

1. Image segmentation using fuzzy clustering with spatial constraints based on markov random field via bayesian theory

Li, Xiaohe (1); Zhang, Taiyi (1); Qu, Zhan (2)

Source: *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, v E91-A, n 3, p 723-729, 2008; **ISSN:** 09168508, **E-ISSN:** 17451337; **DOI:** 10.1093/ietfec/e91-a.3.723; **Publisher:** Institute of Electronics, Information and Communication Engineers, IEICE

Author affiliation: (1) Xi'an Jiaotong University, China (2) Xi'an Shiyou University, China

Abstract: Image segmentation is an essential processing step for many image analysis applications. In this paper, a novel image segmentation algorithm using fuzzy C-means clustering (FCM) with spatial constraints based on Markov random field (MRF) via Bayesian theory is proposed. Due to disregard of spatial constraint information, the FCM algorithm fails to segment images corrupted by noise. In order to improve the robustness of FCM to noise, a powerful model for the membership functions that incorporates local correlation is given by MRF defined through a Gibbs function. Then spatial information is incorporated into the FCM by Bayesian theory. Therefore, the proposed algorithm has both the advantages of the FCM and MRF, and is robust to noise. Experimental results on the synthetic and real-world images are given to demonstrate the robustness and validity of the proposed algorithm. © 2008 The Institute of Electronics, Information and Communication Engineers. (21 refs)

Main heading: Image segmentation

Controlled terms: Membership functions - Clustering algorithms - Fuzzy clustering - Markov processes

Uncontrolled terms: Bayesian theory - Fuzzy C means clustering - Image segmentation algorithm - Local correlations - Markov Random Fields - Real-world image - Spatial constraints - Spatial informations

Classification Code: 723 Computer Software, Data Handling and Applications - 903.1 Information Sources and Analysis - 921 Mathematics - 922.1 Probability Theory

Database: Compendex

Data Provider: Engineering Village

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2. A novel method to construct capillary pressure curves by using NMR log data and its application in reservoir evaluation

Xiao, Liang (1); Yuan, Yun-Chao (1); Chen, Zhao-Ming (2)

Source: *International Petroleum Technology Conference, IPTC 2008*, v 1, p 363-371, 2008, *International Petroleum Technology Conference, IPTC 2008*; **ISBN-13:** 9781605609546; **Conference:** 16th International Colloquium on Structural Information and Communication Complexity, SIROCCO 2009, May 25, 2009 - May 27, 2009; **Publisher:** Society of Petroleum Engineers

Author affiliation: (1) Xi'an Shiyou University, China (2) Shenzhen Branch of CNOOC, China

Abstract: By analyzing hundreds of capillary pressure curves, the controlling factors of shape and type of capillary pressure curves are found and a novel method is presented to construct capillary pressure curves by using reservoir permeability and a synthesized index. The accuracy of this new method is verified by mercury-injection experiments. Considering the limited quantity of capillary pressure data, a new method is developed to extract the Swanson parameter from the NMR T2 distribution and estimate reservoir permeability. Integrating with NMR total porosity, reservoir capillary pressure curves can be constructed, which could be used to evaluate reservoir pore structure and calculate reservoir originality water saturation in the intervals with NMR log data. At last, the constructed NMR capillary pressure curve by this new method is used in well site to detect the change in reservoir pore structure and initial water saturation as a function of depth, comparison among the calculated result, core data and Archie water saturation, demonstrate the responsibility and accuracy. Copyright 2008, Society of Petroleum Engineers. (20 refs)

Main heading: Pore structure

Controlled terms: Capillarity - Capillary tubes - Petroleum reservoir evaluation - Petroleum reservoirs

Uncontrolled terms: Capillary pressure curves - Controlling factors - Initial water saturation - ITS applications - Mercury injection - Reservoir permeability - Swanson parameter - Water saturations

Classification Code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 619.1 Pipe, Piping and Pipelines - 631.1 Fluid Flow, General - 931.2 Physical Properties of Gases, Liquids and Solids

Database: Compendex

Data Provider: Engineering Village

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3. Simulation of the humanoid running robot based on ADAMS

Wei, Hangxin (1); Wu, Wei (1); Liu, Mingzhi (2)

Source: *Proceedings - UKSim 10th International Conference on Computer Modelling and Simulation, EUROSIM/UKSim2008*, p 726-731, 2008, *Proceedings - UKSim 10th International Conference on Computer Modelling and*

Simulation, EUROSIM/UKSim2008; **ISBN-10:** 0769531148, **ISBN-13:** 9780769531144; **DOI:** 10.1109/UKSIM.2008.24; **Article number:** 4489022; **Conference:** UKSim 10th International Conference on Computer Modelling and Simulation, EUROSIM/UKSim2008, April 1, 2008 - April 3, 2008; **Publisher:** IEEE Computer Society

Author affiliation: (1) Xi'an Shiyou University, Xi'an City, China (2) Xidian University, Xi'an City, China

Abstract: The virtual model of the humanoid running robot is built by using the software ADAMS. With this model, one can research the problem how to realize the running of a humanoid robot without the physical model of the robot. In addition, a method of realizing running for the robot based on virtual leg is proposed. The robot can run stably by planning the trajectory of the center of mass (COM) and the trajectory of two feet of the robot. The trajectory of the COM of the robot is mainly planned by the dynamic equation of the virtual leg of the robot. After this method is used in the virtual model of the robot, the robot can run at a speed of 2.9m/s. The simulation results show the validity of this method. © 2008 IEEE. (12 refs)

Main heading: Anthropomorphic robots

Controlled terms: Trajectories - Robot programming

Uncontrolled terms: Center of mass - Dynamic equations - Humanoid robot - Physical model - Running robots - Software ADAMS - Virtual modeling

Classification Code: 723.1 Computer Programming - 731.5 Robotics

Database: Compendex

Data Provider: Engineering Village

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4. FBG sensor of measuring pressure with lag of stress active compensation and with temperature active compensation

Wang, Hong-Liang (1); Qiao, Xue-Guang (1); Fu, Hai-Wei (1); Feng, De-Quan (1); Li, Dong-Ming (1)

Source: *Guangdianzi Jiguang/Journal of Optoelectronics Laser*, v 19, n 1, p 1-5, January 2008; **Language:** Chinese;

ISSN: 10050086; **Publisher:** Board of Optronics Lasers

Author affiliation: (1) College of Sciences, Xi'an Shiyou University, Xi'an 710065, China

Abstract: Adopting the design of the structure combining Bourdon tube with cantilever beam with two FBG which have same wavelengths and are symmetry affixed on the cover surface and the bottom surface of cantilever beam respectively, the tuned method of the pressure tune two FBG's Bragg wavelength difference is realized. The theoretical analysis and experimental results show that the sensor has the function of the elasticity lag and aftereffect active compensation with temperature active compensation, and two-FBG's Bragg wavelength difference is linear to the pressure, in the range of 0-20 MPa, the maximal wavelength difference of 5.6 nm can be gotten. The sensitivities of the pressure tune two FBG's Bragg wavelength difference is 0.28 nm/MPa, which is about 2 times the value of the pressure tune single FBG's Bragg wavelength. The standard errors of are reduce from 0.066 nm of single FBG to 0.0084 nm of two-FBG's. (7 refs)

Main heading: Fiber optic sensors

Controlled terms: Cantilever beams - Elasticity - Fiber Bragg gratings - Guided electromagnetic wave propagation - Pressure sensors

Uncontrolled terms: After effect active compensation - Elasticity lag - Fiber Bragg grating (FBG) sensor - Guided wave

Classification Code: 711.1 Electromagnetic Waves in Different Media - 732.2 Control Instrumentation - 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 931.1 Mechanics - 944.3 Pressure Measuring Instruments

Treatment: Experimental (EXP)

Database: Compendex

Data Provider: Engineering Village

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5. Fatigue life prediction of old steel structure

Li, Zhen (1)

Source: *Jixie Qiangdu/Journal of Mechanical Strength*, v 30, n 5, p 784-788, August 2008; **Language:** Chinese; **ISSN:** 10019669; **Publisher:** Journal of Mechanical Strength

Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: The expression for fatigue crack initiation life (FCI life) of an old steel structure material was predicted based on the tensile test results. The predicted life curve was compared with the experimental result of notched specimens. More importantly, for specimen cut from old steel structure beam with the original rivet holes, the fatigue life under variable amplitude was predicted. For the metals with non-continuous strain hardening characteristics, Miner's rule and FCI life expression can be used to predict the FCI life under variable amplitude. The life prediction procedure has been

substantiated by the experimental results. In the case that the FCI life occupied the dominant proportion of the fatigue life, the procedure can be used to predict the fatigue life under variable amplitude. (11 refs)

Database: Compendex

Data Provider: Engineering Village

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6. Method to calculate reservoir permeability using nuclear magnetic resonance logging and capillary pressure data

Xiao, Zhong-Xiang (1); Xiao, Liang (1)

Source: *Yuanzineng Kexue Jishu/Atomic Energy Science and Technology*, v 42, n 10, p 868-871, October 2008;

Language: Chinese; **ISSN:** 10006931; **Publisher:** Atomic Energy Publishing House

Author affiliation: (1) College of Petroleum Resources, Xi'an Shiyou University, Xi'an 710065, China

Abstract: In view of the problems of SDR and Tim-Coates models in calculating permeability using nuclear magnetic resonance logging data, based on the fact that nuclear magnetic resonance T2 distribution and capillary pressure curves reflect the reservoir pore structure, a method was presented to calculate reservoir permeability using nuclear magnetic resonance logging and capillary pressure data. The correlation between Swanson parameter and permeability was established by comparing 31 core samples which were measured by mercury penetration and nuclear magnetic resonance logging. Considering the problem that capillary pressure data are limited by their quantity, the good correlativity between T2 geometric mean value of lateral relaxation time of nuclear magnetic resonance and Swanson parameter can be used to determine the Swanson parameter and to calculate reservoir permeability consecutively. The processing of the data in well A yields a permeability closer to the result of core analysis, and this indicates the accuracy of the method. (10 refs)

Main heading: Nuclear magnetic resonance

Controlled terms: Capillary tubes - Magnetism - Nuclear magnetic logging - Data handling - Petroleum reservoir engineering - Petroleum reservoirs - Capillarity

Uncontrolled terms: Capillary pressure curves - Geometric mean value - Nuclear magnetic resonance logging - Reservoir permeability - Reservoir pores - Swanson parameter

Classification Code: 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 619.1 Pipe, Piping and Pipelines - 631.1 Fluid Flow, General - 701.2 Magnetism: Basic Concepts and Phenomena - 723.2 Data Processing and Image Processing

Database: Compendex

Data Provider: Engineering Village

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7. Model of hyper topology structure about associative thinking

Jiaxin, Han (1); Xiaoxiao, Wang (1)

Source: *Proceedings - 4th International Conference on Natural Computation, ICNC 2008*, v 2, p 637-641, 2008, *Proceedings - 4th International Conference on Natural Computation, ICNC 2008*; **ISBN-13:** 9780769533049;

DOI: 10.1109/ICNC.2008.398; **Article number:** 4667072; **Conference:** 4th International Conference on Natural Computation, ICNC 2008, October 18, 2008 - October 20, 2008; **Sponsor:** Int. Natural Computation and Knowledge Discovery Assoc. (INCKDA); **Publisher:** IEEE Computer Society

Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an, 710065, China

Abstract: This paper researches the essential discipline of reminding thinking based on the practical structure of knowledge presentation, then brings forward the model of Hyper Topology Structure. And it gives not only a method for reminding computing which could integrate to deal with analogy and opposite correlation but also a reminding algorithm of first levels. It is proved that the model is a general one about reminding thinking indeed. © 2008 IEEE. (8 refs)

Main heading: Topology

Uncontrolled terms: Associative thinking - Paper research - Structure of knowledge - Topology structure

Classification Code: 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory

Database: Compendex

Data Provider: Engineering Village

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8. Research on fuzzy self-adaptive pi and variable damping controlling system of MRST stabilized platform

Duan, Zhengyong (1); Peng, Yong (1)

Source: 2nd International Symposium on Test Automation and Instrumentation, ISTAI 2008, p 2244-2247, 2008, 2nd International Symposium on Test Automation and Instrumentation, ISTAI 2008; **Conference:** 2nd International Symposium on Test Automation and Instrumentation, ISTAI 2008, November 17, 2008 - November 18, 2008; **Sponsor:** China Instrumentation and Control Society (CIS); **Publisher:** International Academic Publishers
Author affiliation: (1) Mechanical Engineering College of Xi'an Shiyou University, Xi'an 710065, China
Abstract: This paper takes the control system of the rotary steerable drilling tool (MRST) stabilized platform as the study object, using the advanced controlling methods of fuzzy self-adaptive PI and fuzzy variable damping, one controlling scheme named "Fuzzy Self-adaptive PI and Variable Damping" has been putted forward, emphasizedly finished the designs on two controllers of Fuzzy Self-adaptive PI and Fuzzy Variable Damping and acquired three very important control rule tables. The simulation results of the control system show that, the adjusting time is only about 0.4s, the overshooting is less than 1.5% and the steady-state error is not more than 0.05%, exhibiting good quick-responsibility, stability and noise immunity. The fuzzy control algorithm realizes the control system's parameters: KP, KI and Ct and the control system has good self-adaptation and robustness. (5 refs)
Main heading: Fuzzy control
Controlled terms: Adaptive control systems - Damping
Uncontrolled terms: Advanced controlling - Controlling system - Fuzzy self-adaptive - Rotary-steerable drilling - Simulation - Stabilized platform - Steady state errors - Variable damping
Classification Code: 731 Automatic Control Principles and Applications - 731.1 Control Systems - 931.1 Mechanics
Database: Compendex
Data Provider: Engineering Village
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9. Characteristics and influencing factors of movable fluid in ultra-low permeability sandstone reservoir

Wang, Ruifei (1); Chen, Mingqiang (1)

Source: *Shiyou Xuebao/Acta Petrolei Sinica*, v 29, n 4, p 558-561+566, July 2008; **Language:** Chinese; **ISSN:** 02532697; **Publisher:** Science Press

Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: The sandstone samples of the ultra-low permeability reservoir in Yanchang Formation of Ordos Basin were tested with the nuclear magnetic resonance technique. The porosity parameter was defined to analyze the characteristics and the influencing factors of movable fluid. The existing characteristics of movable fluid include the following aspects: The amplitude of T2 spectrum is relatively low, and the content of movable fluid is also low. The parameters of movable fluid is expanse and the heterogeneity is intense. The relation between the movable fluid parameter and the permeability gets better with the increase of permeability. The movable fluid parameter gets higher attenuation velocity with decrease of permeability and has more sensitivity to the changes of permeability. The micro-pore structure determines the existing state of fluid. The main influencing factors of the movable fluid include micro-fracture, filling degree of clay mineral in pores, secondary porosity and recrystallization. (17 refs)

Main heading: Porosity

Controlled terms: Sandstone - Petroleum reservoir engineering - Nuclear magnetic resonance - Pore structure - Low permeability reservoirs - Metamorphic rocks

Uncontrolled terms: Distribution feature micro-pore structure - Movable fluid - Movable fluid porosity - Nuclear magnetic resonance techniques - Ordos Basin - Ultra-low permeability sandstone reservoir

Classification Code: 482.2 Minerals - 512.1 Petroleum Deposits - 512.1.2 Petroleum Deposits : Development Operations - 931.2 Physical Properties of Gases, Liquids and Solids

Database: Compendex

Data Provider: Engineering Village

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10. Determination of favorable oil-bearing areas with extra low-permeability reservoir by 'dessert' of petro-physical facies

Song, Ziqi (1); Tang, Changjiu (1); Liu, Xiaojuan (1); Pang, Zhenyu (1); Wang, Ruifei (1)

Source: *Shiyou Xuebao/Acta Petrolei Sinica*, v 29, n 5, p 711-716, September 2008; **Language:** Chinese; **ISSN:** 02532697; **Publisher:** Science Press

Author affiliation: (1) School of Petroleum Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: The extra low-permeability reservoirs in the middle part of Shaanbei slope are affected by many factors, such as sedimentary environment, diagenesis and structure. Both macroscopic physical property and micropore types of these reservoirs have strong heterogeneity, so the quality and percolation structure of the reservoir have a large difference. The flow zones are complex in the extra low-permeability reservoirs of the middle part of Shaanbei slope. A

determination method was presented for favorable oil-bearing areas in the extra low-permeability reservoir using flow units of petro-physical facies. A comprehensive evaluation system of 'dessert' of petro-physical facies was developed using various parameters for describing geologic features of porous medium, including flow zone indicator, energy storage parameters, diagenetic synthetical coefficient, thickness of single-permeability sandstone, effective thickness of oil layers, the ratio of sand body to formation thickness, permeability, porosity, shale content, and distribution frequency and density of inter-players. Above various parameters including permeability and storage capability, oil and gas bearing features and heterogeneity of reservoirs were integrated and synthesized by gray theory. The locations and distribution of favorable oil-bearing area were effectively determined by using 'dessert' of Type I and Type II petro-physical facies. The results could fully reflect geological features of the favorable oil-bearing areas in the extra low-permeability reservoirs. (24 refs)

Main heading: Low permeability reservoirs

Controlled terms: Petroleum reservoir engineering - Sedimentology - Solvents - Parameter estimation - Porous materials - Gas permeability - Oil bearing formations

Uncontrolled terms: Comprehensive evaluation index - Distribution regularities - Extra low-permeability - Favorable oil-bearing areas - Formation parameter - Gray theories - Petro-physical facies

Classification Code: 481.1 Geology - 512.1 Petroleum Deposits - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 803 Chemical Agents and Basic Industrial Chemicals - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science

Database: Compendex

Data Provider: Engineering Village

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11. Study on micro-facies analysis technique for Hua 64 block in Nanliang Oilfield

Zhao, Junlong (1)

Source: *Shiyou Xuebao/Acta Petrolei Sinica*, v 29, n 2, p 274-276+283, March 2008; **Language:** Chinese; **ISSN:** 02532697; **Publisher:** Science Press

Author affiliation: (1) School of Petroleum Resources, Xi'an Shiyou University, Xi'an 710065, China

Abstract: The division plan of sedimentary facies was determined by using plentiful identifying symbols of sedimentary facies and the practical data in Hua 64 block of Nanliang Oilfield. The reasonable technique for sedimentary micro-facies analysis was proposed on the basis of micro-facies research content and requirement. The wavelet analysis technique, grey system technique, cross plot and log facies analysis technique were used to research the micro-facies pattern. The research results can provide the base for making regulation plan of oilfield exploitation. (11 refs)

Main heading: Oil fields

Controlled terms: Oil field development - Petroleum reservoir evaluation - Petroleum reservoirs - Sedimentology - Sediments - Wavelet analysis

Uncontrolled terms: Cored well - Grey system analysis - Log facies analysis - Micro-facies pattern - Nanliang Oilfield - Sedimentary microfacies identification

Classification Code: 481.1 Geology - 483 Soil Mechanics and Foundations - 512.1.1 Oil Fields - 512.1.2 Petroleum Deposits : Development Operations - 921 Mathematics

Treatment: Applications (APP)

Database: Compendex

Data Provider: Engineering Village

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12. Reactive power optimization for oil field distribution power system based on hopfield neural network

Gao, Weixin (1)

Source: *Journal of Computational Information Systems*, v 4, n 5, p 1879-1884, October 2008; **ISSN:** 15539105;

Publisher: Binary Information Press

Author affiliation: (1) School of Electrical Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: This paper presents a new mathematical model of reactive power optimization for distribution system. The new model is to minimize the sum of running expense and of investing expense. An associate matrix for describing the topology of the radical distribution system is introduced. Based on the associate matrix, Hopfield neural network is used to solve the mathematical model. The energy function can optimize simultaneously the running expense and the investing expense of a distribution system. The problem of overcompensation is also taken into consideration in the energy function. The dynamic function of the neural network is derived from the energy function. The characteristics of the dynamic function are analyzed, too. By calculating the dynamic function, the overall capacity and the compensation scheme of each load node can be decided simultaneously. A reactive power optimization scheme for a distribution

system in a western large oil field is obtained by using Hopfield neural network, and the calculated scheme is better than the one obtained from existing documentations. © 2008 Binary Information Press. (14 refs)

Main heading: Hopfield neural networks

Controlled terms: Oil well flooding - Reactive power

Uncontrolled terms: Compensation scheme - Distribution systems - Dynamic functions - Energy functions - Field distribution - New mathematical model - Radical distributions - Reactive power optimization

Classification Code: 511.1 Oil Field Production Operations

Database: Compendex

Data Provider: Engineering Village

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13. A new method to evaluate reservoir pore structure consecutively using NMR and capillary pressure data

Xiao, Liang (1); Mao, Zhi-Qiang (2); Xiao, Zhong-Xiang (1); Zhang, Chong (2)

Source: *49th Annual Logging Symposium 2008*, 2008, *49th Annual Logging Symposium 2008*; **Conference:** SPWLA 49th Annual Logging Symposium 2008, May 25, 2008 - May 28, 2008; **Publisher:** Society of Petrophysicists and Well-Log Analysts (SPWLA)

Author affiliation: (1) Xi'an Shiyu University, Shanxi, China (2) China University of Petroleum, Beijing, China

Abstract: It is very important to understand reservoir pore structure information in finding interested zones and formulating advisable recovery scheme. Capillary pressure data is critical material in evaluating reservoir pore structure, from which, pore size distribution and pore structure parameters can be acquired, and by which, the quality of reservoir pore structure can also be identified. With the analysis of hundreds of capillary pressure curves, it is found that they all have the same mercury-injection pressure, so the differences in shape and type of capillary pressure curves are controlled by the mercury-injection saturation. For capillary pressure curves with better quality, the mercury-injection saturation is relative higher in the same mercury-injection pressure, and the reservoir porosity and permeability are also higher, vice versa. Based on which, we develop a novel method to construct capillary pressure curves consecutively integrating reservoir porosity and permeability. Correlations among mercury-injection saturation and porosity and permeability in every mercury-injection pressure are established. With this correlation, the capillary pressure curves can be constructed. Generally, capillary pressure curves are exhibited in semi-log coordinate, mercury-injection saturation is linear in X-axis and mercury-injection pressure is logarithm in Y-axis. If we display them in log-log axis, they will be hyperbolic curves. The ratio between mercury-injection saturation and mercury-injection pressure in the inflexions of hyperbolic curves are named Swanson parameters, which have a good relationship with reservoir synthesized index, from which, we can derive reservoir permeability. The problem of evaluating reservoir pore structure consecutively is the limitation of quantity of capillary pressure data because of the expensive test cost. As is known to all that NMR T2 spectrum contains plenty of information of pore structure, porosity and permeability, we present a model to extract Swanson parameter from NMR T2 distribution. With this parameter, we can gain reservoir permeability, associating with NMR total porosity, the reservoir capillary pressure curves can be constructed consecutively. Comparison with the capillary pressure curves of mercury-injection experiment demonstrates that they are commensurate. At last, an in-situ example is exhibited of evaluating reservoir pore structure using constructive capillary pressure curves consecutively by above method, which shows that it is available and accurate in detecting the change of reservoir pore structure as a function of depth. © 2008 Society of Petrophysicists and Well-Log Analysts. All rights reserved. (15 refs)

Main heading: Pore structure

Controlled terms: Capillary tubes - Mercury (metal) - Capillarity - Petroleum reservoir engineering - Pore size

Uncontrolled terms: Capillary pressure curves - Hyperbolic curves - Mercury injection - Reservoir permeability - Reservoir porosity - Structure information - Structure parameter - Swanson parameter

Classification Code: 512.1.2 Petroleum Deposits : Development Operations - 549.3 Nonferrous Metals and Alloys excluding Alkali and Alkaline Earth Metals - 619.1 Pipe, Piping and Pipelines - 631.1 Fluid Flow, General - 931.2 Physical Properties of Gases, Liquids and Solids - 951 Materials Science

Database: Compendex

Data Provider: Engineering Village

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14. Study on pump fault diagnosis based on rough sets theory

Wang, Jiangping (1); Bao, Zefu (1)

Source: *3rd International Conference on Innovative Computing Information and Control, ICICIC'08*, p 288-291, 2008, *3rd International Conference on Innovative Computing Information and Control, ICICIC'08*; **ISBN-13:** 9780769531618;

DOI: 10.1109/ICICIC.2008.526; **Article number:** 4603477; **Conference:** 3rd International Conference on Innovative Computing Information and Control, ICICIC'08, June 18, 2008 - June 20, 2008; **Publisher:** IEEE Computer Society
Author affiliation: (1) School of Mechanical Engineering, Xi'an Shiyou University, Xi'an, Shaanxi 710065, China
Abstract: In this paper, a rough classifier based on Rough Sets theory is studied and employed to diagnose and identify five-plunger pump faults. To do so, the spectrum features of vibration signals collected in the flood end of the pump are abstracted as the attributes of the learning samples. Then attribute reduction is carried out to generate the decision rules used to classify technical states of considered object. The diagnostic investigation is done on data from a five-pump in outdoor conditions on a real industrial object. Results show that the new approach can effectively identify different operating states of the pump, which supplies as the basis for the detection and diagnosis of the pump faults. © 2008 IEEE. (4 refs)

Main heading: Pumps

Controlled terms: Computation theory - Failure analysis - Fault detection - Spectrum analysis - Rough set theory

Uncontrolled terms: Attribute reduction - Decision rules - Detection and diagnosis - Learning samples - Operating state - Spectrum features - Technical state - Vibration signal

Classification Code: 618.2 Pumps - 721.1 Computer Theory, Includes Formal Logic, Automata Theory, Switching Theory, Programming Theory - 921.4 Combinatorial Mathematics, Includes Graph Theory, Set Theory

Database: Compendex

Data Provider: Engineering Village

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15. A distribution network reconfiguration algorithm based on hopfield neural network

Gao, Weixin (1); Tang, Nan (1); Mu, Xiangyang (1)

Source: *Proceedings - 4th International Conference on Natural Computation, ICNC 2008*, v 3, p 9-13, 2008,

Proceedings - 4th International Conference on Natural Computation, ICNC 2008; **ISBN-13:** 9780769533049;

DOI: 10.1109/ICNC.2008.147; **Article number:** 4667091; **Conference:** 4th International Conference on Natural Computation, ICNC 2008, October 18, 2008 - October 20, 2008; **Sponsor:** Int. Natural Computation and Knowledge Discovery Assoc. (INCKDA); **Publisher:** IEEE Computer Society

Author affiliation: (1) Shaanxi Key Laboratory of Oil-Drilling Rigs Controlling Technique, Xi'an Shiyou University

Abstract: On the base of Hopfield neural network, the minimum of feeder losses is treated as the target function. Because the distribution network is radical, we put forward a method for deciding each node's in-degree by using Hopfield neural network. According to each node's in-degree, it can be easily determined whether the line will be used or not. So the state of switch and the scheme of reconfiguration can be decided correspondingly. The energy function of Hopfield neural network is given in this paper. The problems of satisfying the restriction of radial supplying and minimizing the feeder power losses are considered in the energy function simultaneously. The energy function even takes the problem that some lines may have no switches into consideration. By calculating an IEEE distribution network with three power sources, it can be found that the calculated result of Hopfield neural network is somewhat similar to the result obtained by the more complex genetic algorithm. Since the former is to calculate a group of differential function, so the calculation time needed is comparatively less. © 2008 IEEE. (15 refs)

Main heading: Hopfield neural networks

Controlled terms: Genetic algorithms

Uncontrolled terms: Calculation time - Complex genetic algorithms - Differential functions - Distribution network reconfiguration - Energy functions - In-Degree - Power sources - Target functions

Classification Code: 461.1 Biomedical Engineering - 612.2 Diesel Engines - 691 Bulk Handling and Unit Loads - 691.2 Materials Handling Methods - 703.1 Electric Networks - 704.1 Electric Components - 706.1.2 Electric Power Distribution - 716 Telecommunication; Radar, Radio and Television - 717 Optical Communication - 718 Telephone Systems and Related Technologies; Line Communications - 723 Computer Software, Data Handling and Applications - 723.4 Artificial Intelligence - 741.3 Optical Devices and Systems - 921 Mathematics - 922.1 Probability Theory

Database: Compendex

Data Provider: Engineering Village

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16. Influence of alloying element diffusion on fabricating Ti matrix composites

Lu, Xianghong (1); Yang, Yanqing (2); Zhao, Guoxian (1)

Source: *Xiyou Jinshu Cailiao Yu Gongcheng/Rare Metal Materials and Engineering*, v 37, n 8, p 1329-1335, August 2008; **Language:** Chinese; **ISSN:** 1002185X; **Publisher:** Rare Metals Materials and Engineering Press

Author affiliation: (1) Xi'an Shiyou University, Xi'an 710065, China (2) Northwestern Polytechnical University, Xi'an 710072, China

Abstract: Based on Kolher's ternary solution model and Miedema's model for calculating the heats of formation of ternary solution, the activity coefficients and activity interaction coefficients in Ti6Al4V, Ti600, Super α_2 and Ti2AlNb are obtained. According to thermo-dynamical factors in diffusion as well as the self-diffusion coefficients of alloying elements, the further step is to get the inter-diffusion coefficients. The activity coefficients of Ti in the four alloys are in the following order: $\#Ti_{in,Ti6Al4V} > \#Ti_{in,Ti600} > \#Ti_{in,super2} > \#Ti_{in,Ti2AlNb}$, and the order of inter-diffusion coefficients of Al in the matrix is as follows: $DAI_{in,t_i600} > DAI_{in,Ti6Al4V} > DAI_{in,super2} > DAI_{in,Ti2AlNb}$. (23 refs)

Main heading: Titanium alloys

Controlled terms: Alloying elements - Ternary alloys - Activity coefficients - Aluminum alloys - Diffusion in liquids - Alloying

Uncontrolled terms: Element diffusion - Heats of formation - Inter-diffusion coefficients - Interaction coefficient - Miedema - Self-diffusion coefficients - Ternary solution - Ti-matrix composites

Classification Code: 531.1 Metallurgy - 541.2 Aluminum Alloys - 542.3 Titanium and Alloys - 801.4 Physical Chemistry

Database: Compendex

Data Provider: Engineering Village

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17. A fracture model of corrosion fatigue crack propagation of aluminum alloys based on the material elements fracture ahead of a crack tip

Wang, Rong (1)

Source: *International Journal of Fatigue*, v 30, n 8, p 1376-1386, August 2008; **ISSN:** 01421123; **DOI:** 10.1016/j.ijfatigue.2007.10.007; **Publisher:** Elsevier Ltd

Author affiliation: (1) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an, 710065, China

Abstract: In this study, attempts were made to extend the concept of material elements fracture ahead of a crack tip during fatigue crack propagation (FCP) to corrosion fatigue crack propagation (CFCP) of aluminum alloys in a corrosive environment. Considering the effect of corrosion damage on the material elements, anodic dissolution and hydrogen embrittlement, a corrosion-blunting-fracture model for CFCP was developed. The expression for the CFCP rate, $(da/dN)_{cf} = Bcf(\#K - \#K_{thcf})^2$, which reveals the correlation between the CFCP rate and stress intensity factor range, the CFCP threshold, loading frequency, anodic dissolution rate and hydrogen embrittlement of the material elements, is thus derived. The test results and analysis of the CFCP rates of LY12CZ and LC4CS aluminum alloys show that the expression for the CFCP rate gives a good fit to the test results of the CFCP rates in a 3.5% NaCl environment at loading frequency 10 Hz and stress ratios from 0.1 to 0.7. The analysis results of other aluminum alloys 7075-T7651 and 7049-T73 obtained by the CFCP rate expression are in good agreement with the test results of the CFCP rates in a 3.5% NaCl environment at loading frequencies from 0.1 to 10 Hz and a constant stress ratio. © 2007 Elsevier Ltd. All rights reserved. (30 refs)

Main heading: Corrosion fatigue

Controlled terms: Aluminum alloys - Corrosive effects - Crack tips - Fatigue crack propagation

Uncontrolled terms: Corrosive environment - Fracture model - Material elements

Classification Code: 421 Strength of Building Materials; Mechanical Properties - 539.1 Metals Corrosion - 541.2 Aluminum Alloys

Treatment: Theoretical (THR)

Database: Compendex

Data Provider: Engineering Village

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18. Sedimentary and evolutionary characteristics of dereliction deltas in Chang 6 - Chang 2 oily members, Zhidan region, northern Shaanxi (Open Access)

Wang, Jian-Min (1)

Source: *Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development*, v 35, n 2, p 182-187, April 2008;

Language: Chinese; **ISSN:** 10000747; **Publisher:** Science Press

Author affiliation: (1) School of Oil and Gas Resources, Xi'an Shiyou University, Xi'an 710065, China

Abstract: The study using well logging data and the sedimentological method reveals that large deltas and lake systems developed time and again in the Chang 6 - Chang 2 depositional stage in the Zhidan region, and a good intraplot source-reservoir-cap assemblage and widely spread oil-bearing series are formed. In sub-south-north cross-section, the Chang 6 - Chang 2 sedimentary association shows that deltaic deposits progressively overlapped lake deposits from bottom to top and from north to south, forming upward coarsening dereliction depositional sequences; sedimentary facies belts moved continually towards the lake center from north to south, deltafront subfacies spreaded extensively and overlapped in multiphases, forming the main intraplot depositional body. Deltafront subfacies may be

subdivided into underwater distributaries plain and anterior margin river mouth subfacies, and the main sand bodies are river mouth sand bank and distributaries channel sand body; the Chang 6 stage's anterior margin river mouth subfacies in the region were well developed; to Chang 2 stage, underwater distributaries plain subfacies extended and developed rapidly, and deltaic plain subfacies began to come into the region. (11 refs)

Main heading: Petroleum deposits

Controlled terms: Coarsening - Petroleum reservoir evaluation - Petroleum reservoirs - Sand - Sediment transport - Sedimentary rocks - Sedimentology - Well logging

Uncontrolled terms: Dereliction deltas - Dereliction type delta - Mesozoic - Zhidan region

Classification Code: 481.1 Geology - 481.4 Geophysical Prospecting - 483.1 Soils and Soil Mechanics - 512.1.1 Oil Fields - 951 Materials Science

Funding Details: Number: 2006Z07, Acronym: -, Sponsor: Natural Science Foundation of Shaanxi Province;

Funding text: Received date: 17 May 2006; Revised date: 17 October 2007 * Corresponding author. E-mail: shxy-wjm2003@163.com Foundation item: Supported by the Natural Science Foundation of Shaanxi Province, China (2006Z07). Copyright © 2008, Research Institute of Petroleum Exploration and Development, PetroChina. Published by Elsevier BV. All rights reserved.

Treatment: Applications (APP)

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

19. An algorithm for unit commitment based on hopfield neural network

Gao, Weixin (1); Tang, Nan (1); Mu, Xiangyang (1)

Source: *Proceedings - 4th International Conference on Natural Computation, ICNC 2008*, v 2, p 286-290, 2008, *Proceedings - 4th International Conference on Natural Computation, ICNC 2008*; **ISBN-13:** 9780769533049;

DOI: 10.1109/ICNC.2008.148; **Article number:** 4667002; **Conference:** 4th International Conference on Natural Computation, ICNC 2008, October 18, 2008 - October 20, 2008; **Sponsor:** Int. Natural Computation and Knowledge Discovery Assoc. (INCKDA); **Publisher:** IEEE Computer Society

Author affiliation: (1) Shaanxi Key Laboratory of Oil-Drilling Rigs Controlling Technique, Xi'an Shiyou University

Abstract: This paper presents an algorithm, which is based on a Hopfield neural network, for determining unit commitment. By constructing an appropriate energy function, a single layer Hopfield neural network can solve the problem of assigning output power of generators at any given time. Based on this single layer Hopfield neural network, a multi-layer Hopfield neural network is presented. The multi-layer Hopfield neural network can solve the problem of power system unit commitment. The energy functions of single layer and multi-layer Hopfield neural network and the corresponding algorithm are given in the paper. The restricted conditions of the balance between power supply and demand, maximum and minimum outputs of power plants are considered in the energy function. So is the speed of propulsion and decreasing power of generators. An example shows that the result obtained by Hopfield neural network is somewhat similar to that obtained by genetic algorithm, but the calculation time is much shorter. © 2008 IEEE. (16 refs)

Main heading: Economics

Controlled terms: Genetic algorithms - Network layers - Electric power systems - Hopfield neural networks

Uncontrolled terms: Calculation time - Energy functions - Output power - Power supply - Power system - Single layer - Unit-commitment

Classification Code: 706.1 Electric Power Systems - 723 Computer Software, Data Handling and Applications - 971 Social Sciences

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

20. High-accuracy real time calibration of tunable Fabry-Pérot filter on large range

Qiao, Xueguang (1); Wang, Yu (1); Fu, Haiwei (1); Zhao, Dazhuang (1); Wang, Wei (1); Zhang, Jing (1)

Source: *Guangxue Xuebao/Acta Optica Sinica*, v 28, n 5, p 852-855, May 2008; **Language:** Chinese; **ISSN:** 02532239; **DOI:** 10.3788/AOS20082805.0852; **Publisher:** Chinese Optical Society

Author affiliation: (1) Shaanxi Key Laboratory of Photoelectronic Sensing Logging, Xi'an Shiyou University, Xi'an 710065, China

Abstract: Absorption spectrum of acetylene (C₂H₂) is used as the wavelength reference to calibrate the tunable fiber Fabry-Pérot (TFFP) filter in real time, and the accuracy of interrogation system based on TFFP has been improved. According to the free spectrum periodic characteristic of TFFP, a method to increase the wavelength calibration range

was proposed. The system has a resolution of 1 pm over a working range of 1525-1615 nm in experiment. Compared with many traditional wavelength reference methods, this interrogation method is greatly improved in measurement precision, wavelength range and working reliability. (8 refs)

Main heading: Absorption spectroscopy

Controlled terms: Bandpass filters - Fabry-Perot interferometers - Calibration - Fibers - Optical variables measurement - Demodulation - Fiber optic sensors

Uncontrolled terms: Fiber-optical - Gas cell - Interrogation system - Measurement precision - Real-time calibration - Rot filter - Signal demodulation - Wavelength calibration

Classification Code: 703.2 Electric Filters - 741.1.2 Fiber Optics - 941.3 Optical Instruments - 941.4 Optical Variables Measurements

Database: Compendex

Data Provider: Engineering Village

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21. Experimental study of signal demodulation key hardware electric circuit for fiber grating

Jia, Zhen-An (1); Zhang, Lei (1); Qiao, Xue-Guang (1); Ma, Chao (1)

Source: *Guangdianzi Jiguang/Journal of Optoelectronics Laser*, v 19, n 3, p 315-317, March 2008; **Language:**

Chinese; **ISSN:** 10050086; **Publisher:** Board of Optronics Lasers

Author affiliation: (1) Shanxi Key Laboratory of Photoelectric Sensing Logging, Xi'an Shiyou University, Xi'an 710065, China

Abstract: Based on the principle of tunable fiber Fabry-Perot(TF F-P) filter which scans the reflected peak of fiber Bragg grating(FBG), is designed to constitute a stable FBG signal demodulation system. Experimental results show that hardware-optimized demodulation system and the data measured by multimeter can reach the expected target. The system resolution after demarcating can reach a 1 pm, dynamic state s measuring scope can reach 50 nm. (7 refs)

Main heading: Fiber Bragg gratings

Controlled terms: Optical filters

Uncontrolled terms: Amplification circuit - Signal demodulation - Tunable fiber Fabry-Perot(TFF-P) fiber

Classification Code: 717.2 Optical Communication Equipment - 741.3 Optical Devices and Systems

Treatment: Experimental (EXP)

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

22. Experimental study on control function of stabilized platform for rotary steering drilling tool

Tang, Nan (1); Huo, Aiqing (1); Wang, Yuelong (1); Cheng, Weibin (1)

Source: *Shiyou Xuebao/Acta Petrolei Sinica*, v 29, n 2, p 284-287, March 2008; **Language:** Chinese; **ISSN:** 02532697; **Publisher:** Science Press

Author affiliation: (1) Shaanxi Key Laboratory of Drilling Rigs Control Technique, Xi'an Shiyou University, Xi'an 710065, China

Abstract: For realizing fully rotary steering drilling in modulated drilling system, there should be a stabilized platform in the rotary steering drilling tool to regulate and maintain the angle of tool surface. A prototype of alignment-navigated stabilized platform was designed on the basis of the dual closed loop cascade systems for controlling angular velocity and position. Algorithm and control parameters for the platform were adjusted by the functional test of both the motor powered gear wheel driving and hydro-power driving with full velocity of water flow. When the generator rotate speed was from 500 r/min to 800 r/min and the rotate speed of lower valve plate was 60 r/min and frictional torque from 0.8 N·m to 7.5 N·m, the system step response time was about three seconds. Reliability and possibility of the system and control method were experimentally proved. (9 refs)

Main heading: Drilling platforms

Controlled terms: Angular velocity - Cascades (fluid mechanics) - Control systems - Oil well drilling - Oil well drilling equipment - Rotation

Uncontrolled terms: Drilling system - Navigational control system - Rotary steering drilling tool - Stabilized platform

Classification Code: 511.2 Oil Field Equipment - 512.1.2 Petroleum Deposits : Development Operations - 631.1 Fluid Flow, General - 731.1 Control Systems - 931.1 Mechanics

Treatment: Applications (APP)

Database: Compendex

Data Provider: Engineering Village

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23. Application of IVI-COM technology in EMC test software development

Jia, Huiqin ; Wei, Min ; Yan, Yan

Source: *Yi Qi Yi Biao Xue Bao/Chinese Journal of Scientific Instrument*, v 29, n 11, p 2346-2350, November 2008;

Language: Chinese; **ISSN:** 02543087; **Publisher:** Science Press

Author affiliation: (1) Xi'an Shiyou University, Xi'an 710065, China (2) Shaanxi Hi.-Technol. Electronic Corporation, Xi'an 710075, China

Abstract: EMC test software is used to realize instrument control methods and various data processing algorithms. Due to data processing algorithm is defined by related standards, so the core task of developing EMC test software is to design configuration strategy to improve the software universality and instrument interchangeability. This paper presents an instrument driving method based on IVI-COM technology, introduces the design method for instrument driving components and the development method under Visual C++ programming environment. An example is used to verify the availability based on IVI-COM technology to realize instrument interchangeability for EMC test. Experimental results show that when a new test item is added, there is no need to consider how to control the instrument; and instrument can be replaced by other one without having to modify EMC test software. So, the maintenance cost of the system is reduced, and user investment is protected. (9 refs)

Database: Compendex

Data Provider: Engineering Village

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24. Design on a new oil well test shock absorber under impact load

Wang, Yuanxun (1); Zhang, Peng (1); Cui, Zhijian (1, 2); Chen, Chuanyao (1)

Source: *Structural Engineering and Mechanics*, v 28, n 3, p 335-351, February 20, 2008; **ISSN:** 12254568; **DOI:**

10.12989/sem.2008.28.3.335; **Publisher:** Techno-Press

Author affiliation: (1) Huazhong University of Science and Technology, Wuhan, 430074, China (2) Xi'an Shiyou University, Xi'an, 710065, China

Abstract: Continuous operation of test and measurement is a new operating technique in the petroleum exploitation, which combines perforation with test and measurement effectively. In order to measure the original pressure of stratum layer exactly and prevent testing instrument from being impaired or damaged, a suitable shock absorber is urgently necessary to research. Based on the attempt on the FEM analysis and experiment research, a new shock absorber is designed and discussed in this paper. 3D finite element model is established and simulated accurately by LS-DYNA, the effect and the dynamic character of the shock absorber impact by half sinusoidal pulse force under the main lobe frequency are discussed both on theoretics and experiment. It is shown that the new designed shock absorber system has good capability of shock absorption for the impact load. (16 refs)

Main heading: Shock absorbers

Controlled terms: Finite element method - Impact strength - Mathematical models - Oil well testing

Uncontrolled terms: Absorption coefficient - Disturbing force - Impact load - Main lobe frequency - Shock absorption

Classification Code: 421 Strength of Building Materials; Mechanical Properties - 511.1 Oil Field Production

Operations - 601.2 Machine Components - 921.6 Numerical Methods

Treatment: Theoretical (THR)

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

25. The optimal design of TIR lens for improving LED illumination uniformity and efficiency

Zhen, Yankun (1); Jia, Zhenan (1); Zhang, Wenzhi (2)

Source: *Proceedings of SPIE - The International Society for Optical Engineering*, v 6834, 2008, *Optical Design and Testing III*; **ISSN:** 0277786X; **ISBN-13:** 9780819470096; **DOI:** 10.1117/12.756101; **Article number:** 68342K;

Conference: Optical Design and Testing III, November 12, 2007 - November 15, 2007; **Sponsor:** Society of Photo-Optical Instrumentation Engineers (SPIE); Chinese Optical Society (COS); **Publisher:** SPIE

Author affiliation: (1) School of Science, Xian Shiyou University, Xian 710065, China (2) State Key Laboratory of Modern Optical Instrumentation, Optical Engineering Department, Zhejiang University, Hangzhou 310027, China

Abstract: With the development of LED technology, LED will potentially replace the traditional light source for its cost and size advantages, especially in the micro-projection system. And since the illumination uniformity and efficiency on spatial light modulators (SLM) are two important factors in evaluating the performance of micro-projection system, tapered light pipe (TLP) and square compound parabolic concentrator (SCPC) are often used as beam shaper in LED-based micro projection system to provide SLM with uniform and efficient illumination. In this paper, in order to overcome the disadvantage of insufficient compactness induced by the working length of TLP or SCPC

for the illumination system, a total internal reflection (TIR) lens with rotated and faceted structure is designed with an optimization method to couple and transfer most of the light emitted from LED into a rectangular target plane (RTP) representing SLM. The TIR lens has six surfaces controlled by 17 dimensional parameters and is designed by optimization of dimensional parameters with generic algorithms. In order to provide RTP in fixed position with satisfied illumination uniformity and efficiency, the illumination uniformity and efficiency on RTP are taken into account in the merit function for the optimization process. In Tracepro program, the simulation result of the LED illumination system with the optimized TIR lens shows that the illumination efficiency and uniformity has respectively achieved to 61.9%, 76% with considering the limitation angle of light (15°). (8 refs)

Main heading: Optical instrument lenses

Controlled terms: Computer simulation - Cost effectiveness - Light emitting diodes - Optimization - Parameter estimation

Uncontrolled terms: Rectangular target plane (RTP) - Square compound parabolic concentrator (SCPC) - Tapered light pipe (TLP)

Classification Code: 714.2 Semiconductor Devices and Integrated Circuits - 723.5 Computer Applications - 731.1 Control Systems - 741.3 Optical Devices and Systems - 911.2 Industrial Economics - 921.5 Optimization Techniques

Treatment: Theoretical (THR)

Database: Compendex

Data Provider: Engineering Village

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26. A novel blind source separation algorithm based on projected natural gradient

Ye, Jimin (1); Jin, Haihong (2)

Source: *Proceedings - 1st International Congress on Image and Signal Processing, CISP 2008*, v 1, p 70-74, 2008, *Proceedings - 1st International Congress on Image and Signal Processing, CISP 2008*; **ISBN-13:** 9780769531199;

DOI: 10.1109/CISP.2008.565; **Article number:** 4566121; **Conference:** 1st International Congress on Image and Signal Processing, CISP 2008, May 27, 2008 - May 30, 2008; **Publisher:** IEEE Computer Society

Author affiliation: (1) School of Science, Xidian University, Xi'an 710071, China (2) School of Science, Xi'an Shiyou University, Xi'an 710065, China

Abstract: The behavior of over-determined blind source separation(ODBSS) algorithm with unknown number of sources, proposed by Cichocki et al. is analyzed. It is found it is the redundant movement of demixing matrix among an equivalent class that causes the divergence of the algorithm. We cancel the redundant component among natural gradient, which corresponding to the redundant movement of the demixing matrix, in an orthogonal projection approach, such that the projected nature gradient is orthogonal to the equivalent class mentioned above. For being free of redundant movement, the proposed projected natural gradient algorithm will converge stably. A practical redundancy detection method based on separating matrix is proposed. By embedding it into algorithm, the redundant outputs can be canceled simultaneously in separation process. Simulations show the proposed novel algorithm can perform the ODBSS with unknown and dynamically changing source number successfully and converge stably without redundant outputs. What's more, as some sources are added (removed), the algorithm need not be restarted, the separated sources will be hold in the original channels, only the add sources will appear in another channels (the removed sources will disappear). © 2008 IEEE. (10 refs)

Main heading: Blind source separation

Controlled terms: Matrix algebra

Uncontrolled terms: Detection methods - Natural gradient - Natural gradient algorithm - Number of sources - Orthogonal projection - Orthogonal projection approaches - Projected gradient - Separation process

Classification Code: 921.1 Algebra

Database: Compendex

Data Provider: Engineering Village

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27. Origin and characteristics of oil pool sequence in Ordos Basin

Wu, Fuli (1); Wang, Bianyang (1); Zhao, Jingzhou (1); Liu, Haibo (2); Li, Guangtao (1); Chen, Mingqi (1)

Source: *Shiyou Xuebao/Acta Petrolei Sinica*, v 29, n 5, p 639-642, September 2008; **Language:** Chinese; **ISSN:** 02532697; **Publisher:** Science Press

Author affiliation: (1) School of Petroleum Resources, Xi'an Shiyou University, Xi'an 710065, China (2) Yanchang Oilfield Co. Ltd., Yanchuan 717208, China

Abstract: The Mesozoic Ordos Basin developed the special oil pool sequence, which contains lithologic oil pool, lithologic-structural combination oil pool and structural oil pool from down to up. The comprehensive analyses on the different type of reservoir-forming condition and exploration status showed that the formation of oil pool sequence

was controlled by many factors including source rock, oil-gas migration, and reservoir-cap rock combination. The source rock is the main controlling factor for generation of oil pool sequence. The vertical distance between trap and source rock is the vital index, which determines oil source condition. The quality of cap rock has significance for oil pool sequence. (17 refs)

Main heading: Lakes

Controlled terms: Metamorphic rocks - Petroleum reservoir engineering

Uncontrolled terms: Cap rock - Key controlling factors - Oil pool type - Oil source condition - Ordos Basin

Classification Code: 512.1.2 Petroleum Deposits : Development Operations

Database: Compendex

Data Provider: Engineering Village

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28. Numerical simulation of convection heat exchange characteristics of two types of internally-finned tubes

Wu, Feng ; Deng, Zhi-An ; Chen, Jun-Bin ; He, Guang-Yu

Source: *Reneng Dongli Gongcheng/Journal of Engineering for Thermal Energy and Power*, v 23, n 5, p 527-530, September 2008; **Language:** Chinese; **ISSN:** 10012060; **Publisher:** Harbin Research Institute

Author affiliation: (1) Petroleum and Gas Storage and Transportation Engineering Department, College of Petroleum Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: With a laminar flow model and a turbulent flow model-based numerical simulation method being adopted and in combination with two kinds of boundary-condition treatment methods, a study has been conducted respectively of the flow and heat transfer performance of two types of longitudinally and internally finned tubes. During the study, a realizable $k-\varepsilon$ two equation model was used for the turbulent flow calculation. The numerical simulation results obtained from the two calculation models were compared with test results. It has been found that the simulation results obtained from the turbulent flow model are closer to the test values than those obtained from the laminar flow model. In the meanwhile, it has also been found that the critical Reynolds Number for the flow in both internally finned tubes when developing from a laminar flow to a turbulent one is far less than that for the traditional bare tube. In the light of the simulation results obtained from the turbulent flow model, correlation formulae were obtained through a fitting for the two types of internally finned tubes of $Nu-Re$ and $f-Re$ respectively, thus extending the applicable scope of the test data. Through a field synergy principle, a contrast analysis of intensified heat exchange mechanism for both types of internally-finned tubes was quantitatively conducted. The results of the study show that the field synergy degree of longitudinally-ridged and internally-finned tubes is better than that of longitudinally flat-finned tubes, thereby playing a role of intensified heat transfer. (20 refs)

Database: Compendex

Data Provider: Engineering Village

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29. Distribution characteristic of scattering field for an ellipsoidal target irradiated by an electromagnetic wave from an arbitrary direction

Li, Ying-Le (1); Huang, Ji-Ying (2); Wang, Ming-Jun (1); Zhang, Jia-Tian (3)

Source: *Chinese Physics B*, v 17, n 9, p 3394-3401, September 1, 2008; **ISSN:** 16741056; **DOI:** 10.1088/1674-1056/17/9/041; **Publisher:** Institute of Physics Publishing

Author affiliation: (1) Institute of Electromagnetic Wave Propagation and Scattering, Xianyang Normal University, Xianyang 712000, China (2) School of Science, Xidian University, Xian 710071, China (3) School of Electric Engineering, Xian Shiyou University, Xian 710071, China

Abstract: It is of great importance for engineering applications to obtain the expression of scattering field for an ellipsoidal target irradiated by an electromagnetic wave from an arbitrary direction. Literature relevant to this problem is seldom found. In this paper, the scattering field for an ellipsoidal target is presented by utilizing the scale transformation of electromagnetic field and the rotation of coordinate system, with an electromagnetic wave projecting on the target from an arbitrary direction. The obtained result is in good agreement with the solution available from the literature if we consider the scale factors to be unity. Taking a conducting ellipsoidal target for sample, we perform the partial simulations of the ellipsoidal model and a plant leaf model by choosing different scale factors. The obtained results show that the distribution characteristic of scattering field is sensitively affected by the polarization of the incident wave and varies not much with the incident wave angle but changes with the observation point. At some points the scattering energy arrives at its maximum. © 2008 Chin. Phys. Soc. and IOP Publishing Ltd. (23 refs)

Main heading: Electromagnetic waves

Controlled terms: Electromagnetic wave polarization - Electromagnetic fields - Electromagnetic wave scattering - Circular waveguides

Uncontrolled terms: Arbitrary incidence and polarization - Distribution characteristics - Ellipsoidal target - Engineering applications - Incident wave angles - Scale analysis - Scale transformation - Scattering characteristics
Classification Code: 701 Electricity and Magnetism - 711 Electromagnetic Waves - 714.3 Waveguides
Database: Compendex
Data Provider: Engineering Village
Compilation and indexing terms, Copyright 2023 Elsevier Inc.

30. Parameter sensitivity analysis of chaos in boost converter

Cheng, Weibin (1, 2); Fu, Zhongwei (1); Zhong, Yanru (2)

Source: *Jixie Gongcheng Xuebao/Chinese Journal of Mechanical Engineering*, v 44, n 4, p 246-252, April 2008;

Language: Chinese; **ISSN:** 05776686; **DOI:** 10.3901/JME.2008.04.246; **Publisher:** Editorial Office of Chinese Journal of Mechanical

Author affiliation: (1) College of Electronic Engineering, Xi'an Shiyou University, Xi'an 710065, China (2) College of Automation, Xi'an University of Technology, Xi'an 710048, China

Abstract: Boost converter is one of the most used DC/DC converters, in which there are more chaotic phenomena to make system work unsteadily. Based on the need to select the parameter to control chaos in Boost converters, the circuit model and discrete equations in continuous conduction mode are built, and working range is also deduced. The sensitivity of chaos behaviors to various kinds of parameters, such as current amplifying factor, input voltage, output voltage, boost inductance and switching period, are analyzed in detail with digital simulation and practical application, and then provide the design foundation for suppressing chaos with small parameter perturbation. (10 refs)

Main heading: DC-DC converters

Controlled terms: Chaos theory - Electric potential - Inductance - Sensitivity analysis

Uncontrolled terms: Boost converter - Boost inductance - Circuit model - Digital simulation - Discrete equations - Input voltage - Output voltage - Parameter perturbation - Switching period

Classification Code: 701.1 Electricity: Basic Concepts and Phenomena - 704.1 Electric Components - 921 Mathematics

Treatment: Applications (APP)

Database: Compendex

Data Provider: Engineering Village

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31. Stability of colloidal gas aphrons prepared solely by nonionic surfactant

Yan, Yong-Li ; He, Fei ; Zhang, Jia-Ming ; Qu, Cheng-Tun ; Zhang, Ning-Sheng

Source: *Gaodeng Xuexiao Huaxue Xuebao/Chemical Journal of Chinese Universities*, v 29, n 10, p 2044-2048, October 2008; **Language:** Chinese; **ISSN:** 02510790; **Publisher:** Higher Education Press

Author affiliation: (1) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an 710065, China (2) Shaanxi Yanchang Petroleum Co. Ltd., Yan'an 717208, China

Abstract: Stable colloidal gas aphrons (CGA) were prepared solely by polyoxymethylene-type nonionic surfactant (C12EO_n). Four different EO chain lengths namely C12EO₃, C12EO₅, C12EO₇ and C12EO₉ were considered. The microstructure and rheological properties on these colloidal systems were studied via optical microscopy and viscosimeter in attempt to explore the stability mechanisms. The experimental results suggest that CGA stabilized solely by C12EO₃ and C12EO₅ respectively exhibit the presence of lamellar liquid crystal adsorbed at the air/liquid interface, and could maintain more than 20 h without occurrence of collapse. In the case of CGA generated from C12EO₇ and C12EO₉, respectively, there is not any optical fine structure between two air bubbles and thus have a poor stability only for several minutes. It is concluded that the stability of CGA stabilized solely by C12EO_n surfactants is attributed to the presence of lamellar liquid crystalline phases located at the gas/liquid interface. The role of liquid crystal in stabilizing CGA could be explained in several mechanisms including hydrodynamic drainage, the mechanical strength of the liquid film and the diffusion rate of entrapped gas. (34 refs)

Database: Compendex

Data Provider: Engineering Village

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32. Fuzzy double-iterative method for steady-state optimization of the large-scale industrial process

Zhang, Yu-Hua (1, 2); Wan, Bai-Wu (1); Han, Chong-Zhao (1)

Source: *Kongzhi Lilun Yu Yingyong/Control Theory and Applications*, v 25, n 6, p 1032-1036, December 2008;

Language: Chinese; **ISSN:** 10008152; **Publisher:** South China University of Technology

Author affiliation: (1) School of Electronic and Information Engineering, Xi'an Jiaotong University, Xi'an 710049, China (2) School of Computer, Xi'an Shiyou University, Xi'an 710065, China

Abstract: Considering the model error of the real system, we propose a double-iterative method for steady-state optimizing control in the large-scale industrial process with fuzzy equality and inequality constraints. The sub-process models, being treated as the equality and the inequality constraints, are fuzzified by introducing to them fuzzy coefficients. The fuzzy double-iterative method is studied. Simulation results show that the solution of the proposed method is very close to the optimal solutions of the real process and provides a faster convergence than that of the exact double-iterative method. (8 refs)

Main heading: Iterative methods

Controlled terms: Constraint theory

Uncontrolled terms: Faster convergence - Fuzzy coefficients - Fuzzy inequality constrains - Inequality constraint - Large-scale industrial process - Optimal solutions - Steady-state optimization - Steady-state optimizing control

Classification Code: 921.6 Numerical Methods - 961 Systems Science

Database: Compendex

Data Provider: Engineering Village

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33. Effect of calcination temperature on catalytic activity of Cu-Ni-Ce/SiO₂ catalyst

Zhao, Binxia (1); Zhang, Xiaoli (1); Wang, Jin (2); Cao, Xin (1); Wang, Guanglei (1)

Source: *Huanjing Kexue Xuebao / Acta Scientiae Circumstantiae*, v 28, n 11, p 2305-2310, November 2008;

Language: Chinese; **ISSN:** 02532468; **Publisher:** Science Press

Author affiliation: (1) College of Chemical Engineering, Northwest University, Xi'an 710069, China (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: Cu-Ni-Ce/SiO₂ catalysts were prepared at different calcination temperatures by the impregnation method, and applied to the treatment of pesticide wastewater from imidacloprid production by catalytic wet hydrogen peroxide oxidation (CWPO). The catalysts were characterized by means of TG, BET, XRD and XPS. The relationships between the surface structure and catalytic activity and stability and the effect of calcination temperature (600, 700 and 800C) on catalytic activity and stability were studied. For the Cu-Ni-Ce/SiO₂ catalysts, an increase in the specific surface area and a decrease in particle size were obtained at lower calcination temperatures. Higher content of Cu-Ni oxide solid solution' and chemisorbed oxygen were present on the surface of Cu-Ni-Ce/SiO₂ catalyst when the calcination temperature was low. In CWPO of pesticide wastewater from imidacloprid production, the activity of catalyst was the highest for the catalyst calcined at 600C. By using the Cu-Ni-Ce/SiO₂ catalyst, about 91.5% COD_{Cr} removal was attained at a catalyst loading of 10 gL⁻¹, a temperature of 110C, influent pH 9, and reaction time of 60 min using the theoretical dosage of hydrogen peroxide. The concentration of leached Cu and Ni of catalyst was low. The strong interaction between CuO and NiO, CeO₂, copper-nickel solid solutions is closely related to the calcination temperature and affects the activity and stability of the Cu-Ni-Ce/SiO₂ catalyst in CWPO. (17 refs)

Main heading: Catalyst activity

Controlled terms: Particle size - Catalytic oxidation - Hydrogen peroxide - Nickel oxide - Organic pollutants - Wastewater treatment - Insecticides - Binary alloys - Cerium oxide - Copper oxides - Calcination - Solid solutions

Uncontrolled terms: Calcination temperature - Catalyst loadings - Catalytic wet hydrogen peroxide oxidations - Catalytic wet peroxide oxidation - Chemisorbed oxygen - Impregnation methods - Pesticide wastewater - Strong interaction

Classification Code: 451.2 Air Pollution Control - 452.4 Industrial Wastes Treatment and Disposal - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804 Chemical Products Generally - 804.1 Organic Compounds - 804.2 Inorganic Compounds - 933 Solid State Physics

Database: Compendex

Data Provider: Engineering Village

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34. A one-step network traffic prediction

Mu, Xiangyang (1); Tang, Nan (1); Gao, Weixin (1); Li, Lin (1); Zhou, Yatong (2)

Source: *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, v 5227 LNAI, p 616-621, 2008, *Advanced Intelligent Computing Theories and Applications: With Aspects of Artificial Intelligence - 4th International Conference on Intelligent Computing, ICIC 2008, Proceedings*; **ISSN:** 03029743, **E-ISSN:** 16113349; **ISBN-10:** 3540859837, **ISBN-13:** 9783540859833; **DOI:** 10.1007/978-3-540-85984-0_74; **Conference:** 4th International Conference on Intelligent Computing, ICIC 2008, September 15, 2008 - September 18, 2008; **Sponsor:** IEEE Computational Intelligence Society; International Neural Network Society; National Science Foundation of China; **Publisher:** Springer Verlag

Author affiliation: (1) School of Electrical Engineering, Xi'an Shiyu University, Xi'an 710065, China (2) School of Information Engineering, Hebei University of Technology, Tianjin 300401, China

Abstract: In the information society today computer networks are an indispensable part of people's life. Network traffic prediction is important to network planning, performance evaluation and network management directly. A variety of machine learning models such as artificial neural networks (ANN) and support vector machine (SVM) have been applied in traffic prediction. In this paper, a novel network traffic one-step-ahead prediction technique is proposed based on a state-of-the-art learning model called minimax probability machine (MPM). The predictive performance is tested on traffic data of Ethernet, experimental results show that the predictions of MPM match the actual traffics accurately and the proposed methods can increase the computational efficiency. Furthermore, we compare the MPM-based prediction technique with the SVM-based techniques. The results show that the predictive performance of MPM is competitive with SVM. © 2008 Springer-Verlag Berlin Heidelberg. (11 refs)

Main heading: Forecasting

Controlled terms: Neural networks - Computational efficiency - Support vector machines

Uncontrolled terms: Information society - Machine learning models - Minimax probability machine - Network traffic - Network traffic predictions - Prediction techniques - Predictive performance - Traffic prediction

Classification Code: 723 Computer Software, Data Handling and Applications

Database: Compendex

Data Provider: Engineering Village

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35. Establishment of inflow performance relationship of horizontal wells in low-permeability reservoir

Yao, Jun ; Liu, Shun ; Xu, Yuan-Gang

Source: *Zhongguo Shiyu Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)*, v 32, n 4, p 64-67+72, August 2008; **Language:** Chinese; **ISSN:** 16735005; **Publisher:** University of Petroleum, China

Author affiliation: (1) College of Petroleum Engineering, China University of Petroleum, Dongying 257061, China (2) College of Petroleum Engineering, Xi'an Shiyu University, Xi'an 710065, China

Abstract: The productivity equations in steady fluid flow and oil-gas two-phase flow with solution gas drive of horizontal wells in low-permeability reservoirs were established by equivalent flowing resistance method. And the dimensionless inflow performance relationship of horizontal wells was given. The equations of inflow performance relationship are simple and clear, and correspond with Wiggins equations. The results show that the flow in middle and high permeability reservoirs is only a special case of flow in low-permeability reservoirs when the starting pressure gradient equals to zero. The productivity for horizontal wells in low-permeability reservoirs decreases with the starting pressure gradient increasing. And the productivity for horizontal wells increases evidently with the length of horizontal well increasing. (11 refs)

Database: Compendex

Data Provider: Engineering Village

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36. A novel least squares support vector machine kernel for approximation

Mu, Xiangyang (1); Gao, Weixin (1); Tang, Nan (1); Zhou, Yatong (2)

Source: *Proceedings of the World Congress on Intelligent Control and Automation (WCICA)*, p 4510-4513, 2008, *Proceedings of the 7th World Congress on Intelligent Control and Automation, WCICA'08*; **ISBN-13:** 9781424421145;

DOI: 10.1109/WCICA.2008.4593650; **Article number:** 4593650; **Conference:** 7th World Congress on Intelligent Control and Automation, WCICA'08, June 25, 2008 - June 27, 2008; **Sponsor:** Chinese Association of Artificial Intelligence; Chinese Association of Automation; et al.; IEEE Control System Society Beijing Chapter; IEEE Robotics and Automation Society; Natural Science Foundation of China; **Publisher:** Institute of Electrical and Electronics Engineers Inc.

Author affiliation: (1) School of Electrical Engineering, Xi'an Shiyu University, Xi'an,710065, China (2) School of Information Engineering, Hebei University of Technology, Tianjin,300401, China

Abstract: The Support Vector Machine(SVM) is receiving considerable attention for its Superior ability to solve nonlinear classification, function estimation and density estimation. Least Squares Support Vector Machines (LS-SVM) are reformulations to the standard SVMs. Motivated by the theory of multi-scale representations of signals and wavelet transforms, this paper presents a way for building a wavelet-based reproducing kernel Hilbert spaces (RKHS) and its associate scaling kernel for least squares support vector machines (LSSVM). The RKHS built is a multiresolution scale subspace, and the scaling kernel is constructed by using a scaling function with its different dilations and translations. Compared to the traditional kernels, approximation results illustrate that the LSSVM with scaling kernel enjoys two

advantages: (1) it can approximate arbitrary signal and owns better approximation performance; (2) it can implement multi-scale approximation. © 2008 IEEE. (16 refs)

Main heading: Support vector machines

Controlled terms: Hilbert spaces - Least squares approximations - Vectors - Wavelet transforms - Vector spaces

Uncontrolled terms: Approximation - Approximation performance - Approximation results - Least squares support vector machines - Multiscale representations - Nonlinear classification - Reproducing Kernel Hilbert spaces - Scaling kernel

Classification Code: 723 Computer Software, Data Handling and Applications - 921 Mathematics - 921.1 Algebra - 921.3 Mathematical Transformations - 921.6 Numerical Methods

Database: Compendex

Data Provider: Engineering Village

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37. A study on the flow instability in evaporator of gravity separate type heat pipe

Zhu, Yuqin (1, 2); Bi, Qincheng (1); Chen, Tingkuan (1); Pu, Lin (1)

Source: *Microgravity Science and Technology*, v 20, n 3-4, p 281-285, September 2008; **ISSN:** 09380108; **DOI:**

10.1007/s12217-008-9021-8; **Publisher:** Springer Netherlands

Author affiliation: (1) State Key Laboratory of Multiphase Flow, Xi'an Jiaotong University, Xi'an 710049, China (2) School of Chemical Engineering, Xi'an Shiyu University, Xi'an 710065, China

Abstract: The flow characteristics and instability in the small inclination angle evaporator of Gravity Separate Type Heat Pipe (GSTHP) were studied. Flow patterns were investigated by a quartz glass tube with a $\phi_{25} \times 2$ mm in evaporator of GSTHP. Two types of flow instabilities occurred, which are the flow pattern transition instability and density wave instability. The effects on the flow instability, such as inlet subcooling, heat flux, pressure, and outlet throttle resistance, were determined in the modeling experiment within the following parameter ranges: the inlet subcooling $T_{sub} = 828\text{C}$, the heat flux $q = 1040 \text{ kW/m}^2$ and the throttle coefficient $K_i = 0.5075$. The limits of the flow pattern transition instability and the density wave instability were obtained. © 2008 Springer Science+Business Media B.V. (9 refs)

Main heading: Evaporators

Controlled terms: Flow patterns - Heat flux - Stability - Heat pipes - Heat resistance - Cooling

Uncontrolled terms: Flow characteristics - Flow instabilities - Flow pattern transition instability - Gravity separate type heat pipe - Inclination angles - Inlet sub-cooling - Model experiments - Parameter range

Classification Code: 619.1 Pipe, Piping and Pipelines - 631.1 Fluid Flow, General - 641.2 Heat Transfer - 802.1 Chemical Plants and Equipment

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Database: Compendex

Data Provider: Engineering Village

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38. H robust controller for electric bicycles

Haobin, Zhou (1, 2); Bo, Long (2); BingGang, Cao (2)

Source: *Proceedings - 2008 Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008*, p

131-135, 2008, *Proceedings - 2008 Workshop on Power Electronics and Intelligent Transportation System, PEITS*

2008; **ISBN-13:** 9780769533421; **DOI:** 10.1109/PEITS.2008.96; **Article number:** 4634830; **Conference:** 2008

Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008, August 4, 2008 - August 5, 2008;

Sponsor: 2008 Int. Symposiums on Electronic Commerce and Security (ISECS); et al.; Guangdong University of

Business Studies; IEEE Computer Society; IEEE SMC; Institute of Electrical and Electronics Engineers; **Publisher:**

IEEE Computer Society
Author affiliation: (1) Department of Material Science and Engineering, Xi'an Shiyu University, Xian 710065, China (2) School of Mechatronic Engineering, Xian JiaoTong University, Xian 710049, China
Abstract: The performance of electric bicycles is largely determined by their electric controllers, which is regarded as a core component in the whole system. We use the robust control theory to design a H# robust controller for the current loop in the closed speed-current dual-loop system. Furthermore, we use the H# robust controller to design an energy recovery controlling system based on the driving and energy regenerating circuit topology for widely used electric bicycles. Experiments and simulations show that the H# robust controller out-performs the traditional PID controller in many respects including stability, error, response speed and driving distance per battery charge. © 2008 IEEE. (17 refs)

Main heading: Controllers

Controlled terms: Bicycles - Closed loop systems - Robust control - Three term control systems - Electric vehicles

Uncontrolled terms: Controlling system - Core components - Driving distance - Electric bicycles - Energy recovery - PID controllers - Response speed - Robust controllers

Classification Code: 432.2 Passenger Highway Transportation - 731 Automatic Control Principles and Applications - 731.1 Control Systems - 732.1 Control Equipment - 961 Systems Science

Database: Compendex

Data Provider: Engineering Village

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39. Interaction between collinear periodic cracks in an infinite piezoelectric body

Cui, Zhi-Jian (1, 2); Hu, Hong-Ping (2); Yang, Feng (2)

Source: *Applied Mathematics and Mechanics (English Edition)*, v 29, n 7, p 863-870, July 2008; **ISSN:** 02534827;

DOI: 10.1007/s10483-008-0704-x; **Publisher:** Springer Netherlands

Author affiliation: (1) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an 710065, China (2) Department of Mechanics, Huazhong University of Science and Technology, Wuhan 430074, China

Abstract: The problem of collinear periodic cracks in an infinite piezoelectric body is studied. Effect of saturation strips at the crack-tips is taken into account. By means of the Stroh formalism and the conformal mapping technique, the general periodic solutions for collinear cracks are obtained. The stress intensity factors and the size of saturation strips are derived analytically, and their dependencies on the ratio of the periodicity on the half-length of the crack are analyzed in detail. Numerical results show the following two facts. (1) When $h/l > 4.0$, the stress intensity factors become almost identical to those of a single crack in an infinite piezoelectric body. This indicates that the interaction between cracks can be ignored in establishing the criterion for the crack initiation in this case. (2) The speed of the saturation strip size of periodic cracks approaching that of a single crack depends on the electric load applied at infinity. In general, a large electric load at infinity is associated with a slow approaching speed. © 2008 Shanghai University and Springer-Verlag GmbH. (19 refs)

Main heading: Stress intensity factors

Controlled terms: Conformal mapping - Crack tips - Piezoelectricity

Uncontrolled terms: Approaching speed - Collinear cracks - Conformal mapping technique - Length of crack - Numerical results - Periodic cracks - Periodic solution - Stroh formalism

Classification Code: 701.1 Electricity: Basic Concepts and Phenomena

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Funding text: * Received Jul. 9, 2007 / Revised Jun. 11, 2008 Project supported by the Postdoctoral Science Foundation of China (No. 20070410944) Corresponding author HU Hong-ping, Doctor, E-mail: hhp0066@163.com

Database: Compendex

Data Provider: Engineering Village

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40. Vector control system of induction motor based on fuzzy control method

HaoBin, Zhou (1, 2); Bo, Long (2); BingGang, Cao (2)

Source: *Proceedings - 2008 Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008*, p 136-139, 2008, *Proceedings - 2008 Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008*; **ISBN-13:** 9780769533421; **DOI:** 10.1109/PEITS.2008.110; **Article number:** 4634831; **Conference:** 2008

Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008, August 4, 2008 - August 5, 2008;

Sponsor: 2008 Int. Symposiums on Electronic Commerce and Security (ISECS); et al.; Guangdong University of Business Studies; IEEE Computer Society; IEEE SMC; Institute of Electrical and Electronics Engineers; **Publisher:** IEEE Computer Society

Author affiliation: (1) Department of Material Science and Engineering, Xi'an Shiyou University, Xi'an 710065, China (2) School of Mechatronic Engineering, Xi'an JiaoTong University, Xi'an 710049, China

Abstract: Aiming at non-linear model of multivariable induction motor, traditional PI method is hard to achieve satisfactory control purpose. Fuzzy control can carry the real-time control on system without the accurate mathematical model of induction motor. This paper elaborates induction motor vector control system and the basic principle of the fuzzy PI, making use of fuzzy reasoning, automatically adjusting the controller's parameters. Simulation results prove that fuzzy PI controller is superior to traditional PI controller in the aspect of response speed, steady state accuracy and disturbance attenuation. © 2008 IEEE. (10 refs)

Main heading: Fuzzy control

Controlled terms: Induction motors - Controllers - Vector control (Electric machinery) - Real time control - Water craft

Uncontrolled terms: Adjustment parameter - Basic principles - Disturbance attenuation - Fuzzy control methods - Fuzzy-PI controllers - Non-linear model - Satisfactory control - Steady state accuracy

Classification Code: 674.1 Small Marine Craft - 705.3.1 AC Motors - 731 Automatic Control Principles and Applications - 731.2 Control System Applications - 732.1 Control Equipment

Database: Compendex

Data Provider: Engineering Village

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41. Design and implementation of Web Services based on distributed system of reservoir modeling

Wang, Xiang-Bo ; Wang, Jia-Hua ; Huang, Ben-Yu ; Cao, Chun-Xiang

Source: *Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)*, v 32, n 4, p 152-156+160, August 2008; **Language:** Chinese; **ISSN:** 16735005; **Publisher:** University of Petroleum, China

Author affiliation: (1) School of Computer Science, Xi'an Shiyou University, Xi'an 710065, China (2) School of Business Administration, Capital University of Business and Economics, Beijing 100026, China

Abstract: To offset the lack in processing a great deal of data and data sharing between the isomeric systems of the single machine systems of reservoir modeling software widely used, a distributed system of reservoir modeling (DSRM) was presented with the architecture design, the business process logic (BPL) design, the function design of each process unit and the complementary model of the system based on Web Services technology. (11 refs)

Database: Compendex

Data Provider: Engineering Village

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42. Micro-analysis of interfacial reaction diffusion in Ti matrix composite

Lu, Xiang-Hong (1); Yang, Yan-Qing (2)

Source: *Cailiao Gongcheng/Journal of Materials Engineering*, n 6, p 21-24+28, June 2008; **Language:** Chinese; **ISSN:** 10014381; **Publisher:** Beijing Institute of Aeronautical Materials (BIAM)

Author affiliation: (1) School of Material Science and Engineering, Xi'an Shiyou University, Xi'an 710065, China (2) School of Materials Science and Engineering, Northwestern Polytechnical University, Xi'an 710072, China

Abstract: SiC continuous fiber-reinforced Ti matrix composites were fabricated and then heat-treated in vacuum under different conditions. The interfacial reaction and the formation of interfacial phases were studied by using of TEM, SEM, EDS and XRD methods. The results showed that there exists reaction diffusion at the interface of SiC fibers and Ti matrix, and the content fluctuation of reactive elements such as C, Ti and Si appears in interfacial reaction layers. The interfacial reaction products are identified as Ti₃SiC₂, TiC and Ti₅Si₃. Ti₃SiC₂ and Ti₅Si₃ single-phase zones come forth in turn adjacent to SiC fibers, and Ti₅Si₃ single-phase zone appears adjacent to Ti side, between which is TiC + Ti₅Si₃ double-phase zone. The formed interfacial phase sequences is to be SiC|Ti₃SiC₂|Ti₅Si₃|TiC + Ti₅Si₃|Ti from SiC fiber to Ti matrix. (11 refs)

Main heading: Silicon carbide

Controlled terms: Diffusion in liquids - Titanium - Fibers - Titanium carbide - Diffusion in solids

Uncontrolled terms: Continuous fibers - Interfacial phase - Interfacial reaction layer - Reaction diffusion - Reactive elements - SiC fibers - Single phase - Ti-matrix composites

Classification Code: 542.3 Titanium and Alloys - 804.2 Inorganic Compounds

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

43. Design of the target type flowmeter based on fiber Bragg grating and experiment

Qiao, Xueguang (1); Zhang, Qian (1, 2); Fu, Haiwei (1); Yu, Dakuan (1)

Source: *Chinese Optics Letters*, v 6, n 11, p 815-817, November 2008; **ISSN:** 16717694; **DOI:** 10.3788/COL20080611.0815; **Publisher:** Science Press

Author affiliation: (1) Key Laboratory of Photoelectric Gas-Oil Logging and Detecting, Xi'an Shiyou University, Xi'an 710065, China (2) Changqing Oilfield Company Communications Corporation, PetroChina, Xi'an 710018, China

Abstract: The target type flowmeter based on fiber Bragg gratings (FBGs) is experimentally studied. The relationship between the central wavelength shift of FBG and the flux is derived and the analytic expression is also given. Simulation and preliminary experiments have been carried out, and experimental validation of the water further proves

the feasibility of the sensor. The experimental results verify the proposed sensor which can measure flux range from 200 to 1200 cm³/s. And on this basis, the improvement program is raised. © 2008 Chinese Optics Letters. (11 refs)

Main heading: Fiber Bragg gratings

Controlled terms: Flow measurement - Flowmeters

Uncontrolled terms: Analytic expressions - Central wavelength - Experimental validations - Fiber Bragg gratings (FBGs) - Flux ranges - Target type

Classification Code: 631.1 Fluid Flow, General - 943.1 Mechanical Instruments - 943.2 Mechanical Variables Measurements

Database: Compendex

Data Provider: Engineering Village

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44. Stabilization of foams solely with polyoxyethylene-type nonionic surfactant

Chen, Zong-Lin (1); Yan, Yong-Li (2); Huang, Xue-Bin (1)

Source: *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, v 331, n 3, p 239-244, December 31, 2008; **ISSN:** 09277757; **DOI:** 10.1016/j.colsurfa.2008.08.011; **Publisher:** Elsevier

Author affiliation: (1) School of Material Science and Engineering, Xi'an Jiaotong University, Xi'an, 710049, China (2) College of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an, 710065, China

Abstract: Long-term stability is desirable for many foam-based systems, but achieving it is rather difficult. We report how foams can be stabilized solely with nonionic surfactant of the polyoxyethylene dodecyl ether (C12EO_n). Effects of concentration and EO chain length of surfactants namely C12EO₃, C12EO₅, C12EO₇ and C12EO₉ on foaming properties (foamability and foam stability) were considered. The liquid drainage profiles of foams prepared were determined by reading the volume of the liquid drained as a function of time. The microstructure and viscosities on these colloidal systems were studied using optical microscopy and viscosimeter in attempt to explore the stability mechanisms. The experimental results suggest that the foamability goes through a maximum at the concentration of 10 wt.%, respectively, except for C12EO₇. The optimal concentration of C12EO₇ displaying maximum foaming capacity is at 1 wt.%. The stability of foams increases with increment of surfactant concentration. Foams stabilized solely by C12EO₃ and C12EO₅ at the concentration of 30 wt.%, respectively, exhibit the presence of lamellar liquid crystal adsorbed at the air/liquid interface, and could maintain more than 20 h without occurrence of collapse. In the case of foams generated from C12EO₇ and C12EO₉ under same concentration, respectively, there is no any optical fine structure between two air bubbles and thus has a poor stability only for tens of minutes. It is concluded that the stability of foams stabilized solely by C12EO_n surface active agents is attributed to the presence of lamellar liquid crystalline phases located at the gas/liquid interface. The role of liquid crystal in stabilizing foams could be explained in several mechanisms including hydrodynamic drainage, the mechanical strength of the liquid film and the diffusion rate of entrapped gas. The drainage behavior from these foams was well fitted by the empirical equation $V_t = V_{max}t^n / (K_n + t^n)$ and the mechanism of liquid drainage was also discussed. © 2008 Elsevier B.V. All rights reserved. (35 refs)

Main heading: Nonionic surfactants

Controlled terms: Liquid films - Stabilization - Polyethylene oxides - Ethers - Phase interfaces - System stability - Liquid crystals

Uncontrolled terms: Gas/liquid interface - Lamellar liquid crystal - Liquid crystalline phase - Liquid drainage - Liquid-crystalline phasis - Optimal concentration - Polyoxyethylene dodecyl ethers - Surfactant concentrations

Classification Code: 801.4 Physical Chemistry - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 815.1.1 Organic Polymers - 961 Systems Science

Funding Details: Number: 07JK367, Acronym: -, Sponsor: -, Number: 20060400299, Acronym: -, Sponsor: China Postdoctoral Science Foundation;

Funding text: This project has been financially supported by China Postdoctoral Science Foundation Funded Project (No. 20060400299) and Shaanxi Province Science & Technology Research Program (No. 07JK367).

Database: Compendex

Data Provider: Engineering Village

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45. Study on voltage stability of distribution networks

Xiaomeng, Wu (1, 3); Liu, Jian (2); Suli, Yan (3)

Source: *Proceedings - 2008 Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008*, p 399-403, 2008, *Proceedings - 2008 Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008*; **ISBN-13:** 9780769533421; **DOI:** 10.1109/PEITS.2008.111; **Article number:** 4634884; **Conference:** 2008

Workshop on Power Electronics and Intelligent Transportation System, PEITS 2008, August 4, 2008 - August 5, 2008;

Sponsor: 2008 Int. Symposiums on Electronic Commerce and Security (ISECS); et al.; Guangdong University of

Business Studies; IEEE Computer Society; IEEE SMC; Institute of Electrical and Electronics Engineers; **Publisher:** IEEE Computer Society

Author affiliation: (1) Xi'an University of Technology, Shaanxi, Xi'an, 710048, China (2) Xi'an University of Science and Technology, Xi'an, 710054, China (3) Xi'an Shiyou University, Xi'an, Shaanxi, 710065, China

Abstract: A new criterion of voltage stability for distribution network is deduced based on the existence of solution of power flow, i.e., the first class criterion. The profile of load is included in the proposed criterion. The weakness of the existing criterion based on load-voltage property, i.e., the second class criterion, is described. It is pointed that the first class criterion is the necessary condition of voltage stability but not the sufficient condition. To guarantee voltage stability, both the first and the second class criterion must be satisfied. The indexes of voltage stability margin and safe distance are defined. The proposed method is demonstrated by an example showing its feasibility. It is also shown that the proposed indexes can evaluate the voltage stability and the tolerance of disturbance. © 2008 IEEE. (19 refs)

Main heading: Electric load flow

Controlled terms: Stability - Electric power distribution

Uncontrolled terms: Existence of Solutions - Load voltages - Power flows - Safe distance - Second class - Voltage stability margins

Classification Code: 706.1 Electric Power Systems - 706.1.2 Electric Power Distribution

Database: Compendex

Data Provider: Engineering Village

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46. Study of a high-temperature and high-pressure FBG sensor with Al₂O₃ thin-wall tube substrate

Zhou, Hong (1); Qiao, Xue-Guang (1); Wang, Hong-Liang (1); Feng, De-Quan (1); Wang, Wei (1)

Source: *Optoelectronics Letters*, v 4, n 4, p 260-263, July 2008; **ISSN:** 16731905; **DOI:** 10.1007/s11801-008-7151-2;

Publisher: Springer Verlag

Author affiliation: (1) Optical Fiber Sensing Laboratory, Xi'an Petroleum University, Xi'an 710065, China

Abstract: A fiber Bragg grating (FBG) high-temperature and high pressure sensor has been designed and fabricated by using the Al₂O₃ thin-wall tube as a substrate. The test results show that the sensor can withstand a pressure range of 0-45 MPa and a temperature range of -10-300 °C, and has a pressure sensitivity of 0.0426 nm/MPa and a temperature sensitivity of 0.0112 nm/°C © 2008 Tianjin University of Technology and Springer-Verlag GmbH. (8 refs)

Main heading: Fiber Bragg gratings

Controlled terms: Aluminum oxide - Alumina - Thin walled structures

Uncontrolled terms: FBG sensor - High temperature and high pressure - Pressure ranges - Pressure sensitivities - Temperature range - Temperature sensitivity - Thin-wall tube

Classification Code: 804.2 Inorganic Compounds

Funding Details: Number: 2002AA313150, Acronym: -, Sponsor: -;

Funding text: * This work has been supported by the National "863" Project of China (No.2002AA313150). ** E-mail: hongzhouteacher@yahoo.com.cn

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

47. Fast decoupled method applying on distribution load flow calculation

Lou, Zhi-Hui (1); Dong, Zhang-Zhuo (2)

Source: *Zhongguo Dianji Gongcheng Xuebao/Proceedings of the Chinese Society of Electrical Engineering*, v 28, n SUPPL., p 41-46, December 2008; **Language:** Chinese; **ISSN:** 02588013; **Publisher:** Chinese Society for Electrical Engineering

Author affiliation: (1) College of Electric and Control Engineering, Xi'an University of Science and Technology, Xi'an 710054, China (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: In general, the fast decoupled method is not good in convergence in distribution load flow calculation. By summarizing the theories of the decoupled method and the BX method, the paper makes sure that the decoupled method is fit for the distribution load flow calculation and the resistance don't need to be much less than reactance. Based on this, the convergence criterion is presented by condition number of Jacobian matrix and norm of the solution of power flow. The example proves that BX method can also be better in convergence when the resistance is larger than reactance in distribution power system. (15 refs)

Main heading: Jacobian matrices

Controlled terms: Electric load flow - Number theory

Uncontrolled terms: Condition numbers - Convergence - Convergence criterion - Convergence in distribution - Decoupled methods - Distribution load flow - Distribution power systems - Fast-decoupled method

Classification Code: 706.1 Electric Power Systems - 921.1 Algebra

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

48. Adsorption kinetics of *Dioscorea zingiberensis* yellow pigment on the macroporous resins

Li, Wenhong (1); Tang, Xuan (2); Li, Xinsheng (3); Chen, Dejing (3); Li, Dong (1); Han, Feng (1); Li, Xuekun (1)

Source: *Lizi Jiaohuan Yu Xifu/Ion Exchange and Adsorption*, v 24, n 6, p 526-534, December 2008; **Language:**

Chinese; **ISSN:** 10015493; **Publisher:** Tianjin Nankai Daxue

Author affiliation: (1) College of Chemical Engineering, Northwest University, Xi'an 710069, China (2) Xi'an Shiyou University, Xi'an 710065, China (3) Bioresources Key Laboratory of Shanxi, Shanxi Technology University, Hanzhong 723000, China

Abstract: Eight types of macroporous resin were selected to compare their performances in adsorbing and desorbing yellow pigment extracted from *Dioscorea zingiberensis*. LX-18G macroporous adsorption resin in aqueous solution was investigated in batch experiments. The data obtained from kinetic and isotherm experiments could be well described using pseudo-second-order rate model and Langmuir isotherm model respectively, high temperature and concentrated solution were benefit to adsorption, the activation energy was 5.37kJ/mol. The adsorption process was controlled by film diffusion at earlier stages and by intra particle diffusion at later stages. (10 refs)

Database: Compendex

Data Provider: Engineering Village

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49. Investigation of FBG sensor of light-walls conduit made of sapphire

Zhou, Hong (1); Qiao, Xue-Guang (1); Wang, Hong-Liang (1); Feng, De-Quan (1); Wang, Wei (1)

Source: *Guangdianzi Jiguang/Journal of Optoelectronics Laser*, v 19, n 1, p 17-20, January 2008; **Language:**

Chinese; **ISSN:** 10050086; **Publisher:** Board of Optronics Lasers

Author affiliation: (1) Laboratory of Optical Fiber Sensing, Xi'an Petroleum University, Xi'an 710065, China

Abstract: The conduit model of sapphire is designed by finite element analysis. In this way, when the conduit receives external pressure, the relation between the stress and strain was analyzed. A FBG sensor with the test range of 0-45 MPa, -10-300°C and the sensitivities of 0.0426 nm/MPa, 0.0112 nm/°C was designed and fabricated. The testing results show the finite element analysis are completely accord with the experiments. (8 refs)

Main heading: Fiber optic sensors

Controlled terms: Fiber Bragg gratings - Finite element method - Sapphire - Strain

Uncontrolled terms: Fiber Bragg grating (FBG) sensing - Finite element analysis - Sensitivity - Stress

Classification Code: 732.2 Control Instrumentation - 741.1.2 Fiber Optics - 741.3 Optical Devices and Systems - 921.6 Numerical Methods

Treatment: Experimental (EXP)

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

50. Experimental study on steam-liquid distribution characteristics of intermediate headers of the once-through boiler with variable pressure operation

Zhu, Yu-Qin (1); Bi, Qin-Cheng (2); Chen, Ting-Kuan (2); Li, Ya-Hong (1)

Source: *Dongli Gongcheng/Power Engineering*, v 28, n 6, p 834-838, December 2008; **Language:** Chinese; **ISSN:**

10006761; **Publisher:** Shanghai Power Equipment Research Institute

Author affiliation: (1) Technology Research Center of Petroleum Refinery Engineering, Xi'an Shiyou University, Xi'an 710065, China (2) National Key Lab of Power Engineering Multiphase Flow, Xi'an Jiaotong University, Xi'an 710049, China

Abstract: The distribution characteristics of steam-liquid two-phase flow in the intermediate headers of the supercritical one-through boiler were simulated under the condition of 35%, 50% and 75% ECR with variable pressure operation based on an air-water test circuit. The volumetric fractions of air content and flow rate in each branch were measured by use of the quick-close valve method and frictional resistance method respectively. Test results show that the air fraction distribution in the parallel branch is the most uniform under 35% ECR when the inlet dryness x is in the range

of 0.7-0.95. With the increase of load, the deviation of phase distribution among branches increases, and the uniformity of flow distribution also increases. (8 refs)

Database: Compendex

Data Provider: Engineering Village

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51. Synthesis of composite material CdS/Al-HMS and hydrogen production by photocatalytic pollutant degradation under visible light irradiation

Zhang, Yao-Jun (1); Zhang, Li (2)

Source: *Wuji Cailiao Xuebao/Journal of Inorganic Materials*, v 23, n 1, p 66-70, January 2008; **Language:** Chinese;

ISSN: 1000324X; **DOI:** 10.3724/SP.J.1077.2008.00066; **Publisher:** Science Press

Author affiliation: (1) School of Material Science and Engineering, Xi'an University of Architecture and Technology, Xi'an 710055, China (2) School of Chemistry and Chemical Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: A series of photocatalytically composite materials, CdS/Al-HMS and Pt/CdS/Al-HMS, were prepared by template reagent, ion exchange, precipitation and impregnation methods. The photo-catalysts were characterized by using X-ray diffraction (XRD), transmission electron microscope (TEM), X-ray fluorescence analysis (XRF), UV-Visible diffuse reflectance spectrum technology. The results show that the structure of the composite material CdS/Al-HMS mainly depends on the amount of CdS in Al-HMS. The doping composite material is formed with low content of CdS and the nanoscale composite material is produced with high content of CdS. The photocatalytic activities of hydrogen productions for coupled materials are carried out by photocatalytic formic acid degradation under visible light irradiation ($\lambda \geq 420$ nm). The result indicates that the composite material loaded 6% Pt shows the highest hydrogen generation rate of 22.3mL/h with an apparent quantum yield of 12% at the wavelength of 420 nm. (12 refs)

Main heading: Photocatalysts

Controlled terms: Composite materials - Doping (additives) - Formic acid - Hydrogen production - Impregnation - Ion exchange - Organic pollutants - Precipitation (chemical) - Quantum yield - Synthesis (chemical) - Transmission electron microscopy - X ray diffraction analysis

Uncontrolled terms: Photocatalytic pollutant degradation - Visible light irradiation - X ray fluorescence analysis (XRF)

Classification Code: 801 Chemistry - 802.2 Chemical Reactions - 802.3 Chemical Operations - 803 Chemical Agents and Basic Industrial Chemicals - 804.1 Organic Compounds - 931.3 Atomic and Molecular Physics

Treatment: Experimental (EXP)

Database: Compendex

Data Provider: Engineering Village

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52. Study on leading tunnel reflection seismic prediction

Shen, Hong-Yan (1, 2); Li, Qing-Chun (1); Feng, Hong (1, 3); Zhang, Peng (3); Shao, Guang-Zhou (1)

Source: *Tiedao Xuebao/Journal of the China Railway Society*, v 30, n 6, p 75-81, December 2008; **Language:**

Chinese; **ISSN:** 10018360; **Publisher:** Science Press

Author affiliation: (1) School of Geologic Engineering and Geometrics, Chang'an University, Xi'an 710054, China (2) School of Petroleum Resources, Xi'an Shiyou University, Xi'an 710065, China (3) Xi'an Branch, China Coal Research Institute, Xi'an 710054, China

Abstract: The leading seismic predication for tunnels is to predict by some means or methods the locations, characters and scales of unfavorable geological bodies or their boundaries in underground engineering construction and so to provide reliable basis for countermeasures to guarantee safe, quick and continuous construction. This paper discusses the basic principles of the leading tunnel reflection seismic predication (TRSP), analyzes the characters of wave propagation, studies the optimum geometry system and summarizes the time-distance relations law of TRSP. A special data processing system named TRSP1.0 was developed, which includes function modules for wave form processing, forward numerical modeling targets imaging and extracting of lithologic parameters. Synthetic and real data have testified that good results may be acquired with this TRSP1.0. (16 refs)

Main heading: Forecasting

Controlled terms: Wave propagation - Data handling - Seismic waves - Seismic response - Lithology

Uncontrolled terms: Basic principles - Data processing systems - Optimum geometry - Reflection seismic - Seismic predictions - Synthetic and real data - Underground engineering - Unfavorable geological bodies

Classification Code: 481.1 Geology - 484 Seismology - 484.2 Secondary Earthquake Effects - 723.2 Data Processing and Image Processing

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, Copyright 2023 Elsevier Inc.

53. Technique of multi-pulse gas load fracturing (Open Access)

Pu, Chun-Sheng (1, 2); Sun, Zhi-Yu (1); Wang, Xiang-Zeng (1); Luo, Ming-Liang (1)

Source: *Shiyou Kantan Yu Kaifa/Petroleum Exploration and Development*, v 35, n 5, p 636-639, October 2008;

Language: Chinese; **ISSN:** 10000747; **Publisher:** Science Press

Author affiliation: (1) China University of Petroleum, Dongying 257061, China (2) Xi'an Petroleum University, Xi'an 710065, China

Abstract: In de-stressing and fracturing formation with multi-pulse gas loading, the pressure gradient of deflagration gas along cracks affects crack initiation and extension. The overlay principle is used to resolve complicated loads of borehole wall into simple ones; based on elastic mechanics and linear elastic fracture mechanics, a function describing gas pressure distribution along the crack is proposed to derive the corresponding stress strength of crack top; and then the conditions of crack initiation in borehole rocks are concluded. The conditions reflect the influence of gas pressure gradient varying with time on fracture geometry. The example analysis and field contrast test reveal that, compared with the common High Energy Gas Fracturing, the multi-pulse gas loading fracturing gives rise to higher crack initiation pressure, lower crack arrest pressure, greater extension of fracturing time, and forms 2-3 times fracture length in the formation. Combined with hydraulic fracturing, it can lower formation breakdown pressure and further improves formation permeability. (11 refs)

Main heading: Gases

Controlled terms: Crack initiation - Pressure gradient - Combustion - Hydraulic fracturing

Uncontrolled terms: Crack extension - Deflagration gas - Formation breakdown pressure - Formation permeability - High energy gas fracturing - Linear elastic fracture mechanics - Load fracturing - Multipulses

Classification Code: 512.1.2 Petroleum Deposits : Development Operations - 944.4 Pressure Measurements - 951 Materials Science

Open Access type(s): All Open Access, Gold

Database: Compendex

Data Provider: Engineering Village

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54. A robust probability principle component analysis method

Mu, Xiangyang (1, 2); Zhang, Taiyi (1); Zhou, Yatong (3)

Source: *Hsi-An Chiao Tung Ta Hsueh/Journal of Xi'an Jiaotong University*, v 42, n 10, p 1217-1220, October 2008;

Language: Chinese; **ISSN:** 0253987X; **Publisher:** Xi'an Jiaotong University

Author affiliation: (1) School of Electronics and Information Engineering, Xi'an Jiaotong University, Xi'an 710049, China (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an 710065, China (3) School of Information Engineering, Hebei University of Technology, Tianjin 300401, China

Abstract: In order to overcome the drawback that traditional principal component analysis fails to the outliers existing in the realistic data, a robust probability principal component analysis (RPPCA) method is proposed. A continuous decision variable is introduced into the energy function, and the preset hard threshold is replaced by a soft adaptive threshold which is automatically determined by the data. The algorithm is then embedded in the procedure of PPCA's principal component feature extraction. Compared with PCA and probability principal component analysis (PPCA), the proposed RPPCA can resist outlier well, is more robust than PPCA, and enlarges the real application area. The simulation results show that the algorithm improves 3.2% classification accuracy to LPCA, and 0.7% to PPCA on average. (9 refs)

Main heading: Feature extraction

Controlled terms: Probability - Extraction - Principal component analysis - Statistics

Uncontrolled terms: Adaptive thresholds - Classification accuracy - Decision variables - Principal Components - Principle component - Principle component analysis - Probability principal component analysis - Real applications

Classification Code: 802.3 Chemical Operations - 922.1 Probability Theory - 922.2 Mathematical Statistics

Database: Compendex

Data Provider: Engineering Village

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55. Application of a scaling kernel in signal approximation of least squares support vector machines

Mu, Xiangyang (1, 2); Zhang, Taiyi (1); Zhou, Yatong (3)

Source: *Hsi-An Chiao Tung Ta Hsueh/Journal of Xi'an Jiaotong University*, v 42, n 12, p 1464-1467+1480, December 2008; **Language:** Chinese; **ISSN:** 0253987X; **Publisher:** Xi'an Jiaotong University

Author affiliation: (1) School of Electronics and Information Engineering, Xi'an Jiaotong University, Xi'an 710049, China (2) School of Electronic Engineering, Xi'an Shiyou University, Xi'an 710065, China (3) School of Information Engineering, Hebei University of Technology, Tianjin 300401, China

Abstract: In order to overcome the problem that the least square support vector machines (LS-SVM) using Gaussian kernel cannot approximate arbitrary signal with multi-scale, a scaling kernel for LS-SVM is proposed. The scaling kernel in dot-product type is constructed under the framework of reproducing kernel Hilbert spaces. The kernel satisfies the Mercer condition, has the characteristic of dilation and translation, and forms a set of complete bases in the scale subspace. Then the Lagrangian multiplier is used to obtain the approximation coefficients under the criterion of structure risk minimization by solving the constrained programming of LS-SVM in signal approximation. The LS-SVM with scaling kernel can approximate arbitrary signal with multi-scale, and the proposed algorithm is promising in application since only one free parameter is adjusted for optimization. Simulation results show that the approximation performance of the scaling kernel is similar to the wavelet kernel; and compared with the traditional Gaussian kernel, the normalized root mean squared error increases about 8.4%. (12 refs)

Main heading: Least squares approximations

Controlled terms: Mean square error - Support vector machines - Computer programming - Lagrange multipliers

Uncontrolled terms: Approximation coefficients - Approximation performance - Least square support vector machines - Least squares support vector machines - Reproducing Kernel Hilbert spaces - Scaling kernel - Signal approximation - Structure risk minimization

Classification Code: 723 Computer Software, Data Handling and Applications - 723.1 Computer Programming - 921.6 Numerical Methods - 922.2 Mathematical Statistics

Database: Compendex

Data Provider: Engineering Village

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56. Effect of flow rate on CO₂ corrosion behavior of P110 steel

Zhao, Guo-Xian (1); Lu, Xiang-Hong (1); Han, Yong (2)

Source: *Cailiao Gongcheng/Journal of Materials Engineering*, n 8, p 5-8, August 2008; **Language:** Chinese; **ISSN:** 10014381; **Publisher:** Beijing Institute of Aeronautical Materials (BIAM)

Author affiliation: (1) Department of Materials Science and Engineering, Xi'an Petroleum University, Xi'an 710065, China (2) Xi'an Moore Oil Engineering Laboratory, Xi'an 710065, China

Abstract: Influences of flow rate on CO₂ corrosion behavior of P110 steel were studied in simulated environments. Morphologies and thickness of scales at different flow rate were analyzed by SEM technology. The results showed that maximal corrosion rate presented at 1.5 m/s. Increasing flow rate promoted mass and charge transfer of corrosive factors, accelerated the corrosion reaction. But morphologies and microstructure of corrosion products layer changed, resulting in thinner and more compact corrosion product layer, impeding the diffuse process for mass and charge transfer through it. (9 refs)

Main heading: Corrosion rate

Controlled terms: Steel corrosion - Corrosive effects - Carbon dioxide - Charge transfer - Flow rate

Uncontrolled terms: CO₂ corrosion - Corrosion product layers - Corrosion products - Corrosion reaction - Corrosion scale - Corrosive factors - Diffuse process - Simulated environment

Classification Code: 539.1 Metals Corrosion - 545.3 Steel - 631 Fluid Flow - 802.2 Chemical Reactions - 804.2 Inorganic Compounds - 943.2 Mechanical Variables Measurements

Database: Compendex

Data Provider: Engineering Village

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57. Interfacial polymerization of morphologically modified polyaniline: From hollow microspheres to nanowires

Li, Jinbo (1, 2); Jia, Qingming (3); Zhu, Jiewu (3); Zheng, Maosheng (1)

Source: *Polymer International*, v 57, n 2, p 337-341, February 2008; **ISSN:** 09598103, **E-ISSN:** 10970126; **DOI:** 10.1002/pi.2353; **Publisher:** John Wiley and Sons Ltd

Author affiliation: (1) School of Material Science and Engineering, Xi'an Jiaotong University, Xi'an 710049, China (2) Department of Science and Technology, Xi'an Shiyou University, Xi'an 710065, China (3) Faculty of Chemical Engineering, Kunming University of Science and Technology, Kunming 650224, China

Abstract: Background: Polyaniline (PANI) has attracted much attention in many fields due to its chemical and physical properties, and different nanostructures of PANI changing from one-dimensional to three-dimensional have been obtained. By changing the concentration of cetyltrimethylammonium bromide (CTAB), the morphology of hydrochloric acid-doped polyaniline could be changed from one-dimensional nanoneedles or nanowires with a network structure

(50-100nm in diameter) to three-dimensional hollow microspheres (ca 400nm in outer diameter) via combining interfacial polymerization and self-assembly process. Results: These different nanostructures of PANI were proved using scanning electron and transmission electron microscopies. A plausible mechanism of the formation of the changeable nanostructures of PANI may be different from that of interfacial polymerization without surfactant or a traditional homogenous reaction system using CTAB as surfactant. Conclusion: The results obtained from Fourier transform infrared spectrometry, X-ray diffraction and the four-probe method showed that the molecular structure of PANI does not change with increasing CTAB concentration, but crystallinity and conductivity of PANI increase with surfactant concentration. © 2007 Society of Chemical Industry. (43 refs)

Main heading: Polyaniline

Controlled terms: Fourier transform infrared spectroscopy - Hydrochloric acid - Microspheres - Morphology - Nanowires - Polymerization - Scanning electron microscopy - Surface active agents - Transmission electron microscopy - X ray diffraction analysis

Uncontrolled terms: Cethyltrimethylammonium bromide - Four-probe method - Interfacial polymerization

Classification Code: 708.2 Conducting Materials - 803 Chemical Agents and Basic Industrial Chemicals - 804.2 Inorganic Compounds - 815.1.1 Organic Polymers - 815.2 Polymerization - 931.2 Physical Properties of Gases, Liquids and Solids

Treatment: Theoretical (THR) - Experimental (EXP)

Database: Compendex

Data Provider: Engineering Village

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58. Pilot test of blasting-acid fracturing complex technology in gas wells of western Sichuan

Wu, Fei-Peng (1); Pu, Chun-Sheng (1, 2); Ren, Shan (1, 3); Wang, Xiang-Zeng (1, 4)

Source: *Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/Journal of China University of Petroleum (Edition of Natural Science)*, v 32, n 6, p 101-103+108, December 2008; **Language:** Chinese; **ISSN:** 16735005; **Publisher:** University of Petroleum, China

Author affiliation: (1) College of Petroleum Engineering, China University of Petroleum, Dongying 257061, China (2) College of Petroleum Engineering, Xi'an Shiyou University, Xi'an 710065, China (3) Institute of Engineering Technology, Southwest Company, SINOPEC, Deyang 618000, China (4) Yanchang Petrochemical Company, Xi'an 710000, China

Abstract: Aimed to the problems of the abnormal high fracturing pressure, un-conspicuous operating measures effect and the short valid date during the fracturing process of deep compacted gas reservoirs in western Sichuan, blasting-acid fracturing complex technology was proposed. In order to determine the reasonable propellant charge, the rock failure strength model under the dynamic loading and the in-casing limiting load model in the non-uniform ground stress field were established by the theoretical analysis to the process of the blasting fracturing. The fracturing program for well Chuangao 561 was designed and the field testing was carried out. The results show that the reservoir fracturing pressure can be reduced by the blasting fracturing, and the permeability near wellbore is improved. The blasting-acid fracturing complex technology can effectively solve the problem of fracturing and putting into production of the deep compacted gas reservoir, and the well productivity is greatly improved. (13 refs)

Database: Compendex

Data Provider: Engineering Village

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59. Surface structure and energy of B2 type intermetallic compound NiAl

Zhang, Jian-Min (1); Wang, Dou-Dou (1, 2); Chen, Guo-Xiang (3); Xu, Ke-Wei (4)

Source: *Applied Surface Science*, v 254, n 8, p 2540-2543, February 15, 2008; **ISSN:** 01694332; **DOI:** 10.1016/j.apsusc.2007.09.079; **Publisher:** Elsevier

Author affiliation: (1) College of Physics and Information Technology, Shaanxi Normal University, Xian, 710062 Shaanxi, China (2) The Institute of Telecommunication Engineering, the Air Force Engineering University (AFEU1), Xian, 710077 Shaanxi, China (3) School of Science, Xian Shiyou University, Xian, 710065 Shaanxi, China (4) State Key Laboratory for Mechanical Behavior of Materials, Xian Jiaotong University, Xian, 710049 Shaanxi, China

Abstract: The surface structure and energies for 22 surfaces of NiAl, an ordered intermetallic compound of B2 structure, have been studied by using embedded atom method. The results show that, for alternating Ni and Al surfaces with odd numbers of the sum of their three Miller indices, the energy difference between the Ni terminated surface and Al terminated surface increase linearly with increasing the interlayer distance. So from surface energy minimization, the Al terminated surface is favorable for each alternating Ni and Al surface. This is in agreement with experimental results. However, the energy of the (1 1 0) surface belonged to the other kind of the surface consisted of stoichiometric atomic layers and with even numbers of the sum of their three Miller indices, is the lowest in all two kinds

of the surfaces. Therefore the (1 1 0) texture of NiAl appears mostly in the experiments. © 2007 Elsevier B.V. All rights reserved. (30 refs)

Main heading: Intermetallics

Controlled terms: Atoms - Interfacial energy - Nickel compounds - Stoichiometry - Surface structure

Uncontrolled terms: Embedded atom methods - Miller indices - Stoichiometric atomic layers

Classification Code: 531.1 Metallurgy - 801.4 Physical Chemistry - 804.2 Inorganic Compounds - 931.2 Physical Properties of Gases, Liquids and Solids - 931.3 Atomic and Molecular Physics

Treatment: Theoretical (THR) - Experimental (EXP)

Database: Compendex

Data Provider: Engineering Village

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60. Corrosion behavior of SM 80SS tube steel in stimulant solution containing H₂S and CO₂

Yin, Z.F. (1, 2); Zhao, W.Z. (1); Bai, Z.Q. (2); Feng, Y.R. (2); Zhou, W.J. (3)

Source: *Electrochimica Acta*, v 53, n 10, p 3690-3700, April 1, 2008; **ISSN:** 00134686; **DOI:** 10.1016/j.electacta.2007.12.039; **Publisher:** Elsevier Ltd

Author affiliation: (1) School of Materials Science and Engineering, Xi'an Jiaotong University, Xi'an, 710049, China (2) The Key Laboratory for Mechanical and Environmental Behavior of Tubular Goods, Tubular Goods Research Center, CNPC, Dianzier Road, Xi'an Shannxi 710065, China (3) School of Petroleum Engineering, Xi'an Shiyou University, Xi'an, 710065, China

Abstract: Scanning electron microscopy, X-ray diffraction and electrochemical measurement technique were applied to investigate the corrosion of SM 80SS tube steel in stimulant solution with carbon dioxide (CO₂) and hydrogen sulfide (H₂S) at variable conditions of PC O₂ / PH₂ S and temperature. The results suggest that there exists a synergism of sweet corrosion and sour corrosion on the steel surface, corrosion attack increases in the initial stage and then decrease with the increase of PC O₂ or PH₂ S; serious corrosion occurs in the PC O₂ / PH₂ S ranged from 31 to 520. In addition, the fitted parabola function equation $Y = 0.47873 + 0.04014X - (3.23788E-5)X^2$ is established, and the most serious corrosion is 600 for PC O₂ / PH₂ S. Under the moderate contents of PC O₂ and PH₂ S, the corrosion scale consists of FeSO₄ and FeCO₃; for relatively high PH₂ S, additive product FeS comes into being at high temperature such as T = 150 °C, product FeO(OH) is found in the corrosion scale. The H₂S corrosion has a significant effect on the whole reaction process and iron sulfide is superior to precipitating on the steel surface compared with iron carbonate. In addition, the surface scales of iron sulfide almost act as a diffusion barrier and inhibit the corrosion by a coverage effect strongly depending on H₂S concentration by EIS measurement. © 2007 Elsevier Ltd. All rights reserved. (30 refs)

Main heading: Steel corrosion

Controlled terms: Carbon dioxide - Diffusion barriers - Hydrogen sulfide - Precipitation (chemical) - Scanning electron microscopy - X ray diffraction analysis

Uncontrolled terms: Corrosion attacks - Corrosion scales - Electrochemical measurement - Parabola function equations - Tube steel

Classification Code: 804.2 Inorganic Compounds - 802.3 Chemical Operations - 801 Chemistry - 741.1 Light/Optics - 545.3 Steel - 539.3 Metal Plating - 539.1 Metals Corrosion

Funding Details: Number: 50231020, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

Funding text: Financial support for the work by National Science Foundation of China (No. 50231020), and Key Laboratory Opening Fund of Corrosion and Protection of Tubular Goods Research Center of China National Petroleum Corporation is gratefully acknowledged.

Treatment: Theoretical (THR) - Experimental (EXP)

Database: Compendex

Data Provider: Engineering Village

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61. Galvanic corrosion associated with SM 80SS steel and Ni-based alloy G3 couples in NaCl solution

Yin, Z.F. (1, 2); Yan, M.L. (2); Bai, Z.Q. (2); Zhao, W.Z. (1); Zhou, W.J. (3)

Source: *Electrochimica Acta*, v 53, n 22, p 6285-6292, September 20, 2008; **ISSN:** 00134686; **DOI:** 10.1016/j.electacta.2008.04.029; **Publisher:** Elsevier Ltd

Author affiliation: (1) School of Materials Science and Engineering, Xi'an Jiaotong University, Xi'an 710049, China (2) Key Laboratory for Mechanical and Environmental Behavior of Tubular Goods, Tubular Goods Research Center, CNPC, Dianzier road, Xi'an, Shannxi 710065, China (3) School of Materials Science and Engineering, Xi'an Shiyou University, Xi'an 710065, China

Abstract: Potentiodynamic polarization and electrochemical impedance measurements were used to examine the effects of area ratio S_c/S_a and temperature on the galvanic corrosion behavior between SM 80SS steel and Ni-based alloy G3 exposed to CO₂ and NaCl environment. It mainly comprised of the electrochemical characterization such as the self-corrosion potential, the galvanic current and Nyquist plots and so on. Weight loss method was utilized to investigate the corrosion rate of the galvanic couples in high temperature and high-pressure autoclave. After the tests, the surface morphologies of the samples were detected by SEM. In addition, pitting corrosion behavior of anodic material caused by galvanic corrosion was also investigated. The quadratic polynomials corresponded to similar parabolas were fitted to compare the curves of I_g vs. S_c/S_a and CR a vs. S_c/S_a . The results indicate that temperature and S_c/S_a have important effects on the couples of the galvanic corrosion. © 2008 Elsevier Ltd. All rights reserved. (12 refs)

Main heading: Galvanic corrosion

Controlled terms: Pitting - Polarization - Nickel alloys - Corrosion rate - Corrosive effects - Sodium alloys - Steel corrosion - High temperature corrosion - Sodium chloride

Uncontrolled terms: Corrosion potentials - Electrochemical characterizations - Electrochemical impedance measurements - Galvanic corrosion behavior - High temperature and high pressure - Ni based alloy - Quadratic polynomial - Weight loss method

Classification Code: 539.1 Metals Corrosion - 545.3 Steel - 548.2 Nickel Alloys - 549.1 Alkali Metals

Database: Compendex

Data Provider: Engineering Village

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62. Advance in catalysts for propylene oligomerization

Zhang, Juntao ; Wang, Haijun ; Zhang, Guoli ; Su, Biyun ; Gao, Fei

Source: *Shiyou Huagong/Petrochemical Technology*, v 37, n 3, p 305-311, March 2008; **Language:** Chinese; **ISSN:** 10008144; **Publisher:** Beijing Research Institute of Chemical Industry

Author affiliation: (1) Research Center of Petroleum Processing and Petrochemicals, Xi'an Petroleum University, Xi'an 710065, China (2) Department of Abroad Engineering Manage, Second Construction Corporation, CNPC, Lanzhou 730060, China

Abstract: Recent advance in homogeneous and heterogeneous catalysts for propylene oligomerization was reviewed. Varieties, structures and characteristics of ligands; varieties, valent states and migrating behavior of metal cations in homogeneous catalysts; varieties, structures and characteristics of supports; and varieties and valent states of metal cations in heterogeneous catalysts were expatiated on. Active sites of the catalysts, formation of intermediates in reaction and catalysis mechanism were discussed. Active species (M-H bond) of homogeneous catalysts were considered same as that of heterogeneous catalysts. The important points of future development are synthesizing excellent ligands and adjusting environment between metal cations and ligands for homogeneous catalysts, and synthesizing and modifying excellent supports for heterogeneous catalysts. (38 refs)

Database: Compendex

Data Provider: Engineering Village

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63. Self-diffusion of Ni in the intermetallic compound Ni₃Al

Chen, Guo-Xiang (1, 5); Wang, Dou-Dou (2); Zhang, Jian-Min (3); Huo, Han-Ping (1); Xu, Ke-Wei (4)

Source: *Physica B: Condensed Matter*, v 403, n 19-20, p 3538-3542, October 1, 2008; **ISSN:** 09214526; **DOI:** 10.1016/j.physb.2008.05.023; **Publisher:** Elsevier

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Abstract: Combining molecular dynamic (MD) simulation with modified analytic embedded-atom method (MAEAM) potential, the defect formation, migration and activation energies of Ni self-diffusion in intermetallic compound Ni₃Al have been calculated for five diffusion mechanisms, nearest-neighbor (NN) jump, next-nearest-neighbor (NNN) jump, straight [010] six-jump cycle (6JC), bent [0 10] 6JC and two concerted jumps. The results show that the Ni self-diffusion is dominated by the NN jump since it requires essentially the lowest migration or activation energy ($Q=2.511$ eV) in the five diffusion mechanisms. This is consistent with the experimental results. Crown Copyright © 2008 Published by Elsevier B.V. All rights reserved. (41 refs)

Main heading: Point defects

Controlled terms: Aluminum alloys - Nickel compounds - Molecular dynamics - Diffusion - Activation energy - Binary alloys - Intermetallics

Uncontrolled terms: Defect formation - Diffusion mechanisms - MAEAM - Modified analytic embedded-atom method - Nearest neighbors - Ni₃Al - Self-Diffusion

Classification Code: 531.1 Metallurgy - 541.2 Aluminum Alloys - 801.4 Physical Chemistry - 933.1.1 Crystal Lattice

Funding Details: Number: 2004CB619302, Acronym: -, Sponsor: -; Number: 50271038, Acronym: NSFC, Sponsor: National Natural Science Foundation of China;

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