

Table of Contents

Preface and Committees

Chapter 1: Measure Control Technologies and Intelligent Systems

Synthetics of ZnO Nanowires on GaN/Sapphire Substrate by Gold Catalyst C.H. Xu, K. Leung and C. Surya	3
Discussion on Safety Management Mechanism of the LNG Carrier Z.L. Jiao	7
Research and Designment of Untouched Phase-Detecting Sensor for High-Voltage Line X. Ji, X.W. Zhang and J.N. Tang	13
Research and Development of High Temperature Electrothermal Materials Y.Y. Zhang, Y.G. Li, K. Zhang and Y. Tian	17
Application of Modular Programming Based on Virtual Instruments in Industrial Measurement and Control System Q.Q. Lu, W. Shao and C.L. Xia	23
Control of Automobile's Automatic Parking H. Mei	28
Surface Defect Inspection and Classification of Segment Magnet by Using Machine Vision Technique H.H. Jiang and G.F. Yin	32
A Micro-Resistance Measurement Based Design Approach of Digital Micro-Ohmmeter J.H. Deng, W.J. Yan and Q. Yang	36
Development of Temperature Control System for Large-Scale Pre-Oxidation Furnace K. Yu and B. Zhu	43
The Dynamic and Observed Pendulum Control System Based on Optimum Control T. Zhang	48
<i>In Situ</i> Higher-Time Derivative of Temperature Sensors for Aerospace Heat Transfer M.G. Huang, B.S. Elkins and J.I. Frankel	53
Study on On-Line Torque Telemeter System for Large Motor in Active Oilfield Service J. Liu, W.S. Xiao and F.D. Wang	59
Research of Thickness Dynamic Detection of Thin Sheets J.B. He, Z.Y. Yang and W.J. Jiang	63
The Intelligent Detection System of the Machineromless Elevator Based on WSN Z.J. Chen, X. Liu, X.Q. Yan and R. Zhang	67
A K-Means Clustering Algorithm Based on Enhanced Differential Evolution L. Mao, H.J. Gong and X.Y. Liu	71
LonWorks Node Communicating on Twisted Pairs Based on Virtual Token L. Xue and S. Yang	76
An Angle Measuring System for Knife Blade Based on Laser and Electronic Clinometer F.J. An, Y.J. Feng, Z.M. Tan, W.Q. Shi, Z.Y. Xiong, Y.Q. Li, C.Y. Huang and W.H. Wang	80
Design of an Innovative High-Torque Brake Y.J. Shiao and C.Y. Chang	84
Calculation Method of Intumescent Coatings of Fire Protection for Concrete-Filled Hollow Structural Steel Columns H.Z. Chen, Y.L. Wang, J.G. Liu, G.L. Wang, R.Q. Ma and W. Xu	88
Optimization of Poly-Silicon Deposition Process for Semiconductor Bridge Z.Y. Zhang, Y. Mei, Z.C. Feng, X.G. Li, J.G. Li and G.X. Hu	92
Inhibitive Performance of 1,4/1,6-Bis(α-Alkyl Pyridinium) Butane/Hexane Dibromide on A3 Steel X.H. Jiang, L.M. Zhou, S.Z. Yao, M. Duan and X.Q. Hu	96

Chapter 2: Transmission and Control of Fluid

Study on Rotor's Tooth Profiles of Double Enveloping Cycloid Pump C.Y. Li and B.K. Chen	105
Research of the Pilot Operated Relief Valve for MRF System X. Wu, Z.Y. Wu, X. Wang, J.T. Wang, C.Z. Wen and Q.H. Wang	113
Enhancement of Fluid Mixing in a Double T-Shaped Micromixer by Periodic Disturbances of Pressure H.C. Chiu and J.M. Chen	118
Research on Structural Optimization of Oil Bit Screw Thread B. Li and X. Wang	124
The Design and Experimental Study of Automatic Backwash Fiber Bundle Filter Y.M. Zhou, C. Li, L.L. Xu, S.Y. Luo and C.J. Yi	130
Effect of Mold Powder on Faint-Sliver Defect in if Cold-Rolled Steel Sheet G.R. Wu	134
Research on Non-Circular Planetary Gear Pump Z.H. Luan and M. Ding	140
The Development of Automatic Switch Jet Element Q.S. Xiong, F.J. Kong, J. Li, S.L. Liu and Y.S. Ye	144
Optimization of Structure and Calculation of Flow-Force on Poppet Valve under Converging Flow S.J. Zheng and L. Quan	148
The Boron Effect on Mechanical Properties of Aged 2024 Aluminum Alloy N. Khatami, S. Mirdamadi and H. Razavizadeh	152
The Application of Electrohydraulic Proportional Technology in Mill Loading System X.B. Ji, X.Y. Qi, T.H. Song, A.J. Li and G.Y. Zuo	157
Research on Passive Control of Pressure Swing Adsorption System of Alternating Double Tank K. Chen, X.W. Zeng and X.P. Qiu	163
Research and Development of the Hydraulic Cylinder Control System on FIX C.M. Wang, H. Li, S.Q. Zhou and C.H. Xie	167
Boundary Element Inverse Analysis by Using Particle Swarm Optimization for Reinforced Concrete Corrosion Identification S. Fonna, M. Ridha, S. Huzni, I. Israr and A.K. Ariffin	171
Experimental Study of Self-Cleaning Plate Shell Heat Exchanger Y.M. Zhou, C. Li, L.L. Xu, S.Y. Luo and C.J. Yi	176
Finite Element Analysis of TA15 Titanium Alloy Beam Hammer Forging Forming at Different Temperatures Y. Tong	180
Effect of Annealing on Calcium Carbonate Morphology of Mollusk Shell Z.C. Chang, C.B. Lin, J.S. Ho and C.K. Shao	184
A Study on the Impact of Different Tumbler Inlet Conditions on the Clothes Dryer's Tumbler Efficiency Y.L. Wu, K.H. Chien, K.S. Yang and C.C. Lo	188

Chapter 3: Embedded System

The Development of a Three Dimensional Displacement Platform X. Li and S.H. Wang	195
The Mechanical Properties of Gray Cast Iron and Metallographic Structure Effect on the Chip Shape X.B. Huang, Y.G. Ye, X.Q. Shen and X. Chang	200
Steady Rheological Properties and Microstructure of Polycarbonate/Highly Branched Polystyrene Blends A.Y. Li, J.Y. Chang, X.B. Zuo and R.X. Yuan	204
Simulation Study of Air Entrapment of Melt Flow inside the Shot Sleeve in Die Casting Processes S.S. Dou	210

Effects of Finish-Rolling Reduction on Microstructure and Mechanical Properties for C-Si-Mn Hot Rolled Dual-Phase Steel B.B. Sun, Z.W. Jia and H.M. Zhang	215
Design of Embedded Monitored Control System for Ultrasonic Reaction Kettle B.Q. Wang and L.L. Yang	219
Impellent Tramcar Machine Hydraulic and Electrical Control System Y.J. Jia, G.Z. Cheng and Y.J. Dai	223
Building Pore-Networks via Maximal Inscribed Spheres J.X. Xie, Q.Z. Teng and Y.C. Liu	227
Construction of Ore Slurry Pipeline of Bayan Obo J.Q. Tan	234
Development of Air Hammer with Self-Propelled Round Bit and the Contact Analysis of the Key Components C. He, L.X. Han, X.B. Chen and L. Chen	243
Implementation of Lean Manufacturing in Saudi Manufacturing Organisations: An Empirical Study M.A. Karim, M. Aljuhani, R. Duplock and P. Yarlagadda	250

Chapter 4: NEMS/MEMS Technology and Equipment

The Steady State Rheological Behavior of Semisolid AlSi6Mg2 Alloy H.C. Luo, S.P. Chen, Q. Nie, E.S. Xu and L.P. Ju	257
Study of Electroless Plating Ni-B Composite Coating and its Properties H. Yang, S. Qiu, Y.F. Lu, X.L. Yin and Z.X. Liu	261
Study on Catalytic Combustion of Hydrogen inside Micro Tube J.J. Chen, Q. Wang, J.F. Pan and Z.X. He	265
Design and Analysis of 7-DOF Fiber Placement Machine D.W. Xun, C.J. Luo, K. He and R. Du	271
Numerical Study on Three-Dimensional Wall Effects of Flat Micro Nozzle J.J. Tong, J.W. Cen and J.L. Xu	276
Efficiency Improvement of Solar Cell with ZnO Nanotip Array Prepared by Aqueous Solution Deposition M.K. Lee, N.R. Cheng, C.H. Fan and C.F. Yen	283
Effect of the Chloride Content on the Rust Layers of 09CuPCrNi Z.F. Wang, L.X. Wu, Y.Q. Sun, R.D. Han and Z.H. Yao	287
Effect of Temperature on the Performance of AlTiC Metal Alloys Y.F. Wang and R. Li	291
Ant Colony Algorithm: A New Method Choosing Torsion Bar Diameter P.Y. Rao	295
Grey Equal Weight Cluster Analysis of Flue-Cured Tobacco Based on Chemical Compositions G.L. Feng, L. Li, D.L. Li, N. Li and Y. Dai	299

Chapter 5: Monitoring and Control of the Manufacturing Process

Synthesis and Crystal Structure of a Cadmium(II) Complex with 2-(4'-Chlorine-Benzoyl)-Benzoic Acid and 1,10-Phenanthroline X.M. Li, Z.T. Wang and Q.W. Wang	313
Ferrocene-Based Antibacterial Agents: Synthesis, Characterization, and Biological Evaluation of Metal (II) Complexes with Glycine-Derived Compounds Y.T. Liu, X.M. Sun and D.W. Yin	317
Multiple-Response Surface Approach: Modeling and Optimization B. Nie, D. Liao, J. Ding and Y.D. He	321
Effect of Chemical Pretreatment on Cotton Stalk SCMP Bleaching Properties X.Q. Wang, Z.Q. Pang, J.C. Chen and G.H. Yang	326

Comparison of Heuristic for Flow Shop Scheduling Problems with Sequence Dependent Setup Time	
P. Kaweejitbundit	332
Forest Biomass Estimation Based on Remote Sensing Method for North Daxingan Mountains	
Y.Y. Zhang, F.R. Li and F.X. Liu	336
Failure Analysis on a Counterweight Assembly of an Aeroengine	
H.J. Tang and H.Y. Yao	342
Business Excellence Measurement of Supply Chains Based on Collaboration Degree and Service Level	
W.Z. Tan, Y.T. Chai and Y. Liu	349
Thermal Elastoplastic Behavior of Dispersion Nuclear Fuel Elements	
X. Jiang and X.H. Liu	353
Optimal Planning for Product Blending	
G.L. Liu, J. Zhao and W. Wang	358
Material Examination of a Broken Bolt	
Q.S. Zang, G. Yao and H.H. Su	362
Surface Electrical Resistances Properties of CNF/PC Nano-Composite Processing by Injection Molding	
J.H. Qiu, K. Uchiya, L. Lin, X.L. Wu and Y. Zhao	367
Influence of Solution Heat Treatment on Microstructures of Semisolid Cast 7075 Aluminium Alloy	
N. Mahathaninwong, S. Wisutmethangoon, T. Plookphol and J. Wannasin	371
Study on Intermediate Frequency Spot Welding Process of Hot Stamping High Strength Steel	
Y. Yu, C. Wang, S.J. Chen and Z.Y. Lu	375
Theoretical and Experimental Research on Perforation Remnant Energy	
C.B. Li, J. Xiong and M.Y. Ma	379
A Logistics and Location Decisions Model for a Closed-Loop Logistic System with Uncertain Demands	
J.W. Xu and Y.L. Zhu	386
The Study on Assessment Index System of ERP Implementation Competence Maturity in China	
Y. Wang, T.Y. Zhang and L.H. Wang	391
Research on Applying User-Based Collaborative Filtering Algorithms to Building Products Selection	
L.M. Sun, F.J. Luan and T.B. Liu	396
Flow Field Simulation and Atomization Characteristic of Pneumatic Oil Mist Swirler	
X.M. Yang, J.W. Chen, L. Li, J.J. Liu and Y.L. Zhao	400
Control Chart Based on Middle Mean for Fine Manufacturing Process	
D.Y. Li, J. Yang, M. Li and X. Zhang	406
Game Theoretical Research for Airlines Apply for Deicing Resources	
Z.W. Xing, J.H. Li and P.C. Zhang	411
Effects of Dry Process Technology on Quality of “Laba” Garlic during Process	
X.H. Li, Y. Wang, X.F. Ju, D. Wang, Y.G. Xing and X. Liu	416
The Prediction Model of COREX Cold Gas Content of Carbon Dioxide Based on MOSC-PLS	
C.X. Zhao, Q. Zhang, J.W. Xu, M. Li and J.H. Yang	420
Study on Property of Carbon/Glass Braided Fabric Reinforced Composite	
M. Du, L. Zhao, L.B. Lv, Z.Y. Wang and Y. Xun	426
Optimal Policies for Crude Oil Selection	
G.L. Liu, J. Zhao and W. Wang	431
Electrochemical Determination of Inorganic Phosphate	
W.J. Zheng, H.T. Zheng, Y.L. Li, X.S. Wang and S.I. Suye	435
Influence of Preset Pulsed Magnetic Field on Process Stability of Short Circuiting Transfer in Gas Metal Arc Welding	
S.J. Chen, C.H. Liu, Y. Yu and S.J. Bai	440
Analysis of Speed and Belt Deviation of the Conveyor Belt	
Q.Y. Chu, G.Y. Meng and X. Fan	444

Experimental Research on Fatigue Behavior of Recycled Aggregate Reinforcement Concrete Made from Building Scrap H.Q. Yan, Q.Y. Wang and N. Yan	448
Mix Design and Compressive Strength of Geopolymer Concrete Containing Blended Ash from Agro-Industrial Wastes M.A. Mohd Ariffin, M.W. Hussin and M.A. Rafique Bhutta	452
Study of Thermal Fusion Welding Technique and Welded Junctions Stress for GERPP Pipes Y.S. Sun and X. Zhang	458
Experimental Correlation between Metallurgical Parameters, Hardness and Machinability of 319 Al-Si-Cu-Mg Alloys M.M. Tash and S. Alkahtani	462
Study on the Lubrication and Antifriction Mechanism of Low Frictional Self-Lubricating Wear-Resisting Coating Y.C. Zhao, S.F. Huang and X.M. Liu	477
Optimization of the Process Conditions Based on Depositing Rate and Micro-Hardness for Electroless Ni-P-Nano SiC Composite Plating H. Wang	483
Effect of Process Parameters on Damage during the Warm Drawing of Magnesium Alloy Shell for Notebook PC Y. Tong	487
HPHT Growth and IR Characterization of Large Diamond Crystals in FeNi-C-FeS Systems C.Y. Zang, L.J. Chen and L.X. Chen	491
3D Numerical Simulation Method for Working Behavior of Drill String System Y.C. Kuang, Y.X. Wu, J.L. Yan and Q. Wang	496
Analysis of Material and Heat Treatment of the High-Pressure Fracturing Pump Valves Q.M. Yang and L.J. Yang	502

Chapter 6: Petroleum Machinery and Engineering

Beijing Necessity of Development of Natural Gas Buses J.L. Han and Y.S. Li	509
Application of Fluid Inclusion Technology to the Study of Hydrocarbon Charge History in Upper Triassic Reservoir of Chuanxi Foreland Basin, China H. Xu and D.Z. Tang	517
The Integral Equation of the Micro-Fracture's Electrical Logging Response F.P. Liu, M.C. Zhang, A.L. Wang and X.S. Wang	521
Study on New Cement Slurry System for Heavy Crude Oil Thermal Recovery in Well Cementation S.M. Guan, Z.Y. Li, P. Xie, Z.Q. Wu and X.Y. Guo	526
Fracture Analysis of $\Phi 73\text{mm}$ N80 NU Tubing in Western China Oilfields J.J. Wang, K. Lin, G. Wang and P. Chen	533
Research Development of Liner Hanger Technologies D.Y. Wu, Z. Liu, H. Li, X.Q. Xiao and J.J. Li	538
Numerical Study of Oil-Water Two Phase Separation in Hydrocyclone F.L. Zhang, S.S. Deng and P.F. Zhang	543
Study on the Relation between Oscillation Frequency of Self-Excited Oscillation Pulsed Water Jet and Self-Excited Pulsed Water Jet Devices J.H. Pei	547
The Simulation of Dropped Objects on the Offshore Structure L.P. Sun, G. Ma, C.Y. Nie and Z.H. Wang	553
Stress Analysis of Side Plates on the Logging Truck's Cable Reel X. Liu, G.Q. Zhang, Q.L. Wang and Z. Wang	557
Design and Application of Forced Heat Dispersing Device of Superdeep Drilling Rig in High Temperature Z.F. Bao, H.F. Dai, P. Zang and J.P. Wang	561
The Structure and Technical Parameters Analysis of Snubbing Unit G.X. Zhong, T.S. Zhao, T.Z. Lv and C.Z. Peng	566

Kernel Orthogonal Neighborhood Preserving Discriminant Analysis X.Z. Liang, J.Z. Li and Y.E. Lin	571
Process and Corrosion Resistance of Plasma-Sprayed NiCoCrAlY/(Al₂O₃-13%TiO₂) Coatings on AZ91D Magnesium Alloy S. Lu, Y. Chen, Z.P. Weng and J. Chen	575
Research and Application of Expansion Evaluation Device for Solid Expandable Tubular Z.Y. Pan, S.Y. Song, W.H. Liu, Y.R. Feng and X.H. Wang	579
Study on Drifting Drilling Assembly and Casing String's Stiffness Ratio X.D. Zhang, R.Y. Gou, H.J. Liang, Y. Gong and P. Xiao	583
Design Research of the Hydraulic Stopple Plugging Machine for Pipeline Maintenance under Pressure	590
Design of down-Hole Oil-Water Separation and Reinjection in the same Well System with Surface Driving Single Screw Pump C.W. Zhao and Z.L. Li	595
Gas Solubility Measurement for Waxy Crude Oil Saturated with Nitrogen and Natural Gas H.Y. Li, Y. Zhang and H. Wang	603
Pressure Vessel CAPP Management System Research Based on Network Y.S. Sun, W.S. Hao, Z.Q. Ma, X. Zhang, G.W. Qi and P. Lu	607
Φ311 Automatic Vertical Drilling System S.Q. Xu, R.M. Chen, C.Y. Ai, Z.H. Song, J. Ma, Z.J. Mu, X.J. Xu and G.Q. Hu	611
BEM Numerical Modeling and Experimental Verification of Cathodic Protection for Offshore Structures Z.G. Lan, B.R. Hou and X.T. Wang	617
Contrast Study on the Radial Velocity of the Flow Field of the Hydrocyclones with Different Inlet Structures L.C. Ren, Z. Liang, J. Meng, L. Yang and J.L. Tian	624
Design of Downhole Oil-Water Cyclone Separator and the Study of Laboratory Experiment W.B. Cai, Y.G. Xu and Q. Zhang	630

Chapter 7: Other Related Topics

Study on the Characteristics of Elastic Wave Propagation in Corrugated Fiberboard Y. Ding, Z.H. Yu, S.Q. Zeng and G.Z. Li	637
The Evaluation of Cathodic Protection System Design by Using Boundary Element Method M. Ridha, M. Safuadi, S. Huzni, I. Israr, A.K. Ariffin and A.R. Daud	642
Preparation of Metallic Wear Particles Around Joint Prosthesis by Vacuum Ball Mill <i>In Vitro</i> M. Cheng, M. Dai and H.Q. Yao	648
Mutagenesis, Screening and Industrialization of High Avermectin B1a Producing Strains from Streptomyces Avermitilis Irradiated by ¹²C⁶⁺ Ion Beam S.Y. Wang, J.H. Chen, W.J. Li, J.P. Liang, Y.H. Bo, X.Q. Ma and J. Liu	652
Parameters Design and Performance Study of Fly-Wheel Type Cutter Machine M.Q. Zhao, H.Q. Tian and L. Li	656
On Edge-Balance Index Sets of the Graph C_nxP₆(n=3,4,5mod6) Y.R. Ji, A.J. Li and J.J. Yao	662
Simulation and Experiment Study on Three-Phase PFC Rectifier Using MC33262 W. Wu, D.G. Huang and J. Liu	666
Simulating and Testing on Trajectory for Bomb with Parachute under Low Altitude Condition Y. Jian, Y.Y. Tian and G.Z. Yu	670
The Comparison and Analysis of Pore Size Distribution between Cotton Yarn and Fabric J.F. Di, X.X. He, W.Q. Du and H.J. Qi	676
License Plate Localization Based on Machine Vision Y.H. Huang and S.Q. Zhao	680
Quantitative Fit Assessment of a Precontoured Fracture Fixation Plate: Its Automation and an Investigation on the Borderline Cases H.H. Harith, B. Schmutz, M. Schuetz, Y.T. Gu and P. Yarlagadda	685

Research on Aircraft Components Life Prediction Based on Grey Relational Analysis B.H. Jia and X.D. Lei	690
The Testing Stand Design and Parameter Determination of Pneumatic Seed Metering Device of No-Till Seeder M.Q. Zhao, Y.W. Hu and Y.Q. Liu	694
RAPD Analysis on Avermectin High-Producing Strain of Streptomyces Avermilis Irradiated by $^{12}\text{C}^{6+}$ Ions Y.H. Bo, S.Y. Wang, J.H. Chen and J.P. Liang	701
Zoobenthos Used in Water Quality Assessment in Songhua River in Harbin City J. Zhang, L. Ma, C.X. Ma and H.X. Yu	705
The Influence of Liquid Properties on Fabric Pore Size Distribution X.X. He, J.F. Di, W.Q. Du and H.J. Qi	710
Microstructure Evolution during Solution Heat Treatment of Semisolid Cast 2024 Aluminum Alloy S. Pannaray, S. Wisutmethangoon, T. Plookphol and J. Wannasin	714