Engineers Inc., United States
Abstract: Impressed Current Cathodic Protection(ICCP) is the most effective method for mitigating corrosion on oil well casings. ICCP systems are commonly based on direct current(DC) power supply, DC power supply determine the protective effect. However, traditional DC protection exist some problems, such as protect depth is not enough, uneven distribution of current and potential. In this study, a kind of cathodic protection system for oil well casing based on pulse current is designed. Pulse current is used as the polarization current required for cathodic polarization of oil wells. When electrons flow through the formation to the surface of the casing, electronic will not react with the surrounding corrosive substances at the same time. Electrons will gather at the surface of the casing, Potential direction of the casing surface is shifted to the negative direction, and Produce cathodic polarization. The effect of pulse current and direct current under simulated conditions for the well casing cathodic protection was investigated. The results indicate that under the simulated casing condition, Pulse Current Cathodic Protection(PCCP) system has better protection effect than Direct Current Cathodic Protection(DCCP) system under the same power output condition, and consumption of current is less than DCCP system. In addition, the influence of middle range of the duty ratio and frequency on the cathodic protection effect is determined. © 2020 IEEE.
Number of references: 12
Main heading: Cathodic protection
Controlled terms: Oil wells
Uncontrolled terms: Cathodic protection systems - DC power supplies - Direct current power - Effect of pulse - Impressed-current cathodic protections - Polarization current - Protection effect - Protective effects
Classification code: 512.1.1 Oil Fields - 539.2 Corrosion Protection
DOI: 10.1109/ICITBS49701.2020.00100
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

495. Enhancing the energy barrier by replacing the counterions in two holmium(iii)-pentagonal bipyramidal single-ion magnets

Accession number: 20202308794196
Authors: Li, Lei-Lei (1); Su, Hong-Dan (1); Liu, Shuang (1); Wang, Wen-Zhen (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'An Shiyou University, Xi'an; 710065, China
Corresponding author: Li, Lei-Lei(lll@xsyu.edu.cn)
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Language: English
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CODEN: DTARAF
Document type: Journal article (JA)
Publisher: Royal Society of Chemistry
Abstract: Based on a phosphine oxide ligand, HMPA (hexamethylphosphoric triamide), two mononuclear HoIII-pentagonal bipyramidal complexes were synthesized with the formulas [Ho(HMPA)2(H2O)5]2Cl6·2HMPA·2H2O (1) and [Ho(HMPA)2(H2O)5]Br3·2HMPA (2). Single-crystal X-ray diffraction results show that all HoIII ions in both the two complexes are hepta-coordinated and are located in pentagonal bipyramidal {HoO7} coordination polyhedrons constructed by two axial HMPA ligands and five equatorial water molecules. However, due to the employment of different halide ions as counterions, the second coordination sphere surrounding each [Ho(HMPA)2(H2O)5]3+ moiety is different in the two complexes: in 1, three Cl- ions, one water molecule and one HMPA ligand; in 2, three Br- ions and two HMPA ligands. Ac magnetic susceptibilities under zero dc field show that both the two complexes are single-ion magnets with effective energy barriers of 290 K and 320 K for 1 and 2, respectively. Compared with 1, the enhancement in the energy barrier of 2 is believed to be induced mainly by the change in the second coordination sphere rather than the minor differences in the {HoO7} polyhedrons. © 2020 The Royal Society of Chemistry.
Number of references: 58
Main heading: Ligands
Controlled terms: Holmium compounds - Magnetic susceptibility - Phosphorus compounds - Single crystals - Ions - Energy barriers - Magnets - Molecules - Synthesis (chemical)
Uncontrolled terms: AC Magnetic susceptibility - Coordination polyhedra - Coordination sphere - Effective energy - Equatorial water - Phosphine oxide - Single crystal x-ray diffraction - Water molecule
Classification code: 641.1 Thermodynamics - 701.2 Magnetism: Basic Concepts and Phenomena - 801.4 Physical Chemistry - 802.2 Chemical Reactions - 931.3 Atomic and Molecular Physics - 933.1 Crystalline Solids
Numerical data indexing: Temperature 2.90e+02K, Temperature 3.20e+02K
DOI: 10.1039/d0dt00905a
Funding Details: Number: 2019JZ-44, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province; Number: 2019JQ-489, Acronym: -, Sponsor: -; Number: 21901200, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;
Funding text: This work was supported financially by the National Natural Science Foundation of China (grant No. 21901200), the Nature Science Foundation of Shaanxi Province, PR China (no. 2017JQ2009 and no. 2019JQ-489), the key program of Shaanxi Natural Science Foundation (no. 2019JZ-44) and the Postgraduate Innovation and Practice Training Program of Xi'an shiyou university (no. YCS18211015). We are thankful for the support from the Modern analysis and testing center of Xi'an Shiyou University.
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

496. Catalytic Oligomerization of ethylene over nano-sized HZSM-5

Accession number: 20204009258924
Authors: Zhang, Juntao (1); Tang, Ruiyuan (1); Shen, Zhibing (1); Liang, Shengrong (1); Zhong, Hanbin (1)
Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; 710065, China
Corresponding author: Zhang, Juntao(zhangjt@xsyu.edu.cn)
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Language: English
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Abstract: The nano-sized HZSM-5 zeolites with different Si/Al ratios were pretreated, characterized, and tested in ethylene oligomerization performed in a fixed-bed reactor under relatively mild conditions. The effects of catalyst acidity and reaction temperature on the activity, selectivity and stability were investigated, and a possible reaction route of ethylene over acidic sites of nano-sized HZSM-5 catalyst was proposed. In comparison with micro-sized HZSM-5 zeolite, nano-sized HZSM-5 zeolites exhibited higher activity and better resistance to deactivation. Under optimal conditions (T = 275–300 °C, P = 3.0 MPa, WHSV = 1.0 h-1), The average ethylene conversion was 62.5% over the nano-sized HZSM-5 with an Si/Al ratio of 80, while the selectivity to C4+ olefins and α–olefins was 64.3% and 13.3%, respectively. Furthermore, the products of ethylene oligomerization were a complex hydrocarbon mixture due to the acid-catalyzed secondary reactions, for which the distribution of even and odd numbered carbon atoms formed a continuous volcanic shape mainly centered on C6–C10. Furthermore, these tests demonstrate that the activity and selectivity of ethylene oligomerization depend on the operating conditions and the acidity of the catalysts. These results indicate that the Brønsted acid sites may be mainly responsible for secondary reactions and deactivation of the catalyst, whereas the Lewis acid sites may be more advantageous for ethylene oligomerization. © 2020
Number of references: 31
Main heading: Ethylene
Controlled terms: Oligomers - Zeolites - Chemical reactors - Catalyst deactivation - Catalyst selectivity - Oligomerization - Silicon
Uncontrolled terms: Different Si/Al ratio - Ethylene conversions - Ethylene oligomerizations - Hydrocarbon mixture - Operating condition - Optimal conditions - Reaction temperature - Secondary reactions
Classification code: 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 815.1.1 Organic Polymers
Numerical data indexing: Percentage 1.33e+01%, Percentage 6.25e+01%, Percentage 6.43e+01%, Pressure 3.00e+06Pa
DOI: 10.1016/j.joei.2020.09.002
Funding Details: Number: SKLOP201901001, Acronym: -, Sponsor: State Key Laboratory of Heavy Oil Processing; Number: 2019JLM-1, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;
Funding text: This study was conducted with Basic Research Plan of Natural Science of Shaanxi Province (2019JLM-1) and Supported by State Key Laboratory of Heavy Oil Processing (SKLOP201901001).
Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

497. Two-fluid model with variable particle–particle restitution coefficient: application to the simulation of FCC riser reactor

Accession number: 20191606774992
Authors: Zhong, Hanbin (1); Zhang, Juntao (1); Liang, Shengrong (1); Zhu, Yuqin (1)
Author affiliation: (1) School of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an; Shaanxi, China
Corresponding author: Zhong, Hanbin(hanbinzhong@126.com)
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Publication year: 2020
Pages: 549-558
Language: English
ISSN: 02726351
E-ISSN: 15480046
CODEN: PTCHDS
Document type: Journal article (JA)
Publisher: Bellwether Publishing, Ltd.
Abstract: In most gas–solid fluidized bed reactors, particle–particle interactions vary as a result of the physical and/or chemical process. However, a constant value for the particle–particle restitution coefficient, a modeling parameter that can significantly affect the predicted hydrodynamics, is normally used to describe the particle–particle interaction in the simulation with the two-fluid model (TFM). Therefore, an advanced TFM with variable particle–particle restitution coefficient was developed to simulate the complex hydrodynamics and reaction behavior in the gas–solid fluidized bed reactor. The fluid catalytic cracking (FCC) riser reactor, in which the particle–particle restitution coefficient tends to

decrease during catalytic cracking reactions because of the formation of cohesive coke under high temperature, was taken as an example to illustrate the application of the advanced TFM. Simulation results indicate that the advanced TFM can successfully describe the variation of the particle–particle restitution coefficient in the computational fluid dynamics (CFD) simulation of FCC riser reactor. © 2019, © 2019 Taylor & Francis Group, LLC.
Number of references: 38
Main heading: Fluid catalytic cracking
Controlled terms: Fluidized beds - Two phase flow - Computational fluid dynamics - Supersaturation - Fluidized bed furnaces - Chemical reactors - Hydrodynamics
Uncontrolled terms: Chemical process - Computational fluid dynamics simulations - Fluid catalytic cracking(FCC) - Fluidized bed reactors - High temperature - Model parameters - Reaction behavior - Restitution coefficient
Classification code: 631.1 Fluid Flow, General - 642.2 Industrial Furnaces and Components - 723.5 Computer Applications - 801.4 Physical Chemistry - 802.1 Chemical Plants and Equipment - 802.2 Chemical Reactions - 931.1 Mechanics
DOI: 10.1080/02726351.2018.1564094
Funding Details: Number: 2018D-5007-0402, Acronym: -, Sponsor: PetroChina Innovation Foundation; Number: SKLHOP201506, Acronym: -, Sponsor: State Key Laboratory of Heavy Oil Processing;
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Compendex references: YES
Database: Compendex
Data Provider: Engineering Village

498. Fabrication of Ti-Si intermetallic compound porous membrane using an in-situ reactive sintering process

Accession number: 20201608418240
Authors: Liu, Zhongjun (1); Liu, Zhuomeng (1); Ji, Shuai (1); Liu, Yuan (1); Jing, Yuan (1)
Author affiliation: (1) College of Materials and Engineering, Xi'an Shiyou University, Xi'an; Shaanxi; 710065, China
Corresponding author: Liu, Zhongjun(zjliu@xsyu.edu.cn)
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Abbreviated source title: Mater Lett
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Article number: 127786
Language: English
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CODEN: MLETDJ
Document type: Journal article (JA)
Publisher: Elsevier B.V., Netherlands
Abstract: A low-cost and effective in-situ reactive method to produce Ti-Si intermetallic compound porous membrane is achieved for the first time using titanium powders and quartz tube (SiO2) as raw materials. Ti-Si porous membrane with small pores was fabricated on the surface of Ti porous substrate. The pore size of Ti-Si porous membrane is less than 0.5 μm with the thickness of 2 μm. The Ti-Si intermetallic compound particles and nanopores of membrane on the substrate are well distributed, and a good metallurgy bonding between the particles of Ti-Si membrane and Ti substrate indicates an effective sintering process. The in-situ reactive sintering process was an effective technology for the fabrication of Ti-Si intermetallic compound porous membrane as well as the modification of the surface morphology of porous metals. © 2020 Elsevier B.V.
Number of references: 8
Main heading: Sintering
Controlled terms: Pore size - Porous silicon - Fabrication - Morphology - Titanium compounds - Surface morphology - Intermetallics - Membranes - Silica
Uncontrolled terms: Porous membranes - Porous substrates - Quartz tubes - Si membranes - Sintering process - Situ reactive sintering - Ti substrates - Titanium powders
Classification code: 531.1 Metallurgy - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science
DOI: 10.1016/j.matlet.2020.127786

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Compendex references: YES
Database: Compendex
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