

Table of Contents

Preface and Organizing Committee

Chapter 1: Materials Engineering

The Synthesis of Ag Doped TiO₂ Powders and Enhanced Photocatalytic Activity for Degradation of Organic Dye in Waste Waters L.M. Jiang	3
Investigation on the Microstructures and Tensile Properties of TA15 Titanium Alloy Thick-Wall Parts Formed by Laser Rapid Forming Process M.Z. Xi	7
Formation of Titanium Oxide by Thermal-Electrochemical Process on the Blasted Titanium Alloys Substrate R.D. Ramdan, J.R.P. Djuansjah, M.R.A. Kadir, H. Nur and E. Hamzah	12
Characterization of ZnO Thin Films Fabricated by Atomic Layer Deposition with Various Temperatures T.C. Li, R.C. Chang and P.S. Jhu	18
Mo Content on Wood Colored Electro-Less Plating Ni Color Influence Y.F. Pan and J.T. Huang	24
Structural and Electronic Properties of ZnO NANOCCLUSERS: A B3LYP DFT Study D.K. Pandey, P.S. Yadav, S. Agrawal and B.K. Agrawal	29
Analysis of Nanocrystal of Porous Silicon with High-Resolution Transmission Electron Microscopy J.M. Lu and X. Cheng	34
Influence of Particle Size of TiO₂ Powder on the Energy Conversion Efficiency of a Dye-Sensitized Solar Cell N. Bilgin, J. Park and A. Öztürk	39
Production of Highly Efficient Photocatalytic TiO₂ Powders by Mechanical Ball Milling T. Oztas, J. Park and A. Öztürk	44
Fast Detection of Local Anesthetic Ropivacaine by Impedance Method on Polypyrrole-Graphene Oxide R.J. Wu and M.Y. Chen	49
Improved Dark Current Properties in Bi-Layer Structured Organic Photodetectors N. Ohtani and S. Majima	54
Preparation of β-Phase Silicon Nitride Powders J.L. Wang, J.M. Liu and S.X. Ren	58
The Focus of Beam Using Optical Transformation G.X. Yu, X.Y. Yu and L.J. Xia	61
The Nature of Rest Silanol Groups on the Surfaces of Silica Based Solid Phase Extraction Materials A.A. Christy	66
Simulation of the Hydrogen Permeation Behavior of X80 Pipeline Steels in H₂S Saturated Environment by Cathodic-Charging Method F. Huang, W. Yuan, Q. Hu, J. Liu and Y.M. Qu	72
The Effects of Processing Parameter on Melt-Blown Filtration Materials Q.Y. Xu and Y.M. Wang	78
Recent Progresses on Some Coke Resistant Ni-Based Catalysts for Carbon Dioxide Reforming of Methane H.T. Jiang, W. Hua, H.Q. Li and Y.C. Dai	85
Numerical Simulation for Microstructure Evolution in In718 Alloy During Cylindrical Cup Backward Extrusion X. Hu, R.B. Mei, F. Zhu, Y. Fan, Y.B. Liang, X.B. Wang, D.G. Wang and Z.R. Jing	92
Electrochemical Studies on Photoactively Conducting Poly(4-aminoazobenzene) Coating: Electrochromic Property H.Y. Huang, J.C. Lin, J.M. Yeh and Y.C. Chou	98

Amino-Functionalized Multiwalled Carbon Nanotubes for the Preparation of Electroactive Polyurea Composites with Improved Electrical Properties L.C. Yeh, T.C. Huang and J.M. Yeh	103
Sol-Gel Derived Mesoporous Silica Nanoparticles under Base Catalysis for Uses as Anti-Reflective Coating Layers V. Loryuenyong, K. Boonsiri, V. Ketkeaw, U. Phuangkeaw and A. Buasri	108
Effects of Carbonization Temperature and Nanoporous Silica Templating on the Synthesis of Porous Carbon from Commercial Sugar A. Buasri, C. Pholprasert, N. Suwunnakee, T. Phuchainan and V. Loryuenyong	113
Study the Method of the Polyester Short Fiber-Nature Rubber Composite Mix C.J. Liu, X.Z. Han and S.T. Su	119
Simultaneous Removal of SO_x and NO_x in Flue Gas at Power Stations over a Cu/Na-13X Zeolite Catalyst H.T. Zhao, T. Wu, J. He, S. Kingman, K.Q. Shi, D. Shen and Y.Y. Zhang	125
Research on the Stability of the Paste-Like Silicone Impregnant W.J. Gu, Y. Li and J.K. Liu	130
Experimental Investigation on Viscosity of Nanofluids X.J. Wang, Z.F. Wang and Z.Z. Li	134
Experimental Study on Ball-End Milling of C/C Composite C.W. Shan, Y. Zhao and D.P. Cui	139
Synthesis of Silicon Thin Film by Electrodeposition from Ionic Liquid J.S. Park, J.J. Park, K.J. Kwon, H.S. Kim and C.K. Lee	145
Near Infrared Spectroscopic Study on the Adsorption of Methanol on Silica Gel A.A. Christy	150
The Unique Organic Microfertilizer as the New Prospective Compound for Agroecology M. Gilmanov, A. Yrezhepov, N. Dosbaev, S. Ibragimova and A. Esmambetov	156
Study and Characterization of TiC/Fe Alloys by Gel-Casting T. Lin, S.Y. Lv, S.L. Li, Y.L. Shi and H.P. Shao	162
Electronic Structure of Erbium Silicates Investigated by First-Principles Method Y.B. Liu, L.G. Wang, C. Zhang, L.M. Wang and L. Wang	167
A Neural Network Model of Restrained Recovery for Shape Memory Alloys S. Wu, S.G. Zhao, D.F. Wu and X.M. Yu	172
Magnetic Field-Induced Granular Pearlite at Early Stages of Phase Transformation X.L. Zhou, K. Han, Z.M. Ren and Z. Li	178
The Effect of Sn on Microstructure and Mechanical Properties of Mg-Li-Zn-Sn Alloys C.J. Jin, R.Z. Wu, J.H. Zhang and M.L. Zhang	185
Synthesis of Silica Microspheres Filler for PDMS W.J. Gu, Y. Li, X.H. Zhang and H.B. Li	190
Effect of Isothermal Aging 2000 Hours on Intermetallics Formed between Ni-Pd-Au with Sn-4Ag-0.5Cu Solders M.A.A. Hanim, A. Ourdjini, I.S.R. Aisha and O.S. Azlina	194
Synthesis, Structural and Photoelectrical Properties of Self-Assembled Gold-Poly(3,4-Ethylenedioxythiophene) Nanowires and Nanocables B. Sun, Y.Z. Long, M.M. Li, X.J. Hu, Y.Q. Qi, S.Y. Zhou and P. Chen	200
Relationship between Binder Content and Ink Absorption of Coated Paper Y. Li, W.J. Gu and B.H. He	206
The Research of the Wc-17co Abrasion-Resistant Coating by the D-Gun System on the Aluminium Alloy Substrate X. Wu and Z.M. Guo	211
Stress Relaxation of Ion Exchanged Float Aluminosilicate Glass at Different Temperature L.B. Jiang, X.Y. Li, X.T. Guo, L. Li, G.L. Zhang and Y. Yan	216
Preparation and Characterization Glass Fiber Reinforced BMI/DABA/KH550 Composite N. Ali, Y. Wu, Q.Y. Zhang and Y. Chen	220
Fabrication and Characterization of Ag Nanoparticles Loading pH Sensitive Polymer Composite Microspheres X.Q. Wang, X.Y. Liu and L.S. Zha	226
Experimental Study on Adsorption Mechanism of U(VI) by Modified CMC S.K. Zhou, G.M. Zeng, Y.J. Liu and H.Y. Jiang	231

Photo-Oxidation of PVC-Coated Membrane Material X.D. Yang, Y.S. Yan and W.C. Qiu	238
Degradability Research of Nano-PLLA/Chitosan Composite Scaffolds L.Y. Lv, X.J. Wang, T. Lou, C. Sui and G.J. Song	245
The Effects of Natural Dopant Acids on Morphologies and Antibacterial Activity of Polyaniline J.L. Mu, W.J. Fan, S.Y. Shan, T.W. Hu, Y.M. Wang and Q.M. Jia	249
T-Ray NDE Inspections on the Fiber Direction of Thermoplastic PPS-Based CFRP Composites K.H. Im, D.K. Hsu, C.P. Chiou and D.J. Barnard	253
Study on the Leaching Performance of Chrome in Waste Leather Products S.L. Ding, Q. Xiang and L. Zhu	258
Abnormal Diamagnetic Respond in $\text{Co}_{0.2}\text{Mn}_{1.7}\text{Sn}$ Compound W.J. Feng, H.H. Zhang and Y. He	264
Investigation of Au Nanoparticles Loading Temperature Responsive Hybrid Microgels C. Lu, X.Y. Liu and L.S. Zha	268
Research on Microbial Degradation of Bamboo Lignin for Extraction of Natural Bamboo Fiber H. Li, G.Y. Zhou, J. Liu and S.J. Wang	273
Smart Efficient Flame Retardant Carpets in Non Halogen Flame Retardant Polymers X.D. Lin, B. Yang, G.K. Wang, E. Bakangura, M. Huang and Z.S. Fan	279
Study of Adaptability of the Compound of Sulfonate Acid Water Reducing Agent with Ceramic Slurry Blank C. Ye, C.X. Shi, Q.C. Liu and Q. Xia	285
A Study of Coating Surface Microstructure and Characteristics of Coated Paper Related to Binder Y. Li, W.J. Gu and B.H. He	292
Low-Energy Impact Damage Mechanism Analysis of FRC Laminates Y. Xu, W.D. Wen and Y. Huo	298
Sprayed Concrete – Possibilities of Testing Sprayed Concrete Prepared in Laboratory A. Hubáček, R. Hela and T. Helan	304
Experimental Methods of Synthesis of Nano-/Macro Mineral Materials A. Kuzyura, T. Setkova, D. Chareev, A. Spivak, E. Kozlyakova, V. Osadchii, M. Voronin and E. Osadchii	308
Preparation of Magnetic Fluids Based on Associated Polymers A. Barabanova, A. Shibaev, V. Molchanov, O. Philippova and A. Khokhlov	314
Evaluation of Strength Characteristics of Fibre-Cement Slab Material J. Melcher, M. Karmazínová and M. Pilgr	320
Research on Friction and Wear Properties of $\text{Ti}(\text{C},\text{N})/\text{Fe}$ Composites Y. Li, Z.P. Sun, R.F. Wang and L.Y. Zou	326
Study of Thermal Technical Properties of Lightweight Concrete with Utilization of Non Stationary Hot-Wire Method J. Zach, M. Hubertova and J. Hroudová	333
Grind Cullet and Silicate Coatings Z. Šnirch	340
Analysis on the Corrosion Failure of MDS Mine Multistage Centrifugal Pump Impeller X. Zhang, W.M. You, Y.J. Zhou, Y.S. Li and S.J. Qiu	344
Green's Function for Piezoelectricity with an Elliptical Inclusion in Multi-Field Circumstance L.C. Dai and J.J. Gong	350

Chapter 2: Mechanical Engineering

Multifunctional Integration Equipment Design and Construction Technology Research J.B. Guo, J. Chen, J.Z. Liu and J.C. Niu	359
Dynamics Analysis and Modeling of a Hexapod Robot with Single Drive H. Xie, X.H. Wang, T. Wang, Y.M. Zhao and L.B. Zhang	364

The RPR Group in Mechanism Analysis and Design System X.J. Li, Y. Xi and X. Wang	369
System Optimization for Prism Based Stereovision X.Y. Cui, K.B. Lim, W.L. Kee and Q.Y. Guo	374
J-Integral Evaluation for Calculating Structural Intensity and Stress Intensity Factor Using Commercial Finite Element (FE) Solutions J.W. Hu	379
Analysis of Hybrid (Hydrodynamic/Hydrostatic) Journal Bearing V.K. Dwivedi, S. Chand and K.N. Pandey	385
Optical Triode Based on Electrically Induced Quadratic Cascading in an Optical Superlattice D. Huang, D. Wang and Y.Q. Wang	391
A Study on Double Plus Chain Mechanism for Li-Ion Power Battery Formation Equipment L. Han, F. Xiao and L. Zhou	398
The Study of Current and Voltage Needle for Li-Ion Battery Formation L. Han, F. Xiao and S.W. Wang	403
Comparison of Various Object Stress Rates under Simple Shear D.K. Kim and J.W. Hu	407
Numerical Study of Improving Aerodynamic Performance of the Cylinder Airfoil of Magnus Wind Turbine Q. Yao, Y.X. Yao, L. Zhou, J.M. Wu and J.G. Li	414
Kinematic and Dynamic Stress Analysis of the Structural System of Wheel Loader Based on the Rigid-Flexible Coupling X.J. Zheng, C.Q. Yuan, X.H. Chang, Y.P. Li and X.W. Gao	420
A Study on the Testing System and Method for Li-Ion Power Battery L. Han, F. Xiao and Y.M. Liu	426
Research and Development of Measuring Equipment for Treadmill Exercise Energy Transfer Z.J. Chien, H.P. Cho, C.S. Jwo and C.C. Chien	431
Study of a Model for the Evaluation of the Heat Losses from Electric Cables Buried According to the Norm Standard R. de Lieto Vollaro and A. Vallati	437
Time-Frequency Correlation Method for Improving the Accuracy in Detecting Leaks in Pipelines V.S. Avramchuk and V.I. Goncharov	443

Chapter 3: Mechatronics and Control

An Autonomous Navigation Algorithm Using Geomagnetic Sensor and Star Sensor C.M. Chen, B.H. Li, C.H. Wang and R. Liu	449
The Research of Real-Time Trajectory Interpolation Based on Open Numerical Control System J. Li, M.L. Wang and H.J. Hao	455
Highway Traffic Incident Detection and Optimal Sensor Placement Layout L. Bai, Q.S. Wu, M. Yang, L.X. Wei, B. Li and R. Gao	460
A Hybrid Authentication Protocol with ID-Based Signcryption for Vehicular Ad Hoc Networks J. Zhang	465
Comparative Study on Multiobjective Power Unit Coordinated Control Problem via Differential Evolution and Particle Swarm Optimization Algorithms Z. Zaharn, R.F. Shi and X.J. Liu	470
Composite Grinding Machine Asynchronous Electric Spindle Direct Torque Closed-Loop Servo Control Research T. Lan, Q.S. Han, B.Y. Peng and S.W. Hu	476
Development of a Sensor to Detect Condensation of Super-Sonic Steam A. Khan, K. Sanaullah and N. Ul-Haq	482
Design of the Control System for Laser Guiding AGV Z.Q. Yu, X.H. Yin, Z. Cao, B.B. Yao, G. Liu and H. Zhao	488

Device for the Experimental Determination of Control Objects' Mathematical Models V.I. Goncharov, V.A. Onufriev and I.O. Ilyin	493
Some New Applications of MEMS in the Biomedical and Environmental Fields Y.J. Chen	498
Design of Ka Band Patch Microstrip Antenna Array on LCP Substrate S.L. Jia, B. Liu and Y.J. Zhao	503
Numerical Analysis of Bias Load on Integral Flotation Cushion X. Zhao, B. Liu and J.A. Zhang	506
Modal FEM Analysis Using Weak Form Equations for a Microgyroscope with Bulk Giant Magnetostrictive Material (GMM) Resonator L. Yang, F. Cui, W. Liu, X.S. Wu, W.P. Zhang and W.Y. Chen	513
Design of Multi-User Aerobics Wireless Human Motion Capture System Based on MEMS J. Xiao	518
Study on Post Processing for MIKRON Five-Axis Machining Center Based on Catia V5 Z.R. Feng, L.X. Wang and J. Wang	523
VME Bus-Based Multiprocessor Parallel Data Acquisition System R.G. Zhou, Y.F. Zhou and X. Chen	529
The Research of Direct Torque Control of Induction Motor Based on Efficiency Optimization Z.N. Min, X.F. Zhang and T.J. Zhong	537
A Soldering Defect Inspection System of a Special Integrated Circuit Board Based on Computer Vision C.L. Zhou, J.Q. Wu, Y.Q. Wang and Z.P. Xu	543
Researches on Image Distortion Correction Method Based on Image Magnification X.Y. Jiang, J.L. Xu, X.F. Fang, X.X. Zhang, Y.L. Peng and K.L. Fang	548
Gaze Recognition and Application F.M. Yu and T.C. Li	553
Remote Control System Design for Domestic Wall-Mounted Gas Boiler Based on GSM Modem J.P. Xu, X.Q. Ma and H. Shen	559

Chapter 4: Manufacturing Processes

An Innovative Experimental Setup for Laboratory Tests of Fine Blanking Process M. Shahsavan and M. Sedighi	567
Thermal-Elastic-Plastic Finite Element Analysis for Laser Welding Deformation of Thin Plate P. Zeng, L. Mei and L.P. Lei	572
Influence of Vibration Inclination on Surface Quality and Tool Wear by Ultra-Precision Vibration-Assisted Cutting A. Al-Zahrani, J.R. Yang and Y. Li	577
NDE Inspections and Simulation of Defects in Composite-Sintered Bushes K.H. Im, K.Y. Kim, K.T. Shin, H.H. Lee, T. Kang, H.J. Cho and J.A. Jung	582
The Experimental Investigation of WEDM for Surface Roughness of Hardened Tool Steel: SKD 61 K. Kosit and K. Jirapattarasilp	588
The Application of Virtual Reality Technology on Modern Sports Y.W. Liu	593
Effect of Milling Parameters and Coolants on Surface Hardness of Tool Steel: SKD 11 A. Inkhamnoi and K. Jirapattarasilp	596
Study of Metallurgical Properties in the Sintered Ore with Variable Carbon Y.L. Li, Q.J. Zhang, J.G. Liu, L.M. Jiang, W.L. Mo and Y.Z. Zhang	602
The Study of Surface Finish in Face Milling of Stainless Steel: AISI 304 S. Luejanda and K. Jirapattarasilp	606
Effect of Post Weld Heat Treatment on Carbon Steel AISI 1050 in Heat Affected Zone P. Peasura and L. Sumarn	612
Effect of Riveting Parameters on Strength of Aluminium Joint T. Sripunchat and K. Jirapattarasilp	616

Exploitation and Application of the Middle Thickness Model in Cold Tandem Mill L.L. Zhou, X.C. Ma, K. Wang and H.X. Si	623
Gasifying Kinetics Analysis on Mixing Municipal Solid Waste and Sludge S.T. Kong, P. Cai, L.J. Zhao and J.T. Wei	629
The Optimization Program of Reverse Circulation Drilling Equipment X.H. Xue and Z.M. Su	634
BAS Municipal Wastewater Advanced Treatment Process Q. Wu, Q.W. Song, L.Y. Jiang, J.G. Dai, H.L. Wang and S.W. Wu	638

Chapter 5: Civil and Environmental Engineering

Differents Methods to Estimate the Mean Radiant Temperature in an Urban Canyon R. de Lieto Vollaro, A. Vallati and S. Bottillo	647
Quality Evaluation of Jajrood River (IRAN) by Quality Indices Methods M. Mirzaei and H. Hasanian	652
Land Use/Cover Classification over Small Areas Using Conventional Digital Camcorder Imagery Based on Frequency-Based Contextual and Neural Network Classification Techniques H.S. Lim, M.Z. Mat Jafri and K. Abdullah	658
Analysis Development Status of A12 Reservoir L. Zhang and G.M. Liu	664
Bracing Systems for Seismic and Wind Performance of Tall Buildings D.K. Kim and J.W. Hu	667
The Role of Facade Angle in Gaining Solar Energy (Case Study: Iran, Bandar-Abbas) V. Shaliadini, M. Matin and H. Ghaedi	673
Designing a Sustainable Planting Module for Extensive Green Roofs under the Tropical Climate Y.J. Lin, C.Y. Sun and H.T. Lin	677
Water Flooding Curve in Determining the A Reservoir Water Flood Sweep Efficiency L. Zhang	681

Chapter 6: Product Design and Engineering Management

Consumer Lifestyles and Preferences for Sofa Leather T.L. Chen, Y.K. Chou and A. Hsu	687
Optimized Product Design Methodology: A Combinatorial Reverse Logistic Cost-Benefit Analysis Model of WEEPs J.L. Huang	692
Development of an Adjustable Physical Mockup Used for Design Validation of Passenger Car Ergonomics and Interiors C.L. Sang, J.D. Ren, Y.Q. Liu, M.D. Mi, S.H. Li and X.X. Gao	698
A Framework for Evaluating the Performance of RFID-Enabled Supply Chain P. Wang, S.S. Zhu and X.H. Wang	705
Methods of Evaluation on Manufacturing Information Quality X.Z. Lu and C.P. Zou	711
Measurement of Physicochemical Property and Flavor Compounds of Hawk Tea Yogurt M. Zhang, M. Ye, D. Liu and Y. Liu	717