

# Table of Contents

## Preface, Organizing Committees

## Part 1

### I. Structural Materials

|   |    |
|---|----|
| <b>Study on the Sewage Treatment by SBBR-BAF Filled with Ceramic Filling</b><br>W. Li, W. Wei, Y. Liu and T.J. Wang   | 3  |
| <b>Research on Drag Reduction Effect of Concave Non-Smooth Surface in Air</b><br>Z. Xu, S.Z. Li, X.Y. Wu and X.J. Zhao  | 7  |
| <b>Numerical Analysis of Hydrodynamic Lubrication on Water-Lubricated Rubber Bearings</b><br>Y.Q. Wang and C. Li  | 12 |
| <b>The Effect of CF Modification on the Flexural and Tribological Properties of PTFE Composites</b><br>W.X. Wang  | 17 |
| <b>Evaluation of the Friction and Wear Properties of PEI Composites Filled with Glass and Carbon Fiber</b><br>C.L. Cai  | 21 |
| <b>Research on Process Parameters Optimization of Squeeze Casting for AZ91D Magnesium Alloy</b><br>H. Xu and T.S. Li  | 25 |
| <b>Research on Energy Absorption Characteristics of Honeycomb Sandwich Panels</b><br>S.J. Hou, L.L. Ren and D. Dong   | 30 |
| <b>Corrosion and Protection Studies of N80 Steel in CO<sub>2</sub> Solution</b><br>X.Q. Huang, J.S. Zheng, R. He, J.R. Liu, H.P. Bai and Y.Q. Tu  | 34 |
| <b>Study on Distribution of TiC Particles in Molten Steel under Electromagnetic Stirring Condition</b><br>S.B. Bin, S.M. Xing and P.W. Bao  | 38 |
| <b>Characterization and Analysis of Ethylene-Propylene Copolymers</b><br>H.B. Wang, D.M. Yue, Y.K. Gao and S.Z. Wu  | 43 |
| <b>Negative Thermal Expansion of Gd<sub>2</sub>Fe<sub>16.5</sub>Cr<sub>0.5</sub> Compound with Th<sub>2</sub>Ni<sub>17</sub>-Type Structure</b><br>Y.M. Hao, F.F. Liang, X.H. He, W.Y. Zhao, Y.T. Qin and F. Wang | 47 |
| <b>Local Stress-Strain Method for the Effects of Scratch on Fatigue Performances of Cabin Glass</b><br>H. Ding, Y.T. He, J.Q. Du, L.M. Wu, H.W. Zhang and Q. Shao   | 51 |
| <b>Research on Substitution of Molybdenum by Manganese in Low Alloyed Bainite Ductile Iron</b><br>D.Q. Wei and K. Liu   | 57 |
| <b>Effect of Minor Compressive Deformation in Austenite on Martensitic Transformation in Modified 9-12%Cr Ferritic Steel</b><br>C.X. Liu, Y.C. Liu, D.T. Zhang, Z.Z. Dong, B.Q. Ning and Z.S. Yan                 | 61 |
| <b>The Investigation on the Non-Contact Treatment of the Metal Surface Layer by Using Strong Pulse Electromagnetic Field</b><br>M. Gao, L.L. Zhang, T. Huang and M.R. Lv  | 65 |
| <b>The Phase-Field Simulation of the Grain Growth under External Field</b><br>L.L. Zhang, M. Gao and S.N. Tang  | 69 |
| <b>Advanced Stab Resistance Fabrics Utilizing Shear Thickening Fluids</b><br>Z.Y. Song, C. Zhang, M. Song and S.Z. Wu   | 73 |
| <b>Influence of High Current Pulsed Electron Beam Irradiation on Ni-P Electroless Plating</b><br>Y. Xu, S.Z. Hao, X.D. Zhang, M.C. Li and C. Dong   | 77 |
| <b>Properties of Nanocrystalline Aluminium Fabricated by Warm-Vacuum-Compaction Method</b><br>W. Liu and Q.H. Zhou  | 82 |

|   |     |
|---|-----|
| <b>Evaluation of the Friction and Wear Properties of PA6 Composites Filled with Nano-SiO<sub>2</sub></b><br>W.X. Wang and J. Li   | 86  |
| <b>Dynamic Strain Aging Induced by Cyclic Deformation in Two Magnesium Alloys</b><br>L.J. Chen, J. Li, F. Li and X. Wang  | 90  |
| <b>Superplasticity of AZ91 Alloy ECAPed with Different Routes</b><br>F. Li, S. Guo, X. Che and L.J. Chen  | 94  |
| <b>Study of Epoxy Resin Emulsion by Emulsion Graft Polymerization</b><br>R. Mu, L.L. Dai, S.L. Fan and A.M. Deng  | 98  |
| <b>The TPB and Tribological Properties of Short Carbon Fiber Reinforced Polyimide Composite</b><br>Z.Y. Cai and J. Bao  | 102 |
| <b>Preparation of High Surface Area Anatase TiO<sub>2</sub> by a Low Temperature Hydrothermal Process</b><br>M.Z. Gao, Z.R. Zhang, W. Li, W.B. Liu and B.J. Yang                                  | 106 |
| <b>Numerical Simulation on the Surface Subsidence Effect during Shield Tunneling Construction</b><br>H.X. Sun, H.Y. Wu and S.L. Chen  | 110 |
| <b>Calculation of Statistical Values (S') of Phase Structure Formation Factor (S) and Application to Solidification Theory of Cast Iron</b><br>Z.Y. Gao, W.H. Xue, X. Ren, Y.J. Sun and S.B. Yang | 114 |
| <b>Synthesis and Properties of Cerium Oxide Nanoparticles</b><br>Y. Li, J.G. He and X.W. Huang  | 118 |
| <b>The Study on Precipitation Characteristics in 6082 Aluminum Alloy with Cu Addition</b><br>M. Jin, C.F. Xia and G.J. Shao   | 122 |
| <b>Effect of Asynchronous Rolling on Deforming Texture in Al Alloy 6111</b><br>Y. Chen, Q.M. Gao and N. Tian  | 127 |
| <b>Effects of Heating Methods on Recrystallization Texture of an Al-Mg-Si Alloy</b><br>Q.M. Gao, Y.Z. Liu and N. Tian   | 131 |
| <b>Experimental Research on the Fracture Properties of Roller Compacted Steel Fiber Recycled Concrete</b><br>Y.D. Jia, Z.W. Zhou, Y.D. Qu and A.S. Tian   | 135 |
| <b>Microstructure and Mechanical Properties of Al-Mg-Sc Alloy Processed by Semi-Solid Continuous Casting-Extrusion</b><br>X.F. Zhang, R.G. Guan, T. Cui and T.G. Zhou                             | 139 |
| <b>Research on the Nanophase Reinforce Cu Alloy</b><br>M. Zhao, H.X. Wang, G.C. Jin and J.H. Yu   | 143 |
| <b>Calculation of Statistical Values of Phase Interface Valence Electron Structure Parameters of Cu-Zn Alloy</b><br>F. Li and X. Zhao   | 147 |
| <b>Analysis of the Effect of Nitrogen on Cold Shortness Behavior of Steel with the Electron Structure Parameters of Phase Interface</b><br>G.L. Yin, D.L. Yi and C. Lin                           | 151 |
| <b>Effects of the Valence Electron Structures of Nitride on Cold Shortness in Steel</b><br>L.D. Zhou, G.W. Chen and G.L. Yin  | 155 |
| <b>Influence of Different High Temperature and Heated Time on Properties of Concrete</b><br>A.S. Tian   | 159 |
| <b>Effect of Process on Microstructure and Elevated Temperature Mechanical Behavior of Multi-Phase NiAl-Fe(Nb) Alloy</b><br>P. Han and J.T. Guo   | 163 |
| <b>Microstructure and High Temperature Mechanical Property of Directionally Solidified NiAl-Cr(Mo)-W/Nb Alloy</b><br>Y.H. Qi, S.N. Ma and J.T. Guo  | 167 |
| <b>Study on Photocatalytic Performance of F-Doped Nanometer TiO<sub>2</sub></b><br>S.F. Yan and T. Sun  | 171 |
| <b>Effect of Temperature and Grain Size on the Corrosion Behavior of 316L Stainless Steel in Seawater</b><br>S.S. Xin, J. Xu, F.J. Lang and M.C. Li   | 175 |

|  |     |
|--|-----|
| <b>Electrochemical Corrosion Behavior of Laser Gas Nitrided Layer on the NiTi Shape Memory Alloy in Hank's Solution</b>              | 179 |
| S. Zhang, H.J. Tang, F. Hu, C.H. Zhang, H.C. Man and Q.Q. Zhang  |     |
| <b>Microstructure and Hot Corrosion Properties of Laser Cladding of a Co-Base Alloy on the Leaf Surface of Gas Turbine</b>           | 183 |
| S. Zhang, G.Y. Zhou, F. Hu, C.H. Zhang, M.C. Wang and Q.Q. Zhang   |     |
| <b>Study on Wear and Corrosion Properties of Ti6Al4V Alloy by Laser Gas Nitriding</b>  | 188 |
| C.H. Zhang, L.W. Tang, F. Hu, S. Zhang and H.C. Man  |     |
| <b>Study of WC Particles Dissolved by Plasma Surfacing</b>   | 193 |
| C.H. Zhang, L. Qi, F. Hu, S. Zhang and M.C. Wang   |     |
| <b>Study on Microstructure and Mechanical Properties of Hot Rolled Steel Plate Strengthened Complexly by Titanium and Molybdenum</b> | 197 |
| H.B. Wang, S.L. Li and C.T. Niu  |     |
| <b>Post-Process of Density Streaks Image of Flow Field in Supersonic Jet Device Captured by Laser Dual Hologram Interferometry</b>   | 202 |
| C.L. Liu, H. Jin and C.B. Huo  |     |
| <b>Effect of Mineral Mixture of Steel Slag and Blast Furnace Slag on the Properties of Cement</b>                                    | 206 |
| Z.S. Zhang, F. Lian, H.Q. Liao, L.H. Xu, X.Y. Li and H.N. Zhao   |     |
| <b>Anticorrosion Conversion Coating Content Lanthanum and Phosphate on Foam Mg Alloy</b>   | 211 |
| L.Y. Niu, Z.M. Shi, J.J. Lin, Y. Li, L.C. Xu and L. Zhao   |     |
| <b>Microstructure Development of Twin Roll Cast AZ31 Sheet in the Pre-Deformation Deep Drawing Process</b>                           | 215 |
| P.W. Bao, S.M. Xing and Z.M. Liu   |     |
| <b>Al-0.90%Fe Alloy Sectional Solidified in a Gradient Magnetic Field</b>  | 220 |
| J.F. Zhang, Q.X. Ba and J.Z. Cui   |     |
| <b>Experimental Confirmation of Ni<sub>5</sub>Al<sub>3</sub> Phase in Ni-Al Binary System by Diffusion Couple Technique</b>          | 224 |
| C.F. Li, Y.P. Ren and G.W. Qin   |     |
| <b>Simulation of Grain Growing Process of Zinc-Aluminium Alloy under High Pressure</b>   | 228 |
| Y.D. Qu, R.D. Li, Y.H. Bai, Q. Li, H.W. Yang and R.C. Wang   |     |
| <b>Influences of Acting Parameters of Electric Pulse Modification on the Al-22%Si-1.5%Cu Alloy</b>                                   | 233 |
| L.J. He, J.Z. Wang, J.G. Qi, H.L. Du, X.J. Liu and B. Wang   |     |
| <b>Microstructure and Micromechanical Property of C/C-SiC Composites</b>   | 238 |
| Y.Y. Cui, R.C. Bai, A.J. Li, M.S. Ren and J.L. Sun   |     |
| <b>Development of 360 MPa Grade Heavy Plate with High Performance</b>  | 242 |
| J. Li, X. Liu, B.X. Wang, J.B. Lian and W.G. Wang  |     |
| <b>Application on Statistical Value of Phase Structure Formation Factor to Fe-C Phase Diagram</b>                                    | 246 |
| W.H. Xue, X. Ren, Z.Y. Gao and H.F. Shi  |     |
| <b>Experiment Study Based on Nano-Ceramic Grinding Wheel Bond</b>  | 250 |
| J.Q. Zhang, Z.R. Pang, T.B. Yu and W.S. Wang   |     |
| <b>The Vehicle Dynamic Load Identification under the Excitation of Random Road Surface</b>   | 255 |
| L.P. Zhang and L.X. Guo  |     |
| <b>Effects of Elastic Modulus Degradation on Simulation of Stretch-Bend Springback of Dual Phase Steel</b>                           | 260 |
| C. Lu, Y.L. Kang, G.M. Zhu, R.D. Liu and L. Lin  |     |
| <b>Influence of Sn Content on the Microstructure and Dry Sliding Wear Behaviour of Hypereutectic Al-20Si Alloy</b>                   | 265 |
| X.F. Wu and G.A. Zhang   |     |
| <b>In Situ Observation of Solidification Behavior in a Q235 Steel by Using Electric Pulse Modification</b>                           | 269 |
| S. Dai, J.G. Qi, Z.F. Zhao and J.Z. Wang   |     |
| <b>Study on Inclusions in Ductile Cast Iron</b>  | 273 |
| W.T. Guo, G.W. Chang, S.Y. Chen and J.C. Wang  |     |
| <b>Measurement System of Contact Angle between Molten Steel Droplet and Refractory Material</b>                                      | 277 |
| X.L. Qiu, G.W. Chang, S.Y. Chen and J.G. He  |     |

|   |     |
|---|-----|
| <b>Crystal Growth during the Solidification Process of Continuous Casting Slab</b><br>S.Y. Chen, G.C. Jin, X.D. Yue, Q.C. Li and G.W. Chang   | 282 |
| <b>Control of Liquid-Drop Surface Shape in Melt</b><br>J.G. He, G.W. Chang, S.Y. Chen and X.L. Qiu  | 287 |
| <b>Crack Tip Opening Displacement of X100 SAWL Pipe</b><br>Q.R. Xiong, J. Liu, J.X. Zhang, Y.R. Feng and W.Z. Zhao  | 292 |
| <b>Effects of Pulse Electric Field on the Clusters of Pb-Sn Molten Alloy</b><br>Z.B. Zhang and J.Z. Wang  | 298 |
| <b>A New Wind Vibration Control Strategy Based on Active Variable Stiffness</b><br>J.K. Dong, X.Z. Wang and H.J. Sun  | 302 |
| <b>Factors Analysis of Non-Aqueous Electrolytic Extraction of Ultrafine Non-Metallic Inclusions</b><br>H.G. Li, Y. Gong, C.B. Yang, S.B. Zheng and Q.J. Zhai                                      | 306 |
| <b>Metallurgical Behavior of Adjusted Converter Slag in Reduction Process</b><br>M. Chen, Z. Tian, Q.X. Yu and Z.F. Gao   | 310 |
| <b>Web Reinforced AZ91 Composites with Enhanced Strength and Plasticity</b><br>J.B. Yang and K.Q. Qiu   | 314 |
| <b>Effect of Boron on Microstructure and Mechanical Property of High Grade Pipeline Steel</b><br>X.C. Tang, Y.L. Kang, Y.Y. Bo and L. Fan   | 319 |
| <b>Microstructure and Deformation Characteristics of X80 High Deformability Pipeline Steel</b><br>D.L. Meng, Y.L. Kang, S.Y. An and D.X. Xia  | 323 |
| <b>Theoretical Analysis of the Influence of the Electron Pulse Modification on Al-Cu-Mn Alloy Initial Aging Stage with Valence Electron Structure</b><br>L.S. Cao, J.X. Liu and C. Lin            | 328 |
| <b>Corrosion Protection and Composition of Galvanized Steel Substrates by Bis-[3-(triethoxysilyl)-Propyl]Tetrasulfide and Gamma-Aminopropyltriethoxysilane</b><br>F.J. Shan, G.C. Qi and C.S. LIU | 333 |
| <b>The Effect of Temperature and Pulling Rate on Young's Modulus of Steel FAS390Q</b><br>B.Y. Liu and J.Y. Yu   | 337 |
| <b><i>In Situ</i> Observation of Growth Process of <math>\delta</math> Phase of 0.15% C Carbon Steel during Solidification</b><br>X.D. Yue, G.C. Jin, S.Y. Chen and G.W. Chang                    | 341 |
| <b>Effect of Pulse Electric Field on the Columnar Crystals Growth of Al-5.6 Wt.%Cu during Unidirectional Solidification</b><br>G.W. Chang, S.Y. Chen, Q.C. Li, L.L. Guo and X.D. Yue              | 345 |
| <b>Research of Shrinkage Process for Fe-0.18%C Cast Ingot during Solidification</b><br>Q.C. Li, B. Wang, X.D. Yue, G.C. Jin and G.W. Chang  | 350 |
| <b>The Effect of Mixture Parameter on the Properties of SCC</b><br>H.Y. Liu and J.G. Qi   | 355 |
| <b>Microstructure Evolution of Cold Rolled Hot Dip Galvanized Dual-Phase Steel during Continuous Heating Process</b><br>G.C. Jin, X.D. Yue, M. Zhao, S.Y. Chen, Q.C. Li, G.W. Chang and A.M. Zhao | 359 |
| <b>Experimental Investigation of Formability Enhancement Using Hydraulic Counter Pressure Assisted Warm Deep Drawing</b><br>S. Kulkarni, S.N. Akhtar and J. Ramkumar                              | 364 |
| <b>Deformation Behaviour of AZ31 Magnesium Alloy Sheets Produced by Twin-Roll Casting and Sequential Hot Rolling</b><br>Y.D. Yu, P. Jiang, C. Li and K. Lin                                       | 368 |
| <b>Effects of Al Addition on the Microstructure of Fe-Mn-Si Ultra-Fine Grain Steel Welded Heat Affected Zone</b><br>J.G. Qi, D.J. Zhang, Z.F. Zhao, S. Dai and X.C. Liu                           | 372 |
| <b>Micronano Structure and Mechanics Behavior of Mosquito's Proboscis Biomaterials with Applications to Microneedle Design</b><br>X.Q. Kong and C.W. Wu   | 376 |
| <b>Semi-Solid Billets of AZ91D Magnesium Alloy Prepared by Forward Extrusion/Equal-Channel Angular Pressing</b><br>G.A. Zhang, C.Y. Ma and Q. Zhou  | 380 |
| <b><i>In Situ</i> Observation on Fracture Behavior of 800MPa Grade Dual-Phase Steel</b><br>G.C. Jin, S.Y. Chen, M. Zhao, Q.C. Li, X.D. Yue and G.W. Chang   | 385 |

|   |     |
|---|-----|
| <b>Effects of Different Melt Modification Techniques on the Structure and Properties of Silicon Brass</b>   |     |
| Z.F. Zhao, J.G. Qi, S. Dai, D.J. Zhang, H.M. Yang and J.Z. Wang   | 390 |
| <b>Molecular Dynamics Simulation Study of the Structural Evolution in the Cu-Ni Coalescence Induced by Ni Heterocluster</b>                           |     |
| G.J. Li, Q. Wang, Y.J. Zhang, Y.Z. Cao and J.C. He  | 395 |
| <b>Effects of Electric Pulse Modification on the Hot Tearing of Al-5%Cu-0.8%Mn Alloy</b>  |     |
| B. Wang, L.D. Tang, J.Z. Wang and J.G. Qi   | 399 |
| <b>Effect of Partitioning Temperature on Work Hardening Behavior of Q&amp;P Steels</b>  |     |
| S. Zhu, Y.L. Kang, K.K. Ren and S.C. Li   | 403 |
| <b>Influences of Melt Temperature on Casting Structure of Al-Cu-Mn Alloy Treated by Electric Pulse Modification</b>                                   |     |
| B. Wang, L.D. Tang, J.Z. Wang and J.G. Qi   | 408 |
| <b>Non-Symmetrical Load Influence on Aluminum Alloy-Welded Joint Fatigue Limit</b>  |     |
| H. Zou, Q. Li and S.G. Sun  | 412 |
| <b>Bulk and (001) Surface Properties of TiAl<sub>3</sub> Compound</b>   |     |
| L. Wang, J.H. Gong and J. Gao   | 417 |
| <b>Research on Stress-Strain Relationship Model of Concrete Prism Confined by GFRP</b>  |     |
| X.Y. Jiao   | 422 |
| <b>Corrosion Behavior of Zr<sub>53.5</sub>Cu<sub>26.5</sub>Ni<sub>5</sub>Al<sub>12</sub>Ag<sub>3</sub> Bulk Amorphous Alloy in 3.5% NaCl Solution</b> |     |
| Y. Li, S.Z. Shang, M. Cheng, L. Xu and S.H. Zhang   | 427 |
| <b>Effect of Temperature on Geometric Accuracy of AZ31 Profile during Warm Pre-Tension Rotation Bending</b>   |     |
| H. Xiao, S.H. Zhang and J.S. Liu  | 432 |

## II. Functional Materials

|  |     |
|--|-----|
| <b>Characterization of Ag Doped P-Type ZnO Thin Films Prepared by Electrostatic-Enhanced Ultrasonic Spray Pyrolysis</b>                  |     |
| J.H. Min, X.Y. Liang, B. Wang, Y. Zhao, Y. Guo and L.J. Wang   | 436 |
| <b>Methods of Improving Shape Memory Effect of FeMnSiCr Alloy Pipe Joint</b>   |     |
| X.J. Liu, J.Z. Wang and J.G. Qi  | 440 |
| <b>Heteroepitaxy of ZnO Films on Epi-GaN/Al<sub>2</sub>O<sub>3</sub>(0001) by MOCVD</b>  |     |
| Q.Q. Yu, J. Ma, C.N. Luan, L.Y. Kong and Z. Zhu  | 444 |
| <b>Magnesium Incorporation in Sol-Gel Derived Apatite Coating on Ti6Al4V Substrate</b>   |     |
| G.C. Qi, S. Zhang, Q. Li, F.J. Shan, J.Y. Yu, Q.D. Yang, Q.K. Zhang and C.M. Liu   | 448 |
| <b>Synthesis and NLO Properties of Calix[4]Arene Derivatives</b>   |     |
| M.F. Fang and G.Y. Lu  | 452 |
| <b>The Blue Luminescence of CeCl<sub>3</sub> Doped Aluminum Oxide Thin Film</b>  |     |
| G.J. Liao, H. Luo, S.F. Yan and M. Chen  | 456 |
| <b>Study on the Effects of the Self-Healing Microcapsules on the Tensile Properties of Polymer Composite</b>                             |     |
| L. Zhang, X.P. Dong and H. Chen  | 460 |
| <b>Oxidation Behavior of a New Ni-Base Superalloy in Air at 850°C and 950°C</b>  |     |
| J.B. Yang, K.Q. Qiu, X.D. Lu and Z.Q. Hu   | 466 |
| <b>Injection Molding Preparation and Film Formation Performance of Powders-Modified Polyethylene Biomass Carrier for Aerobic Process</b> |     |
| J. Hai, H.Y. Chen and J. Cheng   | 470 |
| <b>Sensitivity to NO<sub>2</sub> of ZnO Film Prepared by Electrostatic-Enhanced Ultrasonic Spray Pyrolysis</b>                           |     |
| J.H. Min, X.Y. Liang, B. Wang, Y. Zhao, Y. Guo and L.J. Wang   | 475 |
| <b>Study on Effect of Sintering Temperature on Microstructure and Compressive Property of Porous NiTi Alloys</b>                         |     |
| J.Y. Yu and Q. Li  | 480 |
| <b>Microwave Absorbing Properties of Fe<sub>x</sub>Co<sub>1-x</sub>(x=0.7, 0.8) Alloys with Spherical Nanoparticles</b>                  |     |
| F. Wang and L.Z. Zhang   | 484 |

|   |     |
|---|-----|
| <b>Study on Preparation of SiO<sub>2</sub> Optical Fiber Preform by SG Method</b><br>H. Tang, J.P. Zhang, F. Gu, F.C. Wang and J.H. Wang  | 489 |
| <b>Fabrication and Sinter-Ability of Ce<sup>3+</sup>-Doped YAG Ceramics by Low-Temperature Combustion Method</b><br>Z.Q. Wang, X. Sun and X.L. Zhou   | 493 |
| <b>First-Principles Study on Ga-N Co-Doped P-Type ZnO</b><br>H.S. Zhao, Y.D. Gu, N. Zhang and Y.H. Gao  | 498 |
| <b>Effect of BaO on Thermo-Physical Properties of Lithium Zinc Silicate Glass-Ceramics</b><br>B. Zhai, X.L. Zhou, S.R. Zhai and Z.Q. Wang   | 503 |
| <b><i>In Vitro</i> Behavior of Magnesium Apatite Coatings in Organic Modified Simulated Body Fluid</b><br>G.C. Qi, F.J. Shan, Q. Li, J.Y. Yu and Q.K. Zhang   | 508 |
| <b>The PTCR Performance of Nb-Doped BaTiO<sub>3</sub>-NBT Ceramics</b><br>L.Z. Li, X.W. Zhu, T.Z. Xu, M. Gong, W.Z. Jiang and X. Zhou   | 512 |
| <b>Synthesis and Lithium Storage Performance of Sn-Co/C Composite Anode Materials for Li-Ion Battery</b><br>S.B. Yang, D. Shen and X.G. Wu  | 516 |
| <b>The Magnetocaloric Properties of (Mn<sub>1-x</sub>Fe<sub>x</sub>)<sub>5</sub>Sn<sub>3</sub> Compounds Prepared in Magnetic Environment</b><br>J. Huang, J. Xiang, C. Zhi, X.Z. Wang and X.L. Hou | 520 |
| <b>The Magentocaloric Effect of Gd<sub>5</sub>Si<sub>2</sub>Ge<sub>2-x</sub>Zn<sub>x</sub> Alloy</b><br>X.L. Hou, J. Xiang, Z. Zeng, J. Huang, X.Z. Wang and H. Xu                                  | 525 |
| <b>Structural, Electrical and Optical Properties of Li-Doped ZnO Thin Films Influenced by Annealing Oxygen Pressure</b><br>L.D. Tang, B. Wang and J.Z. Wang   | 530 |
| <b>Study on Surface Oxidation Behavior of Poursous NiTi Alloy at High Temperature</b><br>Q. Li and X.N. Zhang   | 534 |
| <b>Broadband ~1.5μm Emission of Er<sup>3+</sup> in Heavy Metal Germanium Tellurite Glasses for Optical Fiber Amplifier</b><br>X. Liu, Q. Shen, H. Lin and D.L. Yang                                 | 538 |
| <b>Synthesis of Nano Amorphous In<sub>2</sub>O<sub>3</sub> by Microwave Method and its Photocatalysis</b><br>W. Si, J.Y. Yu and Q. Li   | 542 |
| <b>Up-Conversion Luminescence Properties of Gd<sub>2</sub>O<sub>2</sub>S:(Yb<sup>3+</sup>,Er<sup>3+</sup>) Nano-Particles Synthesized by a Co-Precipitation Method</b><br>X. Li and J.B. Lian       | 546 |
| <b>Synthesis and Growth Mechanism of NbSe<sub>2</sub> Nanostructures</b><br>Q. Wu   | 550 |
| <b>Morphology Control of Cobalt Oxalate Particles under the Action of Pulsed Electromagnetic Field</b><br>H.L. Du, Y.J. Zhou, J.G. Qi, J.Z. Wang and A.M. Liu                                       | 554 |
| <b>Study on Preparation and Optical Absorption of Ge Doped TiO<sub>2</sub> Composite Thin Films by Sol-Gel Method</b><br>Y.J. Zhou, F. He, J.G. Qi and Y.L. Wang                                    | 558 |
| <b>Influence of Electrical Pulse on Shape Memory Effects and Phase Transition of FeMnSiCrNi Shape Memory Alloy</b><br>X.J. Liu, Y. Gao and J.G. Qi  | 562 |
| <b>Study on the Influence of Different Pulse Temperatures on Al-22%Si Alloy Solidification Structure</b><br>Z.F. Zhao, J.Z. Wang, J.G. Qi, S. Dai and D.J. Zhang                                    | 566 |
| <b>Effects of Electric Pulse Treatment during Solidification on the Solidification Structure of Al-5%Cu Alloy</b><br>J.G. Qi, S. Dai, Z.F. Zhao, D.J. Zhang and J.Z. Wang                           | 572 |
| <b>Analysis of Structural Condition and Thermodynamics Condition of Graphite Heterogeneity Nucleation in Cast Iron</b><br>H. Qu and W.D. Liu  | 576 |
| <b>Preparation of Pd-TS-1 Composite Membrane for Hydrogen Separation</b><br>Y. Guo and H.M. Wu  | 580 |

|  |     |
|--|-----|
| <b>Study on the Activation Energy of Nanocrystallization of Amorphous Fe<sub>78</sub>Si<sub>9</sub>B<sub>13</sub> Alloy Treated by Low Frequency Pulse Magnetic Field</b><br>Y.C. Zhou and Q.J. Zhang      | 584 |
| <b>Fabrication and Characterization of Yttrium Lanthanum Oxide Transparent Ceramics Using Powders Prepared by Different Methods</b><br>Y.H. Li, Q.H. Yang and S.Z. Lu                                      | 588 |
| <b>Theoretical Calculation of <math>\beta</math> Transition Temperature of Ti-6Al-4V from Valence Electron Level</b><br>H. Qu and W.D. Liu   | 592 |
| <b>The Promotional Effect of Lanthanum Additive on the Apparent Electrocatalysis of Ti/(Ru,Ir)O<sub>x</sub> Electrode</b><br>P. Long, Q.F. Li, L.K. Xu, L.L. Xue and Y.L. Xin                              | 596 |
| <b>Hemocompatibility of TiO<sub>2</sub> Nanoparticles Composite PTFE Coating for Medical Devices</b><br>L.L. Xue, P. Long, H. Wei and Y. Liang   | 600 |
| <b>Effect of Synthesis Conditions on Photocatalytic Activities of Nanoparticulate TiO<sub>2</sub></b><br>Y.J. Zhou, H.L. Du, P. Qi and A.M. Liu  | 604 |
| <b>Influence of Processing Parameters on Atmospheric Pressure Plasma Etching of Polyvinyl Alcohol Films</b><br>S.J. Peng and Y.P. Qiu  | 608 |
| <b>Photoluminescence of (Gd<sub>1-x</sub>Dy<sub>x</sub>)<sub>2</sub>O<sub>2</sub>SO<sub>4</sub> Phosphors Synthesized by Homogeneous Precipitation Method</b><br>J.B. Lian, W.G. Wang, B.X. Wang and J. Li | 612 |
| <b>Study of Modified Properties on Electrolytic Phosphate Coatings with Nano-Al<sub>2</sub>O<sub>3</sub></b><br>J.J. Hao, C.R. Wang, X.Y. Liu, X.Q. Pu, C.Y. Dong, Y.Y. Cui and L.L. Zhang                 | 616 |
| <b>Preparation of Special Microstructures by Polystyrene-Block-Poly(methyl methacrylate) Surface Micelles</b><br>X.D. Hong and B. Liang  | 621 |
| <b>Fabrication and Luminescent Properties of Eu<sup>3+</sup>-Doped Yttrium Lanthanum Oxide Transparent Ceramics</b><br>Q.H. Yang, S.Z. Lu, Z.J. Bian, Y.H. Li, Z.F. Shi and Y.Z. Li                        | 625 |
| <b>The Effect of Sc<sub>2</sub>O<sub>3</sub> on Yb<sup>3+</sup>-Doped Y<sub>2</sub>O<sub>3</sub> Transparent Ceramics</b><br>S.Z. Lu, Q.H. Yang and Z.F. Shi   | 629 |
| <b>Spectral Properties of Pr<sup>3+</sup>:La<sub>2</sub>O<sub>3</sub> Ceramics</b><br>Z.F. Shi, Q.H. Yang, S.Z. Lu and H.J. Zhang  | 633 |
| <b>The Preparation and Characterization of LaAlO<sub>3</sub> Translucent Ceramics</b><br>Y.G. Wang, Q.H. Yang, D.D. Huang, S.Z. Lu, Z.F. Shi and Y.H. Li   | 637 |
| <b>Fabrication and Spectroscopic Properties of (Ho<sub>0.01</sub>La<sub>0.10</sub>Y<sub>0.89</sub>)<sub>2</sub>O<sub>3</sub> Transparent Ceramics</b><br>D.D. Huang, Q.H. Yang, Y.G. Wang and H.J. Zhang   | 641 |
| <b>Effect of Y Addition on Mechanical Properties of Ni<sub>50</sub>Mn<sub>28</sub>Ga<sub>22</sub> Magnetic Shape Memory Alloy</b><br>A.L. Liu, J.W. Xu, L. Gao and Y.F. Zheng                              | 645 |
| <b>Study on Polyethylene Glycol Acrylate Crosslinked Gels as Phase Change Materials</b><br>H. Zhang, Q.Q. Wang, H.X. Xiang and X.L. Wang   | 649 |
| <b>Study on the Preparation and Properties of PEG Phase Change Materials Fixed by Semi-IPN</b><br>H. Zhang, X.L. Wang and Q.Q. Wang  | 654 |
| <b>High Responsive ZnO Nanowire UV Sensor</b><br>L.X. Meng and L.Z. Zhang  | 659 |
| <b>A Preliminary Study of Anodization and Electroless Ni-P Plating on AZ80 Magnesium Alloy</b><br>P. Shi and X.D. Han  | 663 |
| <b>Automatic Setting Control of the Raw Slurry Blending Process Based on the Case-Based Reasoning</b><br>L.H. Yin, R. Bai and W.L. Guo   | 667 |
| <b>Study on Preparation of Gradient Porous NiTi Alloys by Powder Metallurgy Method</b><br>Q. Li, J.Y. Yu and G.C. Qi   | 671 |
| <b>Effect of Post-Annealing Ambient on Electrical Structural Properties and Optical Properties of ZnO:Al Transparent Films</b><br>L.D. Tang, B. Wang and J.Z. Wang   | 675 |

## **Part 2**

### **III. Composite Materials**

**Investigation on the Wettability between Nb-Al Alloy and Porous Al<sub>2</sub>O<sub>3</sub> Ceramics Prepared by Freeze Casting**

H.M. Chen, M. Luo, X. Li, X.X. Lin and D. Yang

687

**Effect of SnO<sub>2</sub> Coating on the Low Temperature Extrusion of 6061Al Matrix Composite Reinforced with Aluminum Borate Whisker**

P.T. Zhao, Z.M. Du, L.D. Wang and W.D. Fei

692

**Simulating Study on Microwave Assisted Switching of Ferromagnetic Moment for Grains**

S.M. Li

696

**Influence of Die Angle on the Extrusion Behavior of 6061Al Matrix Composite Reinforced with SnO<sub>2</sub>-Coated Aluminum Borate Whisker**

Z.M. Du, P.T. Zhao, L.D. Wang and W.D. Fei

700

**Effect of Voltage and Current Density on the Coating Performance of Micro Arc Oxidation on Pure Titanium Metal**

G. Jin, N. Zheng and C.S. Lou

704

**Preparation of Flexible Polymer-Cement Mortar**

S.A. Sun, Y.W. Fei, Y.P. Xiao, H.W. Yang and Z.M. Zong

708

**Research of SiC<sub>p</sub>/2A50 Composite Materials Creeper Treads Prepared by Liquid Forging**

Z.M. Du, J. Liu, Q. Cao, G. Chen, H.M. Jia and S.S. Xie

712

**Preliminary Approach to Mechanical Characteristics of Cement Mixed Superfine Iron Tailings**

B.K. Ning, J. Meng, Y.N. Ren, T. Jiang and X.L. Cui

718

**Preparation and Characterization of Core-Shell  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>/Au Composite**

W.C. Zhuang and Y.X. Wang

722

**Wearability of SiC<sub>p</sub> Particle Reinforced Aluminum Matrix Composites Creeper Tread**

Z.M. Du, J. Qin, J. Liu, G. Chen, H.M. Jia and S.S. Xie

727

**Complex Modification on Microstructure and Properties in Mg<sub>2</sub>Si Reinforced Hypereutectic Al-Si Composite**

Z. Liu and X.M. Liu

735

**Synthesis and Microwave-Absorbing Properties of Al<sub>2</sub>O<sub>3</sub> Coated Polyhedral Fe Nanocapsules Prepared by Arc-Discharge Method**

G.M. Shi, J.B. Zhang, D.W. Yu and L.S. Chen

739

**Experimental Study on Strength of Connections to Concrete Filled Tubular in Fire**

H.J. Sun and L.H. Zhao

743

**Comparative Study of Two Types of Alkali Lignin from Different Origin**

L.H. Zhao and H.J. Sun

747

**Study on Mechanical Properties of EPDM/HPVC Prepared by Dynamic Vulcanization**

B. Liang, J.M. Ji and X.D. Hong

751

**Dynamic Mechanical Thermal Analysis of Pultruded Carbon Fiber/Resin Composite Cable Cores**

Z.W. Zhou, R.C. Bai, M.S. Ren, L. Chen, A.J. Li, J.L. Sun, Q.P. Hu and C.B. Wang

755

**Effect of DLC Film on Tribological Properties of Carbon/Carbon Composites**

J.W. Ren, R.C. Bai, H. Li, A.J. Li, M.S. Ren and J.L. Sun

759

**Preparation of Magnetically Modified Zeolites and the Application of Metal Ions Adsorption**

M.L. Yuan, L. Yu, J.H. Tao and C. Song

764

**Research on Mixture Design and Mechanical Performance of Porous Asphalt Concrete in Cold Regions**

J.H. Xu, S.L. Chen, Y. Wang and G. Li

770

**Roll Casting of a Wire Inserted Strip**

T. Haga, K. Takahashi, S. Kumai and H. Watari

774



|   |     |
|---|-----|
| <b>Orientational Analysis on Static Recrystallization at Tension Twins in AZ31 Magnesium Alloy</b>  |     |
| X. Li, P. Yang and L. Meng  | 778 |
| <b>Effect of Solution Concentration on Growth and Photoluminescence of ZnO Nanorod Arrays</b>   |     |
| J.Z. Wang, L.D. Tang, L.L. Wang, B. Wang and H.L. Du  | 785 |
| <b>The Influencing of Fibers on the Concrete Used to Nuclear Waste Container</b>  |     |
| Y. Li, J.J. Zhou, J.Y. Han and C. Zhang   | 789 |
| <b>Study on the Friction Properties of Porous Al<sub>2</sub>O<sub>3</sub> Ceramic/ Al<sub>2</sub>O<sub>3</sub> Ultrafine Particle/ Epoxy New Composites</b> |     |
| J.Y. Yu   | 794 |
| <b>Mechanical Properties and Wear Behavior of Polypropylene/Carbon Nanotube Nanocomposites</b>  |     |
| Y.H. Liu and J.L. Gao   | 798 |
| <b>Thermal and Electrical Properties of Polypropylene/Carbon Nanotube Composites</b>  |     |
| J.L. Gao and Y.H. Liu   | 802 |
| <b>Study on Making Ceramic Composite Steel Plate by SHS Process</b>   |     |
| A.Y. Jiao, F.H. Wang and S.Q. Yang  | 806 |
| <b>Scanning and Modeling of Large Thin-Walled Curved Surface Part</b>   |     |
| C. Wang, X.M. Zhang and X. Wang   | 810 |
| <b>Manufacturing Process of Large Scale Sandwich Structure with Variable Thickness of PMI Foam Core</b>   |     |
| C. Wang, X.M. Zhang and C.Y. Tang   | 816 |
| <b>Manufacturing Brake Pads by Using Hot Powder Preform Forging for Low Duty Applications</b>   |     |
| A.A.S. Ghazi, K. Chandra and P.S. Misra   | 820 |
| <b>Effect of Milling Time on the Properties of Nanocrystalline CuCr50 Alloys</b>  |     |
| K.Y. Shi, T. Shen, L.H. Xue, C.H. Chen and Y.W. Yan   | 824 |

#### **IV. Advanced Manufacturing Process and Technology**

|   |     |
|---|-----|
| <b>Research on Intelligent Soft Starting Method for Three-Phase Asynchronous Motor Based on MATLAB</b>                        |     |
| Y.F. Zhu  | 828 |
| <b>Modeling and Simulation on Four-Way Valve Control Motor System of Cable Car Reel</b>                                       |     |
| J. Mao and G.W. Mo  | 832 |
| <b>Design of Monitoring Device for Goods Train Based on Zigbee Technology</b>   |     |
| C.B. Huo, C.L. Liu and C.J. Zhang   | 836 |
| <b>Research and Application of an Enhanced Data Mining Algorithm in Virtual Manufacturing Technology</b>                      |     |
| Y.J. Tong, J. Zhou, W.G. Xie and D. Jia   | 840 |
| <b>H<sup>∞</sup> Controller for Networked Nonlinear Manufacturing Process Interconnected Systems Based on T-S Fuzzy Model</b> |     |
| Y. Yu, W. Wang and S.C. Tong  | 844 |
| <b>Study on the Reliability Allocation Algorithm Based on Partial Squares Sum</b>   |     |
| Y.L. Jiang, A. Jiang, W.G. Xie, D. Jia, Y.J. Tong and W.S. Chen   | 851 |
| <b>Research on Iterative Learning Servo Controller of Permanent Magnet Linear Synchronous Motor</b>                           |     |
| Y. Cao, D.J. Luo and H.D. Li  | 856 |
| <b>Study on a Novel Single-Stage QR PFC Converter</b>   |     |
| X.Y. Hou  | 860 |
| <b>Engineering Application Research on PLC in the Oily Water Treatment Mechanical Device</b>                                  |     |
| Y.L. Dong, W.C. Cui and D. Hu   | 866 |
| <b>Study on Voltage Stability of Electricity Network Structure Based on the Eigenvalue Method</b>                             |     |
| B.C. Lu, Y. Liu, B.G. Li and J. Wang  | 870 |
| <b>Influences of Technology Parameters of Heavy Shell Ring Rolling Mill with Double Drive Rolls Based on FEM</b>              |     |
| J.L. Sun, Y. Peng, B. Ma, H.M. Liu, S.W. Chen, B.B. Sun and G. Liu  | 874 |

|  |     |
|--|-----|
| <b>CAE Optimization Design of Mine Hoist Spindle Device</b><br>Z.L. Yu and W.M. Li   | 878 |
| <b>Progress on Measurement of Adhesion Strength of Marine Microfouling Organisms</b><br>J. Zhou, C.G. Lin and D.X. Duan  | 883 |
| <b>Design Method for a Pair of Oval Bevel Gears</b><br>K. Shi, J.Q. Xia and C.J. Wang  | 887 |
| <b>Middle-Convex Curve and Ellipse Surface of Piston Skirt Design Based on MATLAB and Pro/E</b><br>Q. Gao, C.Y. Li, H. Zeng and L.B. Zhao  | 891 |
| <b>Simulation and Redesign of Industrial High-Speed Sewing Machine Based on Performance-Driven</b><br>J.H. Che, Q. Zeng, Z.Q. Sun and P.Z. Wang  | 895 |
| <b>Research on Manufacture Processes of Resin Dry Transformers Based on Object-Oriented Petri Net</b><br>J.F. Ni   | 899 |
| <b>Study on Geometrical Parameters Definition for Section Curve of Fully Intermeshing Twin Screw</b><br>W. Ding and X.Y. Wang  | 904 |
| <b>Weld Width Control System for Pulsed MIG Welding of Aluminum Alloy</b><br>L.H. Lu, D. Fan, J.K. Huang, M. Zhu and Y. Shi  | 908 |
| <b>Study on Stress Intensity Factors for Circumferential Cracked Elliptical Pipes under Tension</b><br>W. Wang, Y.M. Cai and Y.J. Xie  | 912 |
| <b>Fatigue Analysis of the Aircraft's Hydraulic Pipes Based on Fluid-Structure Interaction</b><br>H. Lv, Y.Y. Qiu and Y. Sheng   | 917 |
| <b>Finite Element Analysis of 35 Tons Steel Coil Overturning Machine</b><br>F.H. Wang and A. Jiao  | 921 |
| <b>The Virtual Design of Cluster Straw Fuel Briquetting Machine</b><br>F.H. Wang and Z.Y. Tian   | 925 |
| <b>Preliminary Research on Length Conversion Factor of Assemble Boom</b><br>G.Y. Lin, W.L. Li and F.L. Guo   | 929 |
| <b>Research for Tool Face Mathematical Model of Multi-Facet Drills Used in Processing High Manganese Steel</b><br>L. Xu, L. Yang and Z.H. Shi  | 936 |
| <b>Analysis and Simulation of Velocity and Acceleration Based on Three-Translational Parallel Mechanism</b><br>D.T. Xu, Z.L. Sun and Y.Y. Du   | 940 |
| <b>Research on Surface Morphology of Three-Dimensional in CNC Cylindrical Grinding</b><br>Z.G. Fan, Y.D. Gong and Y. Dong  | 945 |
| <b>Study on Fatigue Life Prediction of Mechanical Components with Stochastic Cyclic Load Application</b><br>Z. Wang, A.N. Wang, K. Guo and J.H. Cheng                                  | 949 |
| <b>The Numerical Simulation and Optimization of Squeeze Casting Process for Producing Magnesium Wheels</b><br>R.Q. Yao and H.Q. Tang   | 955 |
| <b>Experiment Research on Impact of Total Rolling Reduction Ratio on the Properties of Vacuum Rolling-Bonding Ultra-Thick Steel Plate</b><br>G.L. Wang, Z.A. Luo, G.M. Xie and K. Zhao | 962 |
| <b>Influence of Welding Residual Stress on Stress Intensity Factor of Two-Dimensional Cracks</b><br>J.S. Yang and W. Jiang   | 966 |
| <b>Numerical Simulation of Performance of Steam Ejector Influenced by the Distance between Nozzle Outlet and Mixing Chamber Inlet</b><br>X.C. Dai and G.J. Liao                        | 970 |
| <b>An Approach for Application of Drive at Center of Gravity in a Vertical Machining Center</b><br>X.Y. Guan, W. Zhang and Z.X. Xu   | 974 |
| <b>Vibration Simulation of Disc Vibration Dryer Based on ADAMS</b><br>X.P. Wang and Z.W. Zhang   | 978 |

|   |      |
|---|------|
| <b>Study on Forming Feasibility of AISI-5140 Triple Valve by Multi-Way Loading: From Aspect of Geometric Parameters</b><br>Z.C. Sun, J.H. Wang and H. Yang                              | 982  |
| <b>Curvature Characters of Revolving Curved Surface and Applications in Math Model of Milling Cutter</b><br>W. Ding and X.Y. Wang   | 988  |
| <b>Research on Mold's Reverse Modeling and Basic Surface Repair</b><br>D.Q. Zhang, L.Y. Su, J. Cheng and Y.Q. Su  | 992  |
| <b>Optical Path Design and Gain Anticipation in Tm<sup>3+</sup> Doped Glass Channel Waveguide for U-Band Amplification</b><br>M. Tian, Z.Y. Zhou, W. Guo, H. Lin and X. Zhao            | 997  |
| <b>Finite Element Analysis of Spindle for Turning Center Based on ANSYS</b><br>J.H. Li, Y.X. Liu, Y. Yu and J.L. Han  | 1001 |
| <b>The Deformation Rule of the Cooled U75V Heavy Rail Caused by the Different Heat Transfer Coefficient</b><br>M.X. Gao, P.L. Wang, H. Jia, S.H. Tong, H. Song, S.Y. Yuan and Z.Q. Wang | 1005 |
| <b>3D Numerical Simulation of Point Impact Breakage of a Glass Ball</b><br>Y.C. Yang and X. Wang  | 1012 |
| <b>Surface Quality of Pulsed Laser Cutting of Difficult to Machine Steel</b><br>T.J. Li, J. Tang, L.J. Yan and Y. Wang  | 1016 |
| <b>Carbon Nanotube Templated Growth of Nano-Crystallinity ZSM-5</b><br>K. Tang and X. Hong  | 1020 |
| <b>Mechanical Design of Bionic Snake Mouth and its Analysis</b><br>Z.J. Liu, J. Fei, Z. Fu, W.X. Yan and Y.Z. Zhao  | 1024 |
| <b>The Optimum Design of A2JK Hoist Drum Based on ANSYS</b><br>S. Chen  | 1028 |
| <b>Research on Cutting Force of Milling Aviation Aluminum Alloy</b><br>J.H. Liu, Y.Y. Guo and G.B. Bu   | 1032 |
| <b>Investigation of Water Cavitation Peening-Induced Microstructures and Residual Stress in the Near-Surface Spring Steel SAE 1070</b><br>B. Han, H. Zhang and D.Y. Ju                  | 1036 |
| <b>Study on Web-Based Collaborative Design of Air-Hydraulic Intensifier</b><br>H.J. Xie and H.W. Guo  | 1040 |
| <b>Research on Breaking Chip and Drilling Force for High Temperature Alloy Based on Self-Vibratory Drilling Head</b><br>X.J. Gao, P. Zou, D.J. Li and Z.Y. Xiang                        | 1044 |
| <b>Research on Bending Process of Integral Panel Skins</b><br>J.S. Liu, Y. Guo, S.H. Zhang and H. Xiao  | 1048 |
| <b>Machining of Metal Matrix Composites with Minimum Quantity Cutting Fluid and Flood Cooling</b><br>M.R. Sankar, J. Ramkumar and S. Aravindan  | 1052 |
| <b>Discussion on Binding Additives and Binding Process in Selective Laser Sintering</b><br>W.J. Xie, W.L. Zhao, J. Zhang and J.H. Liu   | 1056 |
| <b>Surface Quality Analysis in Mill-Grinding of SiCp/Al</b><br>Y.X. Yao, J.G. Du, J.G. Li and H. Zhao   | 1060 |
| <b>Structure Analysis of Hybrid Self-Reconfigurable Modular Robot</b><br>Y.Q. Fei, W. Yang and J. Yu  | 1064 |
| <b>Nano-Particle Manipulated with Near-Field Optical Tweezers</b><br>J. Tang, L.J. Yang, B.H. Liu and Y. Wang   | 1068 |
| <b>Simulation Analysis of an Eddy Current Sensor Array Based on Finite Element Method</b><br>J.Q. Du, Y.T. He, H. Ding, H.W. Zhang and L.M. Wu  | 1072 |
| <b>The Effects of Hollow Ratio on the Radial Bearing Properties of Pre-Loaded Cylindrical Roller Bearings</b><br>Y.G. Wei, Y.K. Liu and X.J. Zhang                                      | 1078 |
| <b>The Modal Analysis for Spiral Bevel Gear Based on Patran/Nastran</b><br>H. Zeng, Q. Gao, W.G. Zhang and Y. Li  | 1083 |
| <b>Application of Yolico YD5200 Frequency Converter in Mine Hoist</b><br>G.J. Chen and C.X. Wang  | 1087 |

|   |      |
|---|------|
| <b>3D Model Registration Based on Feature Extraction</b><br>J. Zhu, Y. Takekuma, T. Tanaka and Y. Saito   | 1091 |
| <b>Study of Friction Stir Welding Technics and Weld Performance of Dissimilar 6063-3A21 Aluminum Alloys</b><br>L. Wang, J.J. Zhu, W. Zhang, X.M. Feng and Z.Y. Feng | 1095 |
| <b>Research of a Piezoelectric Driving Linear Movement Device</b><br>H.X. Wang, J. Hu, Y.Y. Ma and Q. He  | 1099 |
| <b>Effect of Bending Direction on Springback of High Strength Steel Sheet</b><br>V. Premanond, P. Kaewtatip, N. Moolsradoo, A. Khantachawana and K. Lawanwong       | 1103 |
| <b>Effect of Tempering Holding Time on Performance of Wear-Resistant Steel of High Pressure Blower Impeller</b><br>D.L. Yi and G.L. Yin                             | 1107 |
| <b>Underground Tunnel Development Survey of Shield Tunnelling Machine</b><br>X.S. Chang   | 1111 |
| <b>The Optimization Design of Cheese Bionic Kneader with Response Surface Method(RSM)</b><br>B.Z. Wu  | 1115 |
| <b>Distributed and Cooperative Organization of Information Platform for Manufacturing Clusters</b><br>H.Y. Wang and X. Chen   | 1120 |
| <b>The Study on CAD Technology of Reconfigurable and Module for Vertical Bag Packaging Machine</b><br>R. Shang and S.Y. Li  | 1124 |
| <b>Preparation of Bio Tissue Micro Array Based on NC Positioning and Image Processing Technology</b><br>Y.C. Zhang  | 1128 |
| <b>Research on a New Type of Ultrasonic Polishing Vibrator</b><br>Q. He, Y.H. Li, K. Jia and L. Li  | 1132 |
| <b>Residual Stress Measurement for Coated Film on Cold Work Tool Steel</b><br>B. Sresomroeng, P. Chumrum and V. Premanond   | 1136 |
| <b>Influence Analysis of Machining Errors on Bearing Capability of Internal Gear Pair</b><br>K. Huang and Y.D. Zhang  | 1142 |
| <b>Effect of Shoulder Diameter on the Resulting Interfacial Regions of Friction Stir Welds between Aluminium and Copper</b><br>E.T. Akinlabi and S. Akinlabi        | 1146 |
| <b>Effect of Scan Velocity on Resulting Curvatures during Laser Beam Bending of AISI 1008 Steel Plates</b><br>S. Akinlabi, T. Marwala, E.T. Akinlabi and M. Shukla  | 1151 |
| <b>Design of Hydrostatic Pressure Tests Automatic Control System on Oil Pipeline (bolster) by PLC and IPC</b><br>J. Wu and G.J. Chen                                | 1157 |
| <b>FEA of Solid Stream Coupling Field Formed by Automobile Engine Cylinder Head and Cylinder Head Gasket</b><br>W.M. Li   | 1161 |
| <b>A Regression Model for Force and Surface Roughness Estimation during Hard Turning</b><br>G. Bartarya and S.K. Choudhury  | 1167 |
| <b>Study on Identification Method of Geometric Parameter Errors of 6-DOF Parallel Machine Tool</b><br>P. Shan, L.Y. Xie, J.L. Shi and M.F. Sun                      | 1171 |
| <b>Research on Seamless INS/GPS Integrated Navigation Algorithm</b><br>T.L. Xu and Y. Tian  | 1178 |
| <b>Monitoring System Design of Fuse Automatic Assembly Machine Based on WinCC</b><br>Z.G. Jiao, H. Cui and Q.P. Guo   | 1182 |
| <b>Vehicle Engineering Application Study on TSF Var Compensation Method for Electric Locomotive of Electrified Railway</b><br>L. Wei, J.S. Xiao and Y.L. Dong       | 1186 |
| <b>Study on the Speed Control of Diesel Engine Based on Neural Sliding Mode Control</b><br>J. Zhang, H.H. Lan and Y. Sun  | 1190 |

## **V. Vehicle Engineering Technology**

|  |      |
|--|------|
| <b>Design of Measurement and Control System for the Rail Fastening Spring Clip Type A and B</b>                              |      |
| Y.P. Yao, Y. Shi and Y.P. Song   | 1194 |
| <b>Experimental Determination of Aircraft Structural Material Life Envelope</b>  |      |
| H.W. Zhang, Y.T. He, L.M. Wu, Q. Shao and J.Q. Du  | 1198 |
| <b>Study on Expression of SIF for Tapered Lug Subjected to Oblique Pin-Load</b>  |      |
| L.M. Wu, Y.T. He, H.W. Zhang, R.H. Cui and J.Q. Du   | 1203 |
| <b>Study on Locally Resonant Phononic Crystals Based on Automotive Noise Control</b>   |      |
| Y.Y. He, X.X. Jin and H. Wei   | 1208 |
| <b>Simulation Analysis and Research of Tire Wear</b>   |      |
| J.F. He, X.X. Jin and C.Y. Hou   | 1212 |
| <b>Research and Application of Genetic Algorithm in Material Handling Route for Assembly Line of Airbag</b>                  |      |
| J.Y. Wan, X. Jiang and Y.P. Wang   | 1217 |
| <b>A New Analytical Method for Influences of Shock Absorber Rubber Mount on Automotive Ride Comfort</b>                      |      |
| L.J. Zhang, H.L. Liu and Y.Z. Li   | 1221 |
| <b>Crashworthiness Design of Vehicle Body Based on Factorial Screening</b>   |      |
| S.J. Hou, D. Dong and L.L. Ren   | 1227 |
| <b>Modeling and Simulation with Finite Element Method in Car Seats</b>   |      |
| J.L. Wang, Y.G. Li and S.F. Wang   | 1231 |
| <b>Optimization Design of Double Wishbone Front Independent Suspension Based on ADAMS</b>                                    |      |
| Z.H. Tian, S.F. Wang and Y.G. Li   | 1235 |
| <b>Aerosol Behavior in the near Wake Region of the Vehicle</b>   |      |
| Z. He, Q.Z. Shen, B.K. Li and T.L. Chan  | 1239 |
| <b>Random Vibration Analysis of Heavy-Duty Truck Based on Pseudo Excitation</b>  |      |
| Y.Y. Qin, J.Q. Wang and G.H. Tian  | 1244 |
| <b>Surface Reconstruction of Auto Outer Door Panel Based on Reverse Engineering</b>  |      |
| G.H. Tian, X.C. Wu, X.S. Su and K. Li  | 1248 |
| <b>AHP Approach for Supplier Selection in a Polyamide Fiber Plant in Supply Chain Management</b>                             |      |
| H. Jin, C.L. Liu and X.Y. Wang   | 1252 |
| <b>Simulation for Vehicle Handling Performance Based on the Cybernetic Model of “Driver-Vehicle-Road” Closed-Loop System</b> |      |
| H. He, K. Zhang and P. Wang  | 1256 |
| <b>The Motive Reliability Design of Mechanical Structure</b>   |      |
| R.X. Bao, Y.K. Li, J. Li and X.G. Wang   | 1262 |
| <b>Stability Optimal Control Based on 15-Dof Vehicle Model</b>   |      |
| X.B. Fan, Y. Jiang and H.G. Wang   | 1266 |
| <b>Research on Congestion Mitigation Strategy Downstream Off-Ramp for Urban Expressway Based on Fuzzy Logic Method</b>       |      |
| X.W. Chen  | 1271 |
| <b>Study on Bike Rental Pricing Model under the Low-Carbon Mode</b>  |      |
| X. Chen, Y.Y. Zhang and J.X. Yu  | 1275 |
| <b>Study on the Relationship of Airbag Effect and Occupant Position</b>  |      |
| X.C. Wu, K. Li, B. Wang and X.S. Su  | 1279 |
| <b>Using the Law of “Three Points and Two Sections” to Reduce the Risk of Vehicle Collisions</b>                             |      |
| Y.S. Tang, L.Y. Wang and C. Yang   | 1283 |
| <b>Natural Frequency Study of Automotive Engine Valve Spring by Experimental Method</b>                                      |      |
| H. Liu and H. He   | 1287 |
| <b>Coordination between Road Network and Economic Development Based on WPDEA</b>   |      |
| X.L. Lu and D.C. Wang  | 1291 |
| <b>Design and Controlling Study on Electro-Hydraulic Mix-Drive Cooling System in Vehicle</b>                                 |      |
| M. Duan, Y. Liu and D. Wang  | 1295 |

|  |      |
|--|------|
| <b>Research and Implementation of Batteries Charging Management System for Electric Vehicle</b><br>J. Shi and L. Shi   | 1299 |
| <b>Jackknife Control on Tractor Semi-Trailer during Emergency Braking</b><br>S.W. Zhou, S.Q. Zhang and G.Y. Zhao   | 1303 |
| <b>Engine Fault Diagnosis Based on PSO-BP Network</b><br>L.X. Nie, T.X. Zhang, S.J. Wang and L.P. Zhang  | 1307 |
| <b>Research on Outlier Mining Algorithm Oriented to Traffic Information</b><br>W.G. Xie, H.H. Wang, X.C. Gu and Y.F. Guo   | 1312 |
| <b>Study on Assessment Method and Statistical Distribution of Cylinder Error</b><br>L. Ji, H.L. Huang and X.F. Mei   | 1316 |
| <b>Component of Cu/n-SiO<sub>2</sub> Composite Particles by Mechanical Milling</b><br>J.H. Du, X.H. Zheng and X.Y. Zhu   | 1320 |
| <b>Research on Synchronous Testing Technique of the Shock Absorber Performance in Automotive Coaxial Suspension</b><br>T.L. Wang, X.B. Sun and Y. Yu               | 1324 |
| <b>Elemental Identification of Materials Using Optical Emission Spectra during Electric Discharge Machining</b><br>S. Kanmani Subbu, J. Ramkumar and S. Dhamodaran | 1330 |
| <b>Single Discharge of Dry <math>\mu</math>-EDM on Silicon: Crater and Plasma Temperature Measurement</b><br>S. Kanmani Subbu, J. Ramkumar and S. Dhamodaran       | 1334 |