

Table of Contents

Preface, Organizing Committee and Sponsors

Chapter 1: Chemical Materials

The Effects of Electroplating Conditions on the Morphology and Glucose Oxidation Performance of Cu₂O/TiO₂ M. Long, L. Tan and A.D. Tang	3
Synthesis, Adsorption Behavior of a Maleamic Acid Cross-Linked β- Cyclodextrin Polymer for Removal of Basic Fuchsin in Aqueous Solution X.M. Zhang, H.Z. Li, M.L. Cao and C.Y. Chen	9
Electrosyntheses of Poly(selenophene-co-3-methylthiophene) with Improved Thermoelectric Property in Boron Trifluoride Diethyl Etherate S.T. Wang, B.Y. Lu, J.K. Xu and W.Q. Zhou	17
Electrodeposition of Novel Cross-Linked Poly(methacrylic acid) Functionalized Poly(9-aminofluorene) Network Films D. Cheng, B.Y. Lu, W.Q. Zhou and J.K. Xu	23
3D-Braided Thick Composites Made by Simultaneous Outside-in and Inside-out Resin Infusion R. Chen, Z.D. Shan and F. Liu	29
The Effect of Acetate on the Electrodeposition of Manganese on Polycrystalline Au without SeO₂ Additives W.P. Li, X.L. Zuo, J.Y. Yang and S.T. Zhang	34
Numerical Analysis for Cavitation Intensity's Effects on the Extend Angle of Convergence-Divergence Nozzle F.H. Zhang, X. Su, C.L. Tang and L.W. Shan	41
Experimental Application of Salt Slurry in Talimu High Density Drilling Fluid Composed of KCl-Saturated Brine and Polybasic Alcohol L.J. Zhou and J.M. Feng	46
Preparation of 2,2-Dimethylol Propionic Acid J.W. Zhang and J.W. Liu	51
Reaction Routes for the Electro-Deoxidation of Ilmenite in Molten Salt X.L. Zou, X.G. Lu, W. Xiao and C.Y. Lu	58
A Study on Relationship between Orientation Evolution and Coarsening Behavior of Cu₆Sn₅ Grains Formed on Polycrystalline Cu Substrate M. Yang, X. Ma and M.Y. Li	64
Glass-Ceramics Obtained from Sewage Sludge and its Characteristics Affected by Alkalinity D. Wu, J. Zhang, X.W. Wen and H.L. Liu	70
Experimental Study of Urea Depositions in Urea-SCR System S.Z. Bai, S.G. Lang, K.P. Yuan, Y. Liu and G.X. Li	74
Synthesis and Characterization of A₂+B₄ Hyperbranched Polyesters with Hydroxyl End Groups H.A.M. Saeed, Y.A. Eltahir, Y.M. Xia and Y.M. Wang	80
Preparation of Polyamide 5,6 (PA56) Fibers and its Mechanical Properties Y.A. Eltahir, H.A.M. Saeed, Y.M. Xia and Y.M. Wang	86
Inhibition and Recovery of Nitrification during the Process of Sludge Reduction Induced by a Metabolic Uncoupler, 2,6-Dichlorophenol (2,6-DCP) D. Wu, X.W. Wen and H.L. Liu	92
Influence of Ethanol on the Interactions and Physical Properties of Binary Mixtures of 1-Ethyl-3-Methylimidazolium Based ILs at 298.15 K H.N. Saba, Y.M. Zhang and H.P. Wang	99
The Corrosion Evaluation Methodology of the Lock Gate C.H. Jiang, K. Fan, X.Y. Luo and L. Qian	105

Adsorption Behavior and Corrosion Inhibition of <i>S</i>-Benzyl <i>o</i>-Phenylenedioxidithiophosphate for Carbon Steel in Hydrochloric Acid Solution X.L. Zhang, X. Lin, B. Xie, L.K. Zou, S.S. Zhu, Y. Lu, J.S. Feng and Y.L. Li	109
First-Principles Study on the Surface Energies of Rutile TiO₂(110) vs (011)-2×1 Surfaces F. Yuan, S.X. Lu, W.G. Xu, H.F. Zhang and T. Ning	113
Optimization of Preparation Process of Essential Oil of Baokening Granule-β-Cyclodextrin Inclusion by Orthogonal Test F. Luo and S.B. Qiao	118

Chapter 2: Metal Materials and Alloys

Research and Empoldering of High Strength Weathering Steel S450EW J.S. Wang, P.Y. Shi, C.J. Liu and M.F. Jiang	125
Simulation of the Yield Strength of Mo Alloys at Both Room and Elevated Temperatures J. Fan, H.C. Cheng and M. Song	130
Preparation and Photocatalytic Properties of Iron Titanate Compounds X.F. Lei, X.X. Xue and H. Yang	136
Study on Laser Brazing for Copper X.H. Wu	141
Expansion Behavior and Microstructures of Hypereutectic Al-Si Alloys Subjected to Thermal Cycling X.W. Zhu, R.C. Wang and J. Peng	145
Fatigue Damage Evaluation Research of Aluminum Alloy Based on Energy Degradation X.D. Li, L. Zou, Z.T. Mu and G.M. Kong	150
Comparative Study of Copper Brazing with Ag-Cu-Zn and Ag-Cu-P Filler in Heat Treatment Furnace R. Wang and Y.J. Jin	154
The Research of Fatigue Properties of Steel Q235 Butt Welded Joint W.P. Ouyang, J. Zhang and X.D. Xu	158
Analysis of the Grain Refinement Mechanism for Commercial Pure Titanium by ECAP and SMAT X.M. He, S.S. Zhu and C.H. Zhang	162
Corrosion Behavior of 13Cr Steel in Different Temperature Z.C. Qiu, X. Liu and N. Zhang	168
Microstructure and Properties of AZ31B Magnesium-LY12 Aluminum Alloys Diffusion-Bonded Joint S.M. Du and Q. Qin	172
Research Progress of Mg-Re Alloys Q.A. Li, W.C. Liu and X.J. Song	178
Effect of Solution Treatment on Microstructures and Hardness of Mg-Gd-Y-Zr Alloy Q.A. Li, L.L. Chen, W.C. Liu, X.Y. Zhang and H.Z. Jiang	182
Basic Properties of Iron and Steel Making Dust X.B. Li, W. Wang, D.H. Zhang and L. Xiong	187

Chapter 3: Electronic Materials

Effect of Acetate on Electrodeposition of Manganese from Chloride Electrolyte with SeO₂ Additives W.P. Li, X.L. Zuo, J.H. Liang, J.H. He and S.T. Zhang	193
Molecular Dynamics Simulations of the Conductivity of Aqueous NaCl in the Presence of Sucrose and Electric Fields X.G. Li, S.A. Yang, M.J. Tang, J. Lei, H. Hu, H. Hou and B.S. Wang	200
Electron Transport in Zigzag Graphene Nanoribbons with a Tetra-Vacancy Complex: A Perfect Spin Filter W. Lu and S.H. Ke	207

An Effective N, N-Diethylthiourea as Accelerator for Microvia Filling via Copper Electrodeposition W.W. Ma and Y. Wang	214
Adsorption Mechanism Study of Magnetic EDTA-Chitosan on Cu (II) Ions of Solution R.H. Qin, F.S. Li, W. Jiang and L.Y. Hao	218
Preparation, Characterization and Conductivity of Solid High-Proton Conductor $\text{Na}_7[\text{CoW}_{11}\text{O}_{39}\text{Cd}(\text{H}_2\text{O})]\cdot 12\text{H}_2\text{O}$ L.Q. Chen, X.M. Lin, M.X. Zhu and L.M. Dai	224

Chapter 4: Nano-Scale and Amorphous Materials

Synthesis of Co_3O_4 Multilayer Nanosheet Material and its Promising Gas Sensing Property M.L. Yin and S.Z. Liu	231
Influence of Ultrasonic Time on the Preparation and Properties of LaCoO_3 Nanoparticles J. Dong, H.F. Shen, Y.M. Wang, Y.J. Lu and G.L. Fang	237
Avoidance of Forbidden DNA Nanorobots Configurations in Patterned Immobilization of other Materials V. Popov	244
Preparation of Carbaryl-Imprinted Capillary Monolithic Column for Screening of Carbaryl from Three Carbamates Mixture C. Zhang, J.R. Cai, Y.Q. Duan and L. Xu	248
Methylthiouracil-Templated Formation of the Fluorescent Silver Nanocluster and its Application to Bioimaging X.Q. Xu	256
A Facile and Efficient Method to Prepare Exfoliated and Reduced Graphene Nanosheets by Detonation Y.H. Guo, D.X. Zhuo, L.X. Wu, L. Ma, Z.X. Weng and R. Wang	260

Chapter 5: Biomaterials and Healthcare

Drug Sustained Release Multiple-Component Polymeric Microparticles Fabricated Using an Electrospray Process X.Y. Li, D.G. Yu, F.P. Jiang, K.J. Deng, Z. Du and X. Wang	269
Adsorption Behavior of Rhodamine B and Methylene Blue by Chemical Modified Cornstalk Biomass Q.L. Cao, Y.M. Zhao, X.Y. Wei and F. Luo	276
Pathogenic Fungi Induce the Expression of <i>Trichoderma asperellum</i> Cell Wall Degrading Enzymes in the Process of Mycoparasitism P. Yang	282
Prevalence of Allergy and Complications Caused by Jewelry among Higher Vocational College Students J.P. Yuan, D.D. Chen and P. Wan	286
The Effect of Food-Microorganism(F/M)Ratio on Gas Properties in Batch Biogas Fermentation with Walnut Peel J.H. Liu, W.D. Zhang, S.Q. Liu, X.L. Zhao, F. Yin, J. Liu, L. Xu, Y.B. Chen and H. Yang	291
Diversity and Distribution of Sulfate-Reducing Bacteria in Jilin Oilfield W.F. Song, D.S. Ma, Y.Y. Zhu, X.F. Wei and J. Wu	297
Cultivation and Regulation of Sulfate-Reducing Bacteria in Oilfield W.F. Song, D.S. Ma, Y.Y. Zhu, X.F. Wei and J. Wu	303
Application of Neural Network in Bioactive Prediction of Inhibitor of Thymidylc Acid-Based Synthetase X.H. Du and X.H. Wang	308

Chapter 6 Mechanical Materials and Engineering

Study on Fault Rule Prediction of Hydraulic System and its Accessories of Shipborne Aircraft	
L. Li, C.Y. Wang, P.Z. Zhao, X.D. Li and H.Q. Zhao	315
Analysis of Welding Residual Stress on Cracked Vessels with X-Ray Diffraction Method	
J.M. Zhou and Y.L. Zhang	318
Energy Consumption Performance Study of New S-Shaped Hysteretic Damper	
C. Xu, Y.F. Niu and Y.X. Zhao	324
Adhesive Mechanism and Experimental Study on Shear Adhesive Strength of Impact Ice	
R.R. Wu, C.L. Zhu, C.X. Zhu and B. Miao	330
Design of the Hydraulic System of Lead Plate Coiling Machine	
H. Sen, R.B. Yuan and R. Li	336
Influence of Vibration on Thermomechanical Property and Transformation Behavior of TiNi Shape Memory Alloy	
A.S. Zheng, R.H. Li, P.S. Zheng and G.Y. Fu	341
The Design and Development of a Single-Axle Parallel Hybrid Powertrain Test Platform	
Q. Sun, C.C. Ma, Q. Miao and G.X. Li	346
The Research of the Rolling Element Bearing Fault Signal Frequency Domain Feature Extraction Method Based on the Wavelet Packet Decomposition	
S.Y. Qiu and R.B. Yuan	351
The Influence of the Diameter Ratio between Rigid Body and Particle on the Impact Strength Exerted on the Rigid Body Impacting Particles	
J.D. Lu, L.H. Li and G.M. Zhang	357
Research on Perovskite Catalysis for Diesel Engine Exhaust Removal	
P. Liang, Q.Y. Chen and H.B. Long	363
Research on Operation Mechanism and Application in Engineering of UNITANK Process	
D.J. Bao, J. Li and P. Zhang	370
Thermodynamic Analysis of the Internal Melt-Ice-on-Tube during Melting under Natural Convection	
Y. Liu and X. Chen	375
Introduction of a Thermal Response Test (TRT) Apparatus Used for Measuring Underground Heat Exchanger Characteristics	
Y. Liu, Y. Shi and Y.N. Zhang	381
The Application of Paste Tailing Technology in High Latitude Cold Area	
B. Zhou, X.W. Zhou, Y. Chen and Z. Chen	386
Elastic Modulus Influence on the Forming Precision of Grinding Tool Bended for the Aspherical Surface Grinding	
C.M. Shang, D.M. Zhang and J.D. Yang	391
Rotating Angle Error Influence to Grinding Aspheric Optical Component	
C.M. Shang, D.M. Zhang and X.M. Zhang	396
Effect of Carding Plate Gauge under the Licker-in of Carding Machine on Polyester Yarn Hairiness	
X.Z. Yu and P.Z. Sun	400
Design and Trial-Production of Emergency Power Supply System Battery Based on Chemical Hydrogen Production	
C.H. Xiong, Y.J. Zhou, F. Zheng, G. Wang and F. Wang	404
Complex Image Recognition Method of Train Wheels Based on Contour Feature	
D.Y. Jia and P. Hu	409

Chapter 7: Structural Materials and Civil Engineering

Study on the Effect Evaluation of Spinescence Application on Segregating Gratings of Expressway - Taking Wu (Ding) – Kun (Ming) Expressway as Example	
Y.W. Li, Y. Shen and Q. Meng	419
Comparison Study of Structural Stabilities for H-Section Columns Built with Ordinary Grade Strength Structural Steels According to Boundary Conditions and Lengths at High Temperature	
I.K. Kwon	424

Bridge with Lead Rubber Bearing Finite Element Analysis Based on ANSYS Y.X. Chen	428
Numerical Simulation on a Deep-Foundation Pit of Shenzhen Holiday Plaza Project Y. Zheng	433
Piled Raft Structure Finite Element Analysis of Composite Foundation Settlement in Da XI Passenger Dedicated Line X.T. Ma and G.L. Liu	438
Fluctuations Response of Tall Building to Change of Aspect Ratio in Interference Building K.P. You, Y.M. Kim, J.Y. You and S.Y. Paek	444
Performances of Manganese Slag Cement Q.Z. Chen and D.Q. Liang	450
Historical and Cultural Connotation of the Architectural Wood Carving Ornament in the Ancestral Temple of Chen Family - With “Feast in Bronze Sparrow Terrace Held by Cao Cao” and “Jiantu Conference” as Examples Y.N. Chen	456
Lost Wax Casting Process Design of Artificial Jade Cup Basing on Blast Furnace Slag W. You, Y.M. Jiang, Q. Lin, X.X. Yu, P.F. Li and Y.G. Wang	462
Analysis of Sound Absorption Properties of Three-Leaf Microperforated Panel Absorbers without a Rigid Backing X.L. Gai, X.H. Li, R. Wu, B. Zhang and J.J. Zhao	465
Influence of Alkaline Activator on the Strength of Fly Ash-Cement Gel Sand Material H.Y. Huang, A.M. Gong and K. Yuan	472
Moulding Process Design of Artificial Purple Jade Ship Basing on Blast Furnace Slag W. You, S.S. Wang, Y.G. Wang, Q. Lin, X.X. Yu and P.F. Li	476
The Construction of City Complex Intelligent System Y. Liu	479

Chapter 8: Environment Protection and Sustainable Development

Nitrogen Oxides Reduction by Zeolite Sorbents in Manufacturing Use I. Pandová	487
Study on the Effect of Streambed Substrate on Invertebrate Diversity Z.W. Luo, W.Y. Wu and K. Le	491
An Extended-Range Hybrid Solar-Cell and Battery Powered Bicycle C.H. Chao	495
Experimental Study on Biogas Production by Mesophilic Fermentation with Dimocarpus Longan Pericarp L.J. Zhang, W.D. Lin, W.D. Zhang, F. Yin, X.L. Zhao, J. Liu, L. Xu, Y.B. Chen, S.Q. Liu and H. Yang	502
Research on Environmentally Friendly Water-Based Covering Ink and its Application in Scratch-Type Invoice Printing Y. Gong, B.Q. Huang and X.F. Wei	508
Study on Reuse of Power Lithium Ion Battery Recycling Y.X. Li, R.L. Guo, Y.Q. Zhang and D.S. Zhou	515
Safety, Heath, and Environment (SHE) Case for Oil & Gas Operating Company W.J. Yuan	520
Design and Development of the Environmental Protection Mobile Enforcement System Y.Q. Wang and Y.J. Zhao	526
Energy Consumption Performance Study of New Box-Shaped Hysteretic Damper C. Xu, Y.F. Niu and Y.X. Zhao	531
Assessment and Characteristics of Heavy Metal Contaminated Soil in the Vicinity of a Zinc Mine Dump Heaps H. Wang, H.B. Li, X.D. Lv, P.F. Wang and J.F. Ma	537
Application of the Head-Tail Method to Determine Irrigation Coefficient in Hongguang Irrigation District F.L. Zuo, W.H. Zhang, J. Gao, X.L. Bai, J.H. Nong, H.Q. Zhao and M.Q. Zhong	543

Calculation of Parameters of Crop Water Production Function of Jensen Model Based on Stochastic Particle Swarm Optimization Algorithm S.H. Chang and Z.H. Qie	548
Effects of Grazing on Reproductive Allocation of Elm in Horqin Sandy Land, Northeastern China Y. Tang and X.J. Wang	554
Water Resources Optimal Allocation in Middle Line of South to North Water Diversion Project of Hebei, China Using AHP-LP T.Z. Gao, C.C. Zhang and H.C. Pang	559
Study of the Differences between Vegetation and Soil Spectrum about Alpine Wetland Ecosystem J.M. Wang, K.L. Chen, X. Zhang and Z.X. Luo	565
Toxicity of Three Heavy Metal Pollutants of the Pharmaceutical Wastewater to Paramecium Caudatum Z.L. Gong, Y. Chen, Y. Yan, S.Y. Pei, D. Wu, M. Zhang and Q. Wang	571
Responses of Water Holding Characteristic of Crown Debris and Litter in a Cunninghamia Lanceolata Stand to Ice-Snow Damage Q.J. Li, Y.T. Hao, L. Xue and X.L. Hou	578
Study on Particle Breakage of Coarse-Grained Soil Based on Large-Scale Triaxial Test F.Y. Chu	585
The Research of Slope Stability Based on Unsaturated Soil Theory C.Q. Shao, N. Zhang and F.L. Lv	590

Chapter 9: Environmental Science and Engineering

Comparative Researches on the Provenances of Suspended Sediments in Different Reaches of Dongtiaoxi and Xitiaoxi Watershed Z.P. Lu, X.Y. Yuan, H. Wang, H.L. Chen and W.W. Xu	597
Introduction to Midas GTS Software Application in Design of Deep Foundation Pit X.L. Dong	604
An Overview of Different Distillation Technologies for Drinking Water Preparation L. Liu and H.L. Wang	607
Erosion Experiment of Self-Excited Oscillation Pulsed Jet C.L. Tang, J. Pei, D. Hu and X.T. He	614
Ozon/Hydrogen Peroxide System for Degradation of Humic Acid in Water K.W. Kim and D.S. Rhee	620
Experimental Study on Dynamic Characteristics of Self-Excited Oscillation Pulsed Jet C.L. Tang, J. Pei and D. Hu	624
The Study of Groundwater Modeling of Plain Area in Shiyang River Basin - I Groundwater System Conceptual Model Construction Y.F. Cheng, Y.H. Li, X.Q. Hu, J.D. Wang and S.C. Lu	632
The Study of Groundwater Modeling of Plain Area in Shiyang River Basin - II Groundwater Modeling and Validation Y.F. Cheng, J.D. Wang, Y.H. Li, X.Q. Hu and S.C. Lu	639
Removal of Heavy Metals from Contaminated Soils by Washing with Citric Acid and Subsequent Treatment of Soil-Washing Solutions L. Sun, H.Q. Liu, G.X. Wei, Z.H. Wu and W. Yang	646
Preparation of Calcium Silicate Using Hazardous Solid Wastes and its Application in Treatment of Phosphate-Containing Wastewater X.H. Zhu, Z. Zhang and J. Shen	652
Multi-Scale Analysis of Marine Environmental Situation in the Caofeidian Nearshore District Y.J. Zhao, M.C. Li and Y.Y. Cao	659
Garden Plants under Global Climate Change Q.J. Li, X.L. Hou, L. Xue, H.Y. Chen and Y.T. Hao	663
The Nutritional Status of Waters and Origin Analysis of the Xitiaoxi Tributaries H. Wang, X.Y. Yuan, Z.Y. Li, H.Y. Xu and H.L. Chen	669

Chapter 10: Computation and Management Engineering Application

The Evaluation in Fuzzy Matter-Element Theory Based on Hybrid Weight D.Y. Jia and S.X. Zou	679
RETRACTED: ALB: A Methodology for the Simulation of the Producer-Consumer Problem C.A. Xu	686
Analysis of Relaxation and Relaxation Training on Sprint Performance Impact P. Wang	691
A New Method and Applications of the Boundary Value Problem of Differential Equation H.E. Li, X.X. Dong, S.C. Li, D.D. Gui and C.Y. Fan	695
Changchun College of Architecture Electrical Design for Sheling Campus Library T.T. Li	700
Optimized Research for Mobile Communication Strategy Based on Parallel Computing J.W. Zhang and Y.L. Yao	703
The Stochastic Imperfection Method of Sheet Space Structure Based on Truncated Univariate Normal Distributions T.J. Jin and X.M. Guo	707