

# Materials Design, Processing and Applications

Selected, peer reviewed papers from the 4th International Conference on Manufacturing Science and Engineering (ICMSE2013), 30-31 March, 2013, Dalian, China

von

Xianghua Liu, Kaifeng Zhang, Mingzhe Li

1. Auflage

[Materials Design, Processing and Applications – Liu / Zhang / Li](#)

schnell und portofrei erhältlich bei [beck-shop.de](http://beck-shop.de) DIE FACHBUCHHANDLUNG

Thematische Gliederung:

[Werkstoffkunde, Mechanische Technologie](#)

Trans Tech Publications 2013

Verlag C.H. Beck im Internet:

[www.beck.de](http://www.beck.de)

ISBN 978 3 03785 692 5

# Table of Contents

## Preface and Conference Organization

## Chapter 1: Non-Ferrous Metal Materials and its Alloys

|  |    |
|--|----|
| <b>Effects of Annealing on Microstructure and Phase Transformation Temperature of NiTiNb Shape Memory Alloy after Equal Channel Angular Pressing</b><br>Y.Z. Huang, S.Q. Lu, J.W. Liu, K.L. Wang, G.F. Li and X.Y. Shu | 3  |
| <b>Research on Dynamic Recrystallization Behavior of near-<math>\alpha</math> Titanium Alloy during near-<math>\beta</math> Compression</b><br>B. Zhou and S.Z. Zhang  | 8  |
| <b>Structure and Physical Properties of Liquid Ni<sub>2</sub>Sb<sub>98</sub> Eutectic Alloy</b><br>T. Lv, H.L. Zheng, F.X. Guo and X.L. Tian   | 12 |
| <b>The Microstructure Evolution and Twinning Characterization of AZ31 Mg Alloy Sheet in Low-Temperature Bending Process</b><br>J.W. Liu, S.Q. Lu, K.L. Wang, G.F. Li and X. Xiao                                       | 16 |
| <b>An Experimental Study of High-Velocity Impact on Aluminum Foam Composite Shield Structure</b><br>Q.Z. Li, Z.H. Du and K.K. Wang   | 20 |
| <b>Extraction of Tantalum from Ta<sub>2</sub>O<sub>5</sub> Using SOM Process</b><br>C.Y. Chen, Y.L. Lv and J.Q. Li   | 25 |
| <b>Reaction Mechanism on Preperation of Ta with SOM Process</b><br>C.Y. Chen, Y.L. Lv and J.Q. Li  | 30 |
| <b>Sintering Characters Analysis of the Al<sub>2</sub>O<sub>3</sub>-86 Homogenized Bauxite</b><br>H.Y. Yang, Y. Li, S.L. Liu, C.H. Gao, S.L. Ma and L.J. Wang  | 35 |
| <b>Step Reactive Sintering of Ti<sub>2</sub>AlNb Based Alloy with Element Powders</b><br>Y.X. Wang, K.F. Zhang and L. Zhen   | 40 |
| <b>Study on Microstructures and Mechanical Properties of Die Casting Mg-xGd-3Y-0.5Zr Alloys</b><br>F. Wang, Z. Wang, Z. Liu and P.L. Mao   | 44 |
| <b>Study on Sintering Properties of Al<sub>2</sub>O<sub>3</sub>-70 Natural Mullite by New Processes</b><br>S.L. Liu, Y. Li, H.Y. Yang, C.H. Gao, S.L. Ma and L.J. Wang   | 49 |
| <b>Study on the ZK60A and AZ31B Magnesium-Alloy in the Application on High-Speed Train Seats</b><br>L. Song, Y.H. Zhao, J.Z. Liu, J.H. Mu and X.C. Guo   | 53 |
| <b>The Effect of Heat Treatment on Microstructure and Performance of Die Forging Copper</b><br>G.R. Yang, W.M. Song, Y. Ma and Y. Hao  | 58 |
| <b>Yield of Alloying Elements Fed by Cored Wire into A Copper Melt</b><br>B.H. Kang, W.H. Lee, J.Y. Cho, M.J. Lee and K.Y. Kim   | 62 |
| <b>Effect of Cooling Mode on Properties of a Cast Zinc Alloy</b><br>F. Zhang and J.G. Wan  | 66 |
| <b>Effects of Cr Substitution of Mo on the Formation and Mechanical Properties of FeCoMoCrZr Amorphous Alloys</b><br>C.X. Xie, Y.Z. Yang and M.Z. Chen   | 70 |
| <b>Study of Thermal Stability of Magnesium Alloys</b><br>Z. Turnova, T. Chrebet, I. Turekova and K. Balog  | 74 |
| <b>Direct Electrolytic Reduction of Solid Cr<sub>2</sub>O<sub>3</sub> to Cr Using SOM Process</b><br>C.Y. Chen, Z.H. Mao and J.Q. Li   | 78 |
| <b>Electrochemical Behaviors of Die-Cast Mg-4Al-0.4Mn-Xpr (x=0, 1, 4) Alloys in NaCl Solution</b><br>X.D. Niu, W. Sun, X. Qiu, J. Meng and J. An   | 82 |

## Chapter 2: Iron, Steel and its Alloys

|  |     |
|--|-----|
| <b>Alloy Design and Application for Avoiding Carbide Network of CrWMn Steel by Phase Equilibrium Thermodynamic Method</b><br>Y.Q. Ma, X.J. Zhang and Y.F. Liang  | 91  |
| <b>Atmospheric Corrosion Behavior of Salvaged Marine Cast Iron Artifacts</b><br>W.Z. Ouyang  | 97  |
| <b>Characterization of Passive Film Formed on X80 Pipeline Steel in Sodium Bicarbonate Solution</b><br>P. Liang, Y.H. Shi, Y.X. Zhang and C.S. Hu  | 101 |
| <b>Development of Hot Rolled Ship Plate with High Strength and High Toughness</b><br>X.D. Huo, L. Guo, J.S. Feng, C. Luo and J. Qu   | 106 |
| <b>Effect of Rare Earth on Microstructure and Mechanical Property of Ferrite Stainless Steel</b><br>X. Liu and H.W. Dong   | 110 |
| <b>Effect of Slag Composition on Total Oxygen of High Speed Wheel Steel</b><br>Y. Tang   | 114 |
| <b>Failure Analysis on Fracture of 16Mn Steel</b><br>H.W. Wang, W.T. Li, H. Bai, H.Q. Xiao and H.M. Yu   | 118 |
| <b>Green Manufacturing Operation Mode for Iron &amp; Steel Enterprise</b><br>Z.P. He, H. Zhang, Y.H. Wang and Z.G. Jiang   | 122 |
| <b>Improvement of Radiation- and Thermal Stress-Induced Springback Degradations in Invar Alloy Using Repeated Radiation Plus Hot-Then-Cold Treatments</b><br>C.F. Yang, W.W. Wang, E. Pan, S.S. Lin and J.J. Lin | 128 |
| <b>Intergranular Corrosion Behavior of 00Cr12 Ferritic Stainless Steels Containing Cerium</b><br>Y.B. Li, F.M. Wang and X.N. Cheng   | 133 |
| <b>Microstructure Evolution and Grain Boundary Characteristics of Oriented Silicon Steel during Primary Recrystallization in a Pulsed Magnetic Field</b><br>L.H. Liu, L.J. Li and Q.J. Zhai                      | 139 |
| <b>Microstructure Refinement of Hypereutectic High Chromium Cast Iron with Electric Current Pulse</b><br>H. Chen, L. Zhang and S.M. Wang   | 147 |
| <b>Recrystallization Thermal Simulation Experiment for a Micro-Alloy Steel</b><br>F. Liu   | 153 |
| <b>Research on a New Secondary Creep Model and Creep Damage Evolution for P92 Steel</b><br>J. Yuan, H. Xu and Y.Z. Ni  | 157 |
| <b>Research on Fatigue Behavior of Beam with Corrugated Steel Webs</b><br>X.L. Hu, L.F. Tan and Q.X. Wang  | 164 |
| <b>Research on Molten Steel Flow with Electromagnetic Stirring</b><br>J. Zhang   | 168 |
| <b>Research on Powder Metallurgy High Nitrogen Stainless Steels</b><br>D.W. Cui and J.L. Wang  | 172 |
| <b>The Effect of Finish Rolling Temperature on Microstructure and Mechanical Properties of Vanadium Containing Ferritic Stainless Steel</b><br>S.Y. Chen, J. Xu, X. Zhang and Y.T. Yang                          | 176 |
| <b>The Effect of Microstructure on Properties of High Deformation Pipeline Steel X70</b><br>X.L. Wan, K.M. Wu and Z.H. Xia   | 182 |
| <b>The Investigation in the Influence of Hardness to Transition Point after Tempering for Boric Carbon Steels</b><br>H.H. Chung and T.H. Chen  | 186 |
| <b>Thermodynamic Analysis and Observation of Inclusions in H13 Die Steel with Rare Earth</b><br>X. Liu and J.L. Liang  | 193 |
| <b>20#,60Si2Mn,9Cr18MoV Steel Ferrite Area Dynamic Recovery and Recrystallization Research</b><br>L. Li, W.K. Xiao, T.T. Fan and Z.Q. Zhang  | 197 |
| <b>Beneficiation Study on an Oolitic Hematite</b><br>J. Sun and J.Z. Zhang   | 202 |
| <b>Corrosion Property of A New Repair-Free Steel Developed for Bottom Plate of Cargo Oil Tanks</b><br>F.L. Sun, X.Q. Cheng and X.G. Li   | 206 |

|   |     |
|---|-----|
| <b>Effect of Loading Rate on Tensile Properties of Automotive Steel Sheet</b><br>J.G. Qin, F.Y. Lu, Y.L. Lin and X.J. Wen   | 211 |
| <b>Effect of Secondary Cooling on Non-Oriented Electrical Steel Strips Produced by Twin-Roll Casting Process</b><br>T. Zhang, X.M. Zhang, Z.Y. Guo, Y.Q. Wang and C.G. Li   | 218 |
| <b>Effect of Tempering Process on Residual Stress in Hot Rolled Low Carbon Martensite High-Strength Steel Strip</b><br>L. Sun, Z.Y. Zhao, X.Z. Yang and R.D. Xue  | 222 |
| <b>Hot Ductility Behavior of 800MPa Ultra High Strength Niobium Containing Steels</b><br>Q.S. Li, M. Zhang, C.B. Huang, R.Y. Wu, X. Zhao, Y. Zhong and L. Li  | 227 |
| <b>Numerical Simulation on Collision and Aggregation Process of Al<sub>2</sub>O<sub>3</sub> Inclusions with Different Morphology Characteristics</b><br>Y. Wang, H. Li and L.F. Guo                                 | 233 |
| <b>Research on Using Limestone for Slagging during BOF Steelmaking Process</b><br>J. Feng, H. Li, C.X. Li, W.C. Song, W. Nian and L.F. Guo  | 237 |
| <b>Study on Desulfurization Kinetics Model of LF Refining</b><br>Y. Yue, B. Zhang and Z.L. Xue  | 246 |
| <b>Study on Initial Oxidation Film Formation Mechanism of T23 Steel at 600°C</b><br>W. Wang, Z.W. Wang, W.L. Zhong, T. Song and W. Wei  | 252 |
| <b>The Implementation of Steelmaking MES for Pangang Group</b><br>J.B. Wu and J.G. Liu  | 256 |
| <b>The Investigation on Wire Rod Materials of Low Carbon Steels and Extra Low Carbon Steels</b><br>H.H. Chung and T.H. Chen   | 262 |
| <b>Influence of Heat Treatment on Microstructure and Properties of Ultrahigh Strength Fe-Ni-Co Alloy</b><br>J.Y. Zhong and P. Zhong   | 270 |
| <b>Corrosion-Resistant Alloys for Tubings and Casings and Alloy Material Selection in Oil and Gas Wells</b><br>L.F. Li  | 276 |
| <b>Effect of Water Vapor on Oxidation of Ferritic Stainless Steel 21Cr-0.6Mo-Nb-Ti in Simulated Reheating Environment</b><br>X.W. Cheng, Z.Y. Jiang, D.B. Wei, L. Hao, J.W. Zhao, J.G. Peng, S.Z. Lu and L.Z. Jiang | 280 |
| <b>Study of the Effect of W and Mo Binary Alloying on Fe-Ni36 Invar Alloy Properties</b><br>C. Wang, S.Q. Yuan, C.G. Yao and Z.P. Feng  | 290 |
| <b>Effect of Pre-Oxidation on the High Temperature Oxidation Behavior of Fe-Cr-Al Powder Porous Metal</b><br>J.S. Oh, S.H. Lim, S.H. Choi, M.H. Park and K.A. Lee   | 294 |
| <b>Experimental Research on Size Effect of Magnetic Hysteresis Loop for Q235 Steel</b><br>A.G. Li, J.H. Zhao and E.G. Xiong   | 298 |

### Chapter 3: Composites

|  |     |
|--|-----|
| <b>Analysis and Research on the Microstructure Fractal Characteristics of the Copper Matrix Composites</b><br>R.B. Ma, S.M. Xu and J.H. Du   | 305 |
| <b>Dynamic Analysis of the Rotating Composite Thin-Walled Cantilever Beams with Shear Deformation</b><br>Y.S. Ren and Q.Y. Dai   | 309 |
| <b>Finite Element Model and Bending for Marine Composite Flexible Pipes</b><br>M. Wang, R.X. Bai and M.J. Zhou   | 314 |
| <b>High-Temperature Dry Sliding Friction and Wear Characteristics of As-Cast SiC<sub>p</sub>/A356 Composite</b><br>Y.X. Jin, X.Y. Wang, Q.Q. Tong, H.M. Chen and J.M. Lee              | 318 |
| <b>Influence of Fiber's Surface State on Mechanical Properties and Fiber-Matrix Interaction of CFRP</b><br>J.J. Sha, Y.X. Zhang, J. Li, J.X. Dai, Z.Q. Wei, J. Hausherr and W. Krenkel | 323 |

|  |     |
|--|-----|
| <b>Microstructure and Properties of Deformation-Processed Cu–Cr <i>In Situ</i> Composites</b><br>K.M. Liu, Z.B. Chen, J. Zou, S.Y. Wei, Q. Hu and D.P. Lu  | 329 |
| <b>Preparation of the High Temperature Resisting Material with Al-CrO<sub>3</sub> System by SHS</b><br>Y. Wang   | 334 |
| <b>Study on High-Speed Milling Force of SiC<sub>p</sub>/Al Matrix Composite</b><br>L. Xin and J.J. Lv  | 338 |
| <b>Synthesis and Characterization of MgFe<sub>2</sub>O<sub>4</sub> /MgO Composite Films from Layered Double Hydroxides Precursors</b><br>Y.C. Zhang, T.T. Chen and L. Yang                                       | 342 |
| <b>Synthesis Method and its Influence Factors of Hydrotalcite-Like Compounds</b><br>H.D. Xue, F.L. Wang, G.L. Li, P. Liu, Y.Q. Bai and K. Wang   | 351 |
| <b>The Influence of AC Perturbations on EIS Measurement of Copper/LDPE Composite with High Resistance</b><br>Y. Wang and X.X. Hu   | 355 |
| <b>The Sorting Method of the same Pattern Compound Material Based on Basic Element Model of Surface Microstructure</b><br>S.M. Xu, R.B. Ma, J.H. Du, J.H. Liu and Q. Jin   | 359 |
| <b>Vulcanization Kinetics of Starch Xanthate /Natural Rubber Composite</b><br>W.J. Luo, S.D. Li, Z.F. Wang, L. Fang, H. Lin and T.J. Zhao  | 363 |
| <b>Application of Diffraction and X-Ray Microanalysis in Study of MMC Structure</b><br>K. Gawdzińska   | 368 |
| <b>Influence of Temperature on Carbonation Pellet for Ferrous Dust</b><br>Y. Shi, X.J. Li and C.Q. Hu  | 374 |
| <b>Innovative Utilization of a Borate Additive in Magnesium Production to Decrease Environmental Impact of Fluorides from Pidgeon Process</b><br>F.L. Han, Q.X. Yang, L.E. Wu and C. Du                          | 378 |
| <b>Microstructure and Formation Mechanism of Two-Liquid Bimetal Composite Interface</b><br>Y.C. Zhu, S.F. Rong, H.S. Yang, Z.J. Wei and M.M. Han   | 390 |
| <b>Morphology and Property of Polypropylene Composites Filled with Modified Attapulgite</b><br>L.S. Hu and S.P. Liu  | 394 |
| <b>Parameters Optimization of Steel Wire Reinforced Thermoplastics Composite Pipe</b><br>P. Shang, Y.X. Qu and J.J. Zhao   | 399 |
| <b>Preparation and Characterization of Hydroxyapatite Whiskers</b><br>M.H. Huang, Q.H. Chen, Y.S. Cui and W.B. Zhu   | 404 |
| <b>Preparation SiC Ceramic Composite Filtration Membrane Materials by Dry Pressing and Synchronous Sintering Method</b><br>K.F. Su, L.M. Wang, X.Y. Deng, J.B. Li, C.P. Wang, G.Q. Zhang, Y.N. Jing and C.Y. Bai | 409 |
| <b>Silty Clay and Fibre Interaction</b><br>A. Chegenizadeh and H. Nikraz   | 415 |
| <b>Study on Film-Forming Technique of Aluminum Composite Membrane Prepared by Inorganic Precursor Sol-Gel Method</b><br>L.L. Guo, H.M. Wang, W. Liu and M. Xu  | 421 |
| <b>The Research Progress of Nitinol Vascular Stent</b><br>J.L. Ma, M. Zhu, W.D. Miao, J.T. Li and Y.M. Kou   | 425 |
| <b>Fabrication and Characterization of NiO<sub>x</sub>/Bi<sub>2</sub>WO<sub>6</sub> with Enhanced Photocatalytic Activity under Visible Light Illumination</b><br>C. Ma  | 429 |
| <b>Study of Microstructure and Properties of Corundum-Calcium Hexaluminate Composite Aggregate</b><br>L.P. Fu, H.Z. Gu, B. Du, A. Huang and Z.K. Li  | 433 |
| <b>Adsorption of Congo Red from Aqueous Solution onto Chitosan/Rectorite Composite</b><br>T. Feng and L. Xu  | 438 |

## Chapter 4: Micro / NanoMaterials and NanoTechnologies

|  |     |
|--|-----|
| <b>A Molecule Computing Model for Maximum Independent Set Problem Based on DNA/AuNP Conjugation</b><br>J. Yang, C. Zhang and H. Wang | 445 |
|--|-----|

|   |     |
|---|-----|
| <b>Preparation and Photocatalytic Activity of Gadolinium–Doped ZnO Nanocrystalline Powders</b>                        |     |
| L.F. Chen   | 450 |
| <b>Preparation of Nanosized Barium Titanate Powder by a Direct Reactive Precipitation Method</b>                      |     |
| H.B. Li, S.Y. Wu, J. Wang and C.J. Li   | 454 |
| <b>The Development of Nanocrystalline Materials Prepared by Electrodeposition</b>                                     |     |
| M. Sun, N. Zhang, H.M. Kan, X.Y. Wang, F.Y. Yang and T.T. Fu  | 458 |
| <b>The Effect of PEG on the Preparation of Hydroxyapatite</b>   |     |
| Q.Z. Sun and H.B. Wang  | 462 |
| <b>The Effects of Surfactants on the Topography of HA</b>   |     |
| Q.Z. Sun and H.B. Wang  | 466 |
| <b>The Research of Influence on Fe-N Alloy Magnetism from Experiment Parameters</b>                                   |     |
| X.Z. Guo, R.H. Chen and W.F. Song   | 470 |
| <b>A Novel Hybrid System for the Fabrication of Electrospun Mat with Microspheres</b>                                 |     |
| S. Zhang and G.J. Jiang   | 475 |
| <b>Enhanced Field Emission from Carbon Nanotubes Coated by Nanoparticles of Turbostratic Stacked Graphenes</b>        |     |
| Q.T. Li, R. Hu, X.R. Zhao, Z.G. Li and Y.P. Liu   | 479 |
| <b>Preparation of Aluminum Nanoparticles and Oxidation Mechanism of Nano- and Micro-Particles</b>                     |     |
| L. Chen, L. Liu, Z. Li, C.J. Xiao and T. Wei  | 485 |
| <b>The Preparation and Properties of Porous Scaffold Made of Nano-Hydroxyapatite/Polyamide66</b>                      |     |
| Y. He, H. Lan, J. Liu and L. Guo  | 490 |
| <b>Studies on Crystallizations and Mechanical Properties of Polypropylene/Nano-TiO<sub>2</sub> Composites</b>         |     |
| C.P. Yang, Y.J. Wu and C.G. Liu   | 494 |
| <b>Thin Film Microcircuit Preparation in a Diamond Anvil Cell</b>   |     |
| J. Wang and B.J. Wu   | 499 |
| <b>Micro-Structure of a Special Sericite-Jade: a Preliminary Study Using XRD and SEM Analysis</b>                     |     |
| W. Fu, M.L. Yang, Q.H. Guo, X.R. Huang, M.C. Chai and W. Guo  | 503 |
| <b>Preparation of Expanded Graphite with Fe<sub>3</sub>O<sub>4</sub> Nanoparticles</b>                                |     |
| C.Y. Wang, M. Ma, C.L. Qin and G.W. Wen   | 507 |
| <b>Study on Catalytic Efficiency of Ag/N Co–Doped TiO<sub>2</sub> Nanotube Arrays under Visible Light Irradiation</b> |     |
| X. Kang, J. Qi, L. Ye, H. You and L.J. Hu   | 511 |
| <b>A Novel 5-Fluorouracil-Loaded Polyelectrolyte Nanoparticle Formulation</b>   |     |
| Y.L. Fan, B.Y. Fan, Q. Li, S. Leng and L.H. Ma  | 518 |
| <b>Aligned Nanofiber Arrays and Twisted Nanofiber Ropes via Electrospinning with Two Frames Collector</b>             |     |
| J. Zheng, Y.Z. Long, B. Sun, H.D. Zhang, J.C. Zhang and J.Y. Huang  | 523 |

## Chapter 5: Ceramic

|   |     |
|---|-----|
| <b>Effect of Type and Amount of Wetting Agent on the Formability and Bending Strength of Vitrified Bond Diamond Abrasives</b>   |     |
| W.S. Cheng, Y.B. Liu, W. Liu, D.T. Yang and Z.J. Jiang  | 529 |
| <b>Synthesis of Al<sub>2</sub>O<sub>3</sub> Ceramics Matrix Composites by Thermal Explosion under Pressure and Hot Pressing</b> |     |
| G.L. Zhao, C.Z. Huang, H.L. Liu, B. Zou, H.T. Zhu and J. Wang   | 534 |
| <b>Fabrication of ZrB<sub>2</sub>-Based Ceramics Doped with ZrSi<sub>2</sub></b>  |     |
| J. Li, Z.Q. Wei, Z.F. Zhang and J.J. Sha  | 538 |
| <b>Study of Domains and Size Effect of Curie Temperature in BaTiO<sub>3</sub> Nanoceramics</b>                                  |     |
| C. Fang and L.Y. Chen   | 542 |

|  |     |
|--|-----|
| <b>Study on Grindability Evaluation of Ceramic Materials Based on Interval Gray Principal Component Analysis</b> |     |
| J.M. Xia   | 546 |
| <b>The Progress of Amorphous Si-B-C-N Composite Ceramics</b>   |     |
| F.Y. Yang, N. Zhang, M. Sun, T.T. Fu, H.M. Kan and X.Y. Wang   | 550 |

## Chapter 6: Optical/Electronic/Magnetic Materials

|  |     |
|--|-----|
| <b>Emission Color Variation of <math>\text{Sr}_3\text{SiO}_5:\text{Ce}^{3+}, \text{Li}^+</math> Phosphor for Near-UV Light-Emitting Diodes by Co-Doping with <math>\text{Mg}^{2+}</math> and <math>\text{Ba}^{2+}</math></b> |     |
| P.P. Zhu, T.W. Huang, X.J. Wang, H.L. Li and Z. Sun  | 555 |
| <b>First-Principles Investigations of Structural Stability of LuN</b>  |     |
| X.C. Yang, E.J. Zhang, H.Y. Ma and J.P. Xiao   | 559 |
| <b>InAlN/GaN HEMT Small-Signal Parameter Extraction</b>  |     |
| X.W. Zhang, P. Xu, K.J. Jia, Z.H. Feng and Z.P. Zhao   | 564 |
| <b>Influence of Deposition Temperature of ZnTe Films on Silicon by Thermal Evaporation</b>   |     |
| J.S. Lin, S.S. Wei, Y.T. Yu, C.H. Hsu, W.H. Kao, W.S. Chen, C.F. Tseng, C.H. Lai, J.M. Lu and S.P. Ju  | 569 |
| <b>Preparation and Characterization of a Novel Gadolinium Triple-Decker Sandwich-Type Complex with Tetrabenzoporphyrin Ligand</b>  |     |
| Q.F. Liu   | 573 |
| <b>An Integrated Evaluation Model for New Product Development in Light-Emitting Diode Plant Lighting Industry</b>  |     |
| W.C. Chen, L.Y. Wang and H.P. Chang  | 577 |
| <b>Casted Strip Character of Twin-Roll Casted High Strength Non-Oriented Electrical Steel</b>  |     |
| Y.Q. Wang, X.M. Zhang, T. Zhang and Z.M. Fan   | 582 |
| <b>DFT Studies on the Electronic Spectrum and the Second-Order Nonlinear Optical Properties of Donor-Acceptor Helicenes</b>  |     |
| X.W. Zhang, J.Q. Xu and M.L. Liu   | 586 |
| <b>Ferromagnetic Material of the Nearly Half-Metallic Alloy <math>\text{Co}_2\text{TiGa}</math></b>  |     |
| H.P. Han   | 590 |
| <b>Luminescence Properties of <math>\text{ZnO}:\text{Eu}^{3+}</math> Red Emitting Phosphor Prepared by Precipitation Method</b>  |     |
| L.Y. Jia, Z.B. Shao and J.F. Han   | 594 |
| <b>Magnetic Material Based on Full-Heusler Alloy <math>\text{Co}_2\text{CrGa}</math></b>   |     |
| H.P. Han   | 598 |
| <b>Structural Stability, Electronic and Optical Properties of Ni-Doped Boron Carbide by First Principles Calculation</b>   |     |
| J.L. Fan, Y. Wei and S.K. Lu   | 602 |
| <b>Study the <math>I</math>-<math>V</math> and <math>C</math>-<math>V</math> Characterization of n-ZnO/p-Si Heterojunction</b>   |     |
| X. Chao, L.H. Ding, X. Jin, C. Lei, H.C. Yuan, X.F. Zhu, Z. Yan and X.C. Zhou  | 607 |
| <b>Study of Optical Characteristics of <math>\text{H}_2\text{S}</math> Molecule Adsorption on <math>\text{Ag}_n</math> (<math>n=3,5</math>) Clusters</b>   |     |
| H. Zhou, J.Q. Wen, J.F. Wang and J.F. Wang   | 611 |
| <b>Preparation of Stilbene-Eighteen Alkyl Quaternary Ammonium Salts as Fluorescent Brightening Materials and Surfactants</b>   |     |
| M.S. Wan, C.B. Cao, H.Y. Sun, M.Y. Wang and W.Q. Ma  | 615 |
| <b>Synthesis and Properties of Novel Hole-Transporting Materials Containing Triphenylamine and Bipyridine Units</b>  |     |
| H.J. Lv, Y.F. Yu, L. Liu, A.B. Chen, Z.C. Hu and K. Huang  | 619 |
| <b>Electronic Properties of ZnO Doped by Rare-Earth Elements from First-Principles</b>   |     |
| L.L. Chen, H.D. Hu and Z.H. Xiong  | 623 |
| <b>The Influence of <math>\text{B}_2\text{O}_3</math> on the Luminescence Behavior of <math>\text{ZnGa}_2\text{O}_4</math> Phosphor at Different Sinter Temperatures</b>   |     |
| R.X. Zhong, Z.R. Liu and J.Q. Qi   | 627 |

## Chapter 7: Functional Materials

|   |     |
|---|-----|
| <b>Carbon Cloth Diffusion Layer for Fuel Cell Electrode</b><br>X.J. Zhang, Y.D. Li, Y.H. Tian, S.Q. Wang and L. Zhang   | 635 |
| <b>The Influences of Zirconia on the Properties of Magnesia Alumina Spinel Bricks</b><br>S.S. Hong and Y. Li  | 639 |
| <b>Ti<sub>2</sub>AlC/TiC Functionally Graded Material Fabricated by Reaction Sintering</b><br>Y.L. Chen, M. Yan, P.J. Lu, Z.Y. Li and C.W. Zeng   | 643 |
| <b>The Microstructure and Thermo-chromic Properties of La<sub>1-x</sub>Sr<sub>x</sub>MnO<sub>3</sub> Smart Materials</b><br>M. Xu, Z.H. Fu, L. Li, J.B. Wang, C.H. Wu, Y.Z. Zhao and H.P. Zuo | 648 |
| <b>Investigation on the Creep property of Theoretical Composition Magnesia Alumina Spinel Bricks</b><br>S.S. Hong and Y. Li   | 654 |
| <b>Influence of Fe<sub>2</sub>O<sub>3</sub> on the Hydration Resistance of MgO-Al-C Bricks</b><br>J.C. Wei, S.J. Yuan, X.M. Ji, L.X. Yu and J.B. Tu   | 658 |
| <b>Effects of Sodium Salt on Hot Mechanical Properties and Microstructure of MgO-Al-C Bricks</b><br>J.C. Wei, X.M. Ji, J.K. Huang, C.H. Gao and J.B. Tu                                       | 662 |
| <b>Use of Waste Tire Rubber Particles as a Part of an Aggregate Added to Thermal Insulating Mortar</b><br>D. Huang, X. He, H.L. Lin, K. Sun and Q. Ye   | 666 |

## **Chapter 8: Building Materials, Construction, Soil Behavior, Architecture and Urban and Land Planning Applications**

|   |     |
|---|-----|
| <b>Building Energy-Saving Technology and its Application Based on Low Carbon Concept</b><br>H. Yan  | 673 |
| <b>Built-In Spiral Ripe Thin-Walled Square Steel Tube Concrete Column of Nonlinear Finite Element Analysis</b><br>L.S. Wang and B.S. Li                           | 678 |
| <b>Effects of Clay on Flow Properties of Polycarboxylate Superplasticizer and its Control Measure</b><br>X. Liu, Z.M. Wang, H. Wu and H.Q. Li                     | 682 |
| <b>Effects of Ferrocement in Strengthening the Serviceability Properties of Reinforced Concrete Structures</b><br>S.U. Khan, M.F. Nuruddin, T. Ayub and N. Shafiq | 686 |
| <b>Elementary Discussion on the Treatment of Old Road Problems in Upgrading and Reconstructing for the Road</b><br>H.W. Feng and Y.M. Wu                          | 691 |
| <b>Finite Element Analysis for Concrete Filled Double-Skin Steel Tubular Stub Columns</b><br>Y.Z. Wang and B.S. Li  | 696 |
| <b>Preparative Techniques and its Performance of Chemically Foamed Cement Paste</b><br>X.W. Ma and X.Y. Li  | 700 |
| <b>Research on Building Low-Carbon Hotels from the Perspective of Circular Economy</b><br>Q. Li and L. Li   | 704 |
| <b>Research on Mass Concrete Construction Techonogy of Raft Foundation of Hongyun Building</b><br>S.H. Yin, Y. Huang and Y.H. Yuan                                | 709 |
| <b>Short- and Long-Term Deflection of Concrete Structures</b><br>L. Zhang and J. Tian   | 714 |
| <b>Stability Bearing Capacity of Concrete Filled Thin-Walled Circular Steel Tubular Column under Axial Compression</b><br>X.P. Zhang                              | 720 |
| <b>Study on Clinker Production Using Magnesium Slag on a 4500tpd Line</b><br>F. Lu, R.Y. Bai and J.W. Cai   | 724 |
| <b>Study on Crack Spacing and Width of Expansive Soil due to Evaporation</b><br>J.H. Wu and S. Yang   | 728 |
| <b>Study on Medium Density Radial Bamboo Curtain Composite Plybamboo</b><br>C.G. Du and C.D. Jin  | 734 |



|   |     |
|---|-----|
| <b>Study on Particle Characteristics of Cement by Vertical Roller Mill Finish Grinding</b><br>W.H. Liu, R.Y. Bai and J.W. Cai   | 738 |
| <b>Study on the Axial Ultimate Bearing Capacity of Concrete-Filled Square Steel Tubular Stub Columns</b><br>P. Wu, J.F. Xu, J.H. Zhao, Q. Zhu and S. Wang   | 742 |
| <b>Test of Dynamic Strength Characteristics of Paleosol</b><br>N.Q. Wang, X.L. Liu, Y.Q. Xue and X.P. Jiao  | 747 |
| <b>Test Research on Stiffness of Loaded Concrete Beams Strengthened with Prestressed CFRP Sheets</b><br>D.H. Cheng and P. Zhang   | 752 |
| <b>The Affecting Factors of Slope Stability Based on Orthogonal Design</b><br>Z.R. Jiang and L.H. Wang  | 756 |
| <b>The Effects of Steel Content for the Mechanics Performance of Fiber Modified Polymer Resin Concrete</b><br>Y.J. Jin, L.G. Xiao and F. Luo  | 760 |
| <b>The Guidance Pattern of Countryside Sustainable Development of Three Gorges Reservoir in Chongqing</b><br>J.X. Zhou and L. Peng  | 763 |
| <b>The Influence on the Concrete Durability in Bleed Air Performance Caused by Concrete Admixture</b><br>Y.X. Zheng and X.G. Zhu  | 767 |
| <b>The Inhibition Studying of Many-Doped Mineral Admixture for Concrete Alkali Silicate Reaction</b><br>X.G. Zhu and K. Cao   | 771 |
| <b>The Inhibition Studying of Single-Doped Mineral Admixture for Concrete Alkali Silicate Reaction</b><br>X.G. Zhu and G.S. Chen  | 776 |
| <b>The Inspiration from the Slow-Traffic and Lingering Characteristics of the Inhabited Bridge</b><br>C.X. Yang   | 781 |
| <b>The Studying of Reinforcement Mechanism of Fully Grouting Rock Bolt in Brittle Wall Rock Mass</b><br>X.G. Zhu  | 786 |
| <b>Towards a Competitive City: Shanghai's Urban Development</b><br>Z. Li and T.J. Zhang   | 793 |
| <b>Unified Solution of the Ultimate Bearing Capacity for Stiffened and Thin-Walled Square CFST Short Columns under Axial Compression</b><br>J.F. Xu, P. Wu, J.H. Zhao, Y. Li and W.B. Liang   | 797 |
| <b>A Review of Detection, Evaluation and Repair Technology for Hydraulic Concrete Structures</b><br>L.Y. Xiao   | 805 |
| <b>Active Countermeasure Mechanism to Waste Dump Based on Spatial Effect</b><br>X.Y. Teng and H.B. Wang   | 811 |
| <b>Analysis on Characteristics of Ancient Kiln Village in Mengjiajing</b><br>Y.X. Qu, X.D. Zhu and C.E. Wang  | 816 |
| <b>Analysis On Morphology Of Settlement and Residence In Wangyu Village</b><br>J. Su and J.P. Wang  | 820 |
| <b>Analysis on Seismic Behavior of Structures Supported by Foundations with Different Locations</b><br>L.P. Wang, H.P. Zhong and L.Q. Huang   | 824 |
| <b>Concrete Slab Value Stream Mapping of Brazilian Residential Buildings - a Lean Construction Study Case</b><br>P.S.P. Fontanini, C.d.S. Milano, A. Fujimoto, R.C.C. Lintz, L.A. Gachet-Barbosa, A.E.P.G.A. Jacintho and L.L. Pimentel | 829 |
| <b>Effect of Pore Structure on the Chloride Permeability of Concrete with Mineral Admixture</b><br>Y.J. Hu and Y.L. Du  | 835 |
| <b>Energy Conservation Technology in BedZED and the Enlightenment for China</b><br>Y.W. Xue and C.L. Meng   | 839 |

|  |     |
|--|-----|
| <b>Evolution and Significance of the Residential Area of Landscape Design</b><br>H.Y. Guo and Y.N. Cai   | 843 |
| <b>From the National Historical and Cultural City of Shanxi DaiXian see Ancient Frontier Town History Culture and the Characteristics of the Development of City</b><br>Y.J. Liu and J.P. Wang | 847 |
| <b>From the View of Qujia Courtyard House of Shan Xi Dwellings Traditional Cultural Value</b><br>R. Du and J.P. Wang   | 851 |
| <b>Method and Trend of Residential Landscape Design</b><br>H.Y. Guo and Y.N. Cai   | 856 |
| <b>Paying Attention to the Application of Ecological Strategy to Construction Design</b><br>Z. Du and Y.S. Zhang   | 860 |
| <b>Production of Concrete Blocks with Residues for Civil Construction</b><br>M.M.d. Camargo, R.C.C. Lintz, L.A. Gachet-Barbosa and M.S.G. Pires  | 865 |
| <b>Protection and Sustainable Development of Jiexiu Ancient City</b><br>Y. Xu and J.P. Wang  | 870 |

## **Chapter 8: Building Materials, Construction, Soil Behavior, Architecture and Urban and Land Planning Applications**

|   |     |
|---|-----|
| <b>Research and Application of Corundum Based Self-Flowing Castable Refractories</b><br>J.C. Wei, S.X. Liu, H.M. Zhang, L.X. Yu and J.B. Tu         | 877 |
| <b>Research on Axial Behavior of Thin-Walled T-Shaped Steel Stub Columns Filled with Recycled Demolished Concrete Lump</b><br>A.H. Jin and B.S. Li  | 881 |
| <b>Research on Spacial Displacement Regulations in Soft Surrounding Rock Tunnel</b><br>B.L. Lin   | 886 |
| <b>Soil Erosion Assessment in the Watershed of Dehua District of Fujian Province</b><br>Y. Zhang, B. Song, J. Wang and H. Sun                       | 890 |
| <b>Studies on RC Beams Strength with Steel Wires Using Nolinear Finite Element Method</b><br>C. Song, J.Y. Zhou and H.M. Zhang                      | 895 |
| <b>Study on Influencing Factors of CFST Arch Bridge Stability</b><br>H.Y. Tao   | 900 |
| <b>Study on Recognized Mode of the Revolutionary Site Protected Object in Traditional Village</b><br>N.N. He, X.D. Zhu and C.E. Wang                | 905 |
| <b>The Cause of Cracks in the Cement Concrete Pavement of County-Highway and Precautionary Measures</b><br>Z.D. Guo, L.J. Yi, J.Y. Liu and D.Q. Xu  | 909 |
| <b>The Finite Element Analysis of Thin-Wall Ribbed Square Steel Tube Recycled Concrete Bias Column Mechanical Properties</b><br>Y.H. Li and B.S. Li | 914 |
| <b>Thermal Conductivity of Fired Clay Bricks Incorporated with Cigarette Butts</b><br>N.A. Sarani and A.A. Kadir                                    | 919 |
| <b>Study on the Natural Vibration Characteristics of Jointed Slope</b><br>M. Wang, H.B. Li, Y.Q. Liu and X.C. Huang                                 | 925 |
| <b>The Evaluation System of Urban Low-Carbon Level</b><br>Y.T. Ma and C.J. Ma   | 933 |
| <b>Analysis of the Effect of Natural Slope Stability due to Tunnel Excavation in Mountainous Areas</b><br>X.L. Liang, F. Wang and G.L. Hao          | 938 |

## **Chapter 9: Energy Materials**

|   |     |
|---|-----|
| <b>Effect of Argon Gas Flow on the Thermal Field in a Directional Solidification System for Multi-Crystalline Silicon</b><br>X.R. Ma, W. Zan and X.L. Zhang | 945 |
|---|-----|

|   |     |
|---|-----|
| <b>Effect of Sodium-Based Slag Treatment on the Distribution of Impurities in Metallurgical Grade Silicon</b>                                   |     |
| M. Fang, C.H. Lu, H.X. Lai, L.Q. Huang, J. Chen, J.T. Li, W.H. Ma, K.X. Wei, Z.L. Sheng, J.N. Shen and X.T. Luo                                 | 949 |
| <b>Maximized On-Demand Hydrogen Generator Design</b>  |     |
| C.H. Chao and T.C. Jen  | 954 |
| <b>Purification of Silicon by Solvent Refining with Si-Sn Alloy</b>   |     |
| C.H. Lu, M. Fang, H.X. Lai, L.Q. Huang, J. Chen, J.T. Li, Z.L. Sheng, J.N. Shen and X.T. Luo  | 962 |
| <b>Studies on the Electrochemical Behavior of SiO/C Anode Materials by AC Impedance Method</b>  |     |
| J. Wang, J.M. Tian, J.C. Wei and C.M. Wang  | 967 |
| <b>Summarize the Studies on Improving the Electrochemical Performance of Spinel LiMn<sub>2</sub>O<sub>4</sub></b>                               |     |
| F.L. Wang, H.D. Xue, K. Wang, P. Liu and Y.Q. Bai   | 971 |
| <b>Temperature Distribution of Multi-Crystalline Silicon Ingots in the Directional Solidification Process</b>                                   |     |
| X.R. Ma, W. Zan and X.L. Zhang  | 977 |
| <b>Cathode Material Li [Li<sub>0.2</sub>Mn<sub>0.44</sub>Ni<sub>0.18</sub>Co<sub>0.18</sub>]O<sub>2</sub> Synthesized by Molten Salt Method</b> |     |
| G.X. Fan, H.L. Li, S.P. Dai, C.X. Zhang, X.M. Guan and Z.R. Chang   | 981 |
| <b>Fabrication of Micro DMFC Stack Using MEMS Technology</b>  |     |
| C.G. Suo, W.B. Zhang and S. Su  | 985 |
| <b>Mathematical Modeling of a DMFC Cathode with a Double Catalyst Layered Structure Membrane Electrode Assemblies</b>                           |     |
| C.G. Suo, W.B. Zhang and D.D. Wang  | 989 |

## Chapter 10: Environmental Friendly Materials, Treatment and Removal Technologies

|  |      |
|--|------|
| <b>A Technological Method to Improve the Filtration Efficiency of Fiber Materials</b>  |      |
| W.J. Fu and W. Liang   | 995  |
| <b>Effects of Laccase on the Properties of Hemp Fabric</b>   |      |
| X.L. Zhang and Y.D. He   | 999  |
| <b>Experimental Study on Cr<sup>6+</sup> Adsorption in Water about the Daily Waste Peanut Shell</b>                                      |      |
| C.J. Wang, T.H. Li, L.L. Tang, Z. Zou, W.J. Liu, J. Xie and Y. Wang  | 1003 |
| <b>Preparation and Mechanical Properties of the Environmentally Friendly Wood-Plastic Composites</b>                                     |      |
| H.W. Lu, M.Y. Li, B. Zhang, H. Yu and X.N. Jiang   | 1008 |
| <b>Preparation of Calcium Sulfate Anhydrate Whisker and a Primary Investigation of its Arsenic Removal Performance</b>                   |      |
| X.J. Chen, L.C. Yang, J.F. Zhang and Y. Huang  | 1013 |
| <b>Removal of Natural Organic Matter of Artificial Lake by Modified Fly Ash</b>  |      |
| C.N. Wu, L. Wang, Q. Ling, Y.C. Tang, J. Huang and F.K. Pan  | 1020 |
| <b>Study on the Environmental Friendliness of Biomass Dishware Based on Life Cycle Assessment</b>  |      |
| A.F. Guo, J. Zhao, J.F. Li, F.Y. Li and A.Q. Wei   | 1024 |
| <b>Surface Morphology and the Adsorptive Behavior of Coconut Active Carbon</b>   |      |
| X.Q. Li and L.J. Lan   | 1029 |
| <b>Adsorption Characteristic of Steel Slag Haydite for Phosphorus Removal from Wastewater</b>  |      |
| X. Liu, M. Yang and Y. Yang  | 1033 |
| <b>Adsorption of Cr(VI) from Aqueous Solution by two Kinds of Pillared Bentonites</b>  |      |
| Z. Wang, Z.S. Cheng, Y. Liu, N.N. Bo and S.P. Li   | 1037 |
| <b>Column Experiment on Cr (VI) Reduction with SiO<sub>2</sub>-Coated Fe Nanocomposites</b>  |      |
| Y.C. Li, K.J. Liu and B.Z. Ren   | 1041 |
| <b>Early Strength Characteristics of Palm Oil Fuel Ash and Metakaolin Blended Geopolymer Mortar</b>                                      |      |
| M. Ismail, T.O. Yusuf, A.H. Noruzman and I.O. Hassan   | 1045 |
| <b>Influence of Organic Alkali on the Preparation of Lignin-Based Anionic Adsorbents and their Performance in the Removal of Nitrate</b> |      |
| Z. Wang, N.N. Bo, Z.S. Cheng, Y. Liu and Y. Liu  | 1049 |

|   |      |
|---|------|
| <b>Strength and Durability Characteristics of Polymer Modified Concrete Incorporating Vinyl Acetate Effluent</b>  |      |
| A.H. Noruzman, M. Ismail, M.A.R. Bhutta, T.O. Yusuf, I.A. Shehu and I.O. Hassan   | 1053 |
| <b>Study on Production Technology of Paper Wooden Compound Pallets</b>  |      |
| J.H. Guo, J.Y. Huang, X. Sun, S.L. Wu and J. Ma   | 1057 |
| <b>Synthesis of Epoxidized Soybean Oil via Phase Transfer Catalysis</b>   |      |
| L. Jing, G.Q. Liu, X.Q. Liu and X.D. Wang   | 1061 |
| <b>Tertiary Treatment of Paper Industries Effluent with Advanced Electrochemical Oxidation Process in the Presence of Modified Bentonite Powdery Electrodes</b> |      |
| Z. Wang, Z.S. Cheng, Y. Liu, N.N. Bo and Y. Liu   | 1065 |
| <b>Analysis on Distribution Law of Damaged Filters for Bag Dedusters in Coal-Fired Power Plants</b>   |      |
| Y.S. Zhang, M.F. Xu, H. Shen and Y.Y. Tao   | 1069 |
| <b>Factors Influencing the Removal of As(V) from Groundwater by NF/RO</b>   |      |
| W.F. Ma, W.J. Liu, P.Y. Zhang and H. Guo  | 1074 |
| <b>Effect of Preparation Method on Photocatalytic Activity of Titanium-Bearing Blast Furnace Slag</b>   |      |
| X.F. Lei, X.X. Xue and H. Yang  | 1081 |
| <b>The Influence Factors of Compressive Strength and Production of Mineral Polymer of Aluminum Rocks in Xiuwen County, Guizhou Province, China</b>              |      |
| J. Zhang, Q.Q. Li and Y.Q. Xiong  | 1086 |
| <b>Characterization of some Key Industrial Waste Products for Sustainable Concrete Production</b>   |      |
| I.O. Hassan, M. Ismail, A.H. Noruzman, T.O. Yusuf, T. Mehmannaavaz and J. Usman   | 1091 |
| <b>A Study on Wellsite Wastewater Reinjection Stratigraphic Control in Changqing Oilfield</b>   |      |
| R. Chen, Z.W. Lei, D. He and P.K. Jin   | 1095 |
| <b>Effects of Latency Removal on the Fiber Properties of Poplar APMP</b>  |      |
| L. Qu, J.C. Chen and G.H. Yang  | 1101 |
| <b>Green and Efficient Coal Slurry Drying Process</b>   |      |
| Q.L. Zeng, X.P. Li, X.H. Wang, B. Zhang and Z. Cui  | 1105 |
| <b>Study on Factors and Operation of Granulation Method for Strontium Removal</b>   |      |
| X. Luo, M.W. Shi and H.C. Yin   | 1109 |
| <b>The Influence of Ph Value on the Treatment of Direct Sun-Proof Dyes Wastewater by Iron Trichloride</b>   |      |
| Y.P. Tian and B. Wang   | 1113 |
| <b>Preliminary Study of Utilizing Ozone in Treatment of Operationally Exhausted Metalworking Fluids</b>   |      |
| K. Gerulová, E. Buranská, Z. Turňová and J. Fiala   | 1117 |
| <b>Purification Effect of Self-Aeration Constructed Wetlands on COD</b>   |      |
| H.X. Xia and Q.H. Zhu   | 1122 |
| <b>Research on Removing Radioactivity Minerals Form Titanium Rough Concentration of Haibing</b>   |      |
| H.P. Zhang, X.M. Chen, Y.Y. Tang and Q.B. Cao   | 1127 |
| <b>Selection of Substrate Diameter and Filling Thickness for Artificial Wetland</b>   |      |
| H.X. Xia and Q.H. Zhu   | 1132 |
| <b>Study on Cyclone Dust Removal Equipment after Dense Phase Semi-Dry Flue Gas Desulfurization System</b>   |      |
| B.R. Liang, C.Y. Song, Z.S. Tong, Q. Jia, X.N. Lu and Y. Zhang  | 1136 |
| <b>Effect of Wet Storage on High Yield Pulping with <math>H_2O_2</math>-<math>CoSO_4</math></b>   |      |
| Z. Shang, B. Sun, Y.X. Liu, H. Li, R.C. Zhu and L. Bao  | 1143 |

## Chapter 11: Earthquake Resistant Structure, Materials and Design

|  |      |
|--|------|
| <b>Dynamic Response of the Compound Structure of Foam Aluminum Core Composite Sandwich Material to the Shock Wave of Gas Explosion</b> |      |
| X.H. Mao   | 1149 |
| <b>Seismic Hazard Estimation in East China Offshore Areas</b>  |      |
| L.F. Zhang, Y.J. Peng and Z.M. Wang  | 1158 |

**Aeolic and Seismic Structural Vibrations Mitigation on Long-Span Cable-Supported Bridges**

M. Domaneschi, L. Martinelli and C.X. Shi

1168

**On the Generation of Seaquake Velocity Fields for Submerged Floating Tunnel Structures**

C.X. Shi and L. Martinelli

1172

**Chapter 12: Biomaterials and Biotechnology****Activation Energy of Pure and Impregnated Lignocellulosic Materials Obtained by Isothermal Method**

C. Tomas, M. Jozef, B. Karol and Z. Turnova

1179

**Adsorption of Acid Red by Porous Chitosan Film**

T. Feng, L. Xu and F. Zhang

1184

**Asymmetric Synthesis of Ethyl (*R*)-4-Chloro-3-Hydroxybutanoate with a Two Recombinant *Escherichia coli* System**

K.J. Jing and W.T. Ban

1188

**Comparison of the Roles of Tea Polysaccharides and Polyphenols in Growth Inhibition of Hepatoma H22 Cells in Mice**

Y.L. Fan, W.H. Wang, Y.S. Hu, Q. Rong, A.G. Teng and A.J. Liu

1193

**Effects of the Protein in Wheat Straw on Enzymatic Hydrolysis**

H. Chen, L.J. Wang, T. Zhang, M. Yu and X.M. Wang

1198

**Enzymolysis Optimization of Walnut Residue Protein Using Trypsase**

S.Y. Zhang and Y.Z. Ren

1203

**Immunomodulatory Activity in Vivo of Porcine Cartilage Polysaccharide Nanoparticles on Murine H<sub>22</sub> Hepatocarcinoma Cells**

J.J. Fang, Z.Y. Zhu, A.G. Teng, G.Q. Zheng, W.H. Wang, J. Zheng and A.J. Liu

1208

**Influence of Cortical Layer Thickness of Alveolar Bone on Stress Distribution over Implant Supported Region**

C.T. Liao, C.G. Tseng, K.S. Shih and W.M. Chuang

1212

**Kinetics Study of Vitamin A Precursor Synthesis by Immobilized Lipase-Catalyzed Regioselective Monoacetylation in *n*-Hexane**

K.J. Jing, R. Duan, J.P. Sun, S.Z. Wang and Y.H. Lu

1218

**Mechanism of Peptide Changes during Drying Fermented Soybean Meal**

J.J. Guan, G.H. Yang, J.S. Wang and F. Jia

1224

**Numerical Simulation of Cell Growth Pattern and Determination of Fractal Dimension of Cell Cluster**

J.Z. Wang and Q.J. Guan

1229

**Optimization of Multi-Strain Solid State Fermentation to Improve the Content of Soybean Meal Protein by Response Surface Analysis**

G.H. Yang, J.J. Guan, J.S. Wang and F. Jia

1234

**Optimization of Solid State Fermentation to Improve the Degree of Hydrolysis Soybean Meal Protein**

F. Jia, B.Q. Han, J.J. Guan, G.H. Yang, J.S. Wang and B.J. Qi

1239

**Preparation and Characteristics of Chitin-Gelatin Composite Film**

Y.J. Wang, L. Jiang and S.X. Shao

1243

**Prokaryotic Expression and Purification of Tomato Cnr Protein**

Y.H. Xie, H. Liu and H.X. Zhang

1247

**Protein Extraction of the Long-Term Room Temperature Storage Wheat Straw**

T. Zhang, L.J. Wang and H. Chen

1252

**Research on Oxidation of Phenanthrene to Phenanthrenequinone with TBHP**

Y.J. Luo and Z.Y. Liu

1256

**Selectivity of the Cycloaddition of Tert-amyl Alcohol and  $\alpha$ -methylstyrene**

C.C. Xu, F.P. Zheng, Y.P. Liu, H.Y. Tian and B.G. Sun

1261

**Studies on Charcoal Block Production from Three Charcoal Types of Biomass Employing Screw Press Unit**

K. Lagoon, S. Sudajan and C. Junsiri

1265

|   |      |
|---|------|
| <b>Study of Physicochemical Properties of Chinese Small Cabbage(<i>Brassica chinensis</i> L.) Stored at Four Temperatures</b>                                 |      |
| L.P. Zhang, J. Xie, T. Wang and Q. Xiong  | 1275 |
| <b>Study on Hydrophobic Microorganism as Coal Bio-Desulfurizing Agent</b>   |      |
| D.C. Zhang, Z.X. Hou, T. Wang and Q.Q. Zhou   | 1282 |
| <b>Study on the Isolation of Polysaccharide from Purple Sweet Potato by DEAE-Cellulose 52</b>   |      |
| M.M. Guo, H.G. Tang, H.J. Yao and J.Z. Guo  | 1286 |
| <b>Synthesis and the Study of Oil Displacement Performance of Stearate-2-Hydroxy-3-Propane Sulfonic Acid Sodium Salt</b>                                      |      |
| Y.L. Hao, J.Y. Wang, R.M. Zhang and Z.B. Ma   | 1292 |
| <b>The Assessment of Sweet Sorghum Straw Bio-Feed Fermentated by the Compound Microbial Agent in Bags and Cellar Pits</b>                                     |      |
| S.Y. Wang, G.Q. Xiao, W.J. Li, J.H. Chen, J.P. Liang, J. Liu, X.Y. Zhang, H. Su and B.L. Jiang  | 1297 |
| <b>The Classification and Characteristic of Proteins in Wheat</b>   |      |
| J.S. Wang, F. Jia, X.J. Yang, B.J. Qi and L.B. Qu   | 1301 |
| <b>The Effects of <i>Rhodiola Tibetica</i> on Lung Tissue of Rats with High Altitude Pulmonary Edema</b>  |      |
| W.H. Li   | 1305 |
| <b>The Wool Shrink-Proof Technology of Sericin Bonding Wool</b>   |      |
| H.E. Wang   | 1310 |
| <b>Construction of Expression Vector with Fruit-Specific Promoter and Genetic Transformation of Strawberry</b>  |      |
| X.L. Song, Z.H. Wu, X. Zhang, M.X. Lu and B. Guo  | 1314 |
| <b>Determination and Identification of Chondroitin Sulfate from Tilapia Byproducts</b>  |      |
| Z.H. Duan, C.Y. Cheng, Y. Hai and J.L. Wang   | 1318 |
| <b>Effect of Xylanase Treatment on Papermaking Properties of Poplar High Yield Pulp</b>   |      |
| W. Wang, G.H. Yang and J.C. Chen  | 1322 |
| <b>Emulsifying and Foaming Properties of Wheat Gluten Influenced by High Pressure Microfluidization</b>   |      |
| N.J. Yan, G.Q. Liu, L.Y. Chen and X.Q. Liu  | 1327 |
| <b>Flame Retardation of Wood</b>  |      |
| L. Makovická Osvaldová and A. Osvald  | 1331 |
| <b>High-Purity Isolation of <i>Trans</i>-Resveratrol from <i>Rhizma Polygoni Cuspidati</i> by High-Speed Counter-Current Chromatography</b>                   |      |
| J.C. Deng, L.H. Li, X.Q. Yang, S.P. Lu, Y.Y. Wu, S.X. Hao and B. Qi   | 1335 |
| <b>Investigation of Airflow Influence on Self-Heating Process of Linseed Oil Using Safety Calorimeter SEDEX</b>   |      |
| I. Hrušovský, K. Balog, J. Martinka and T. Chrebet  | 1340 |
| <b>Isolation of <i>Saccharomyces Cerevisiae</i> GJ03 from the Spontaneous Fermentation Orange Wine and Application in the Course of Orange Wine Brewing</b>   |      |
| W. Xu, J. Wang and D.W. Zhang   | 1345 |
| <b>Mechanisms and Defiberation Point of <i>Dendrocalamus Giganteus</i> Munro Kraft Pulping</b>  |      |
| C.B. Zhou, J. He, Y. Chen and H.Y. Gao  | 1350 |
| <b>Optimization of The-Hydrolysis Parameters of Dissolving Pulp of Fast-Growing Poplar Producing</b>  |      |
| Y.B. Li, G.H. Yang and J.C. Chen  | 1354 |
| <b>Preparing Gambiered Guangdong Silk with Ultraviolet Radiation and Normal Mud/<math>\text{Fe}^{2+}</math></b>   |      |
| C. Chen, X.M. Ji, G.X. Zhang, F.X. Zhang and H. Zheng   | 1358 |
| <b>Purification and Preliminary Characterization of a Thermostable Lactase from <i>Bacillus coagulans</i> T242</b>  |      |
| S.J. Jiang, G.Q. Mu, T. Liu and F. Qian   | 1362 |
| <b>Research on the Antioxidation of <i>Torreya Grandis</i> Alcohol Extracts in Cholesterol-Fed Rats</b>   |      |
| Q. Fang and S.L. Jin  | 1366 |
| <b>Simulating Glycolytic Metabolism of <i>Escherichia coli</i> by Using Optimal Control Models</b>  |      |
| Q.H. Zhou, J. Xie, J. Cui and Y. Li   | 1370 |
| <b>Studies on the Preliminary Characterization of a Novel Exopolysaccharide Produced by <i>Streptococcus thermophilus</i> Strain from Tibetan Kefir Grain</b> |      |
| S.J. Jiang, F. Qian, X.H. Ren and G.Q. Mu   | 1374 |

|   |      |
|---|------|
| <b>Study on Deproteinization of Polysaccharide from Corn Silk with Cetyl Trimethyl Ammonium Bromide</b><br>H.L. Zhou, G.Q. Song and M. Zhang  | 1378 |
| <b>Study on Furfural Production from Hemicelluloses</b><br>B. Shen, Y.X. Liu, Y.X. Liu and J.H. Peng  | 1382 |
| <b>Study on Plant Growth Regulation Activity of the Low Polar Fractions from <i>Mikania micrantha</i> H.B.K. on <i>Phaseolus radiaus</i></b><br>R. Shi, B. Li, M. Ye, Y. Zhao, L.M. Fan and T.T. Cai  | 1386 |
| <b>Study on the Emulsifying Properties of Tilapia Skin Gelatin</b><br>G.H. Xia, X.R. Shen, Z. Liu, P. Li and Z.Q. Jiu   | 1390 |
| <b>Study on Extraction of Wasabi Plant Material Bio-Activity Substances and Anti-Cancer Activities</b><br>S.Q. Hu and W. Wei  | 1395 |
| <b>Study on Extraction Technology of Polysaccharide from <i>Pleurotus ostreatus</i></b><br>H.L. Zhou, L. Cheng and S. Lin   | 1400 |
| <b>The Ameliorative Effect of CPCC and Role of CRT in Hepatic Injury by Alloxan-Treatment</b><br>H.M. Yuan, D.F. Ming, S.Q. Ma and W.J. Fan   | 1404 |
| <b>The Influence on the Milk Yield and Milk Composition of the Cows after Feeding with the Sweet Sorghum Straw Fermented by the Compound Microbial Agent in Bags</b><br>S.Y. Wang, X.Y. Zhang, H. Su, G.Q. Xiao, W.J. Li, J.P. Lian, J.H. Chen, J. Liu and B.L. Jiang | 1410 |
| <b>The Spectrum Properties of Type I Collagen Self-Assembly Film</b><br>J.C. Zhang, H.P. Yan, G.W. Zhang and L. Zhang   | 1414 |
| <b>Theoretical Investigation on Tautomerization Mechanism of 6-Thioguanine</b><br>H.J. Ren  | 1418 |
| <b>Ugonin K Induces Cell Cycle Arrest and Apoptosis through Reactive Oxygen Species/Apoptosis Signal Pathway in Human Skin Cancer Cells</b><br>L.P. Chan, T.H. Chou, G.H. Wang, Y.P. Tseng, P.J. Chen, D.L. Cheng and C.H. Liang                                      | 1422 |
| <b>Clean Method for Stickies Control with StickAway Enzyme in ONP Pulps</b><br>J.C. Pei, Q.X. Dun, H.Y. Wang and F.D. Zhang   | 1426 |
| <b>Influence of Surface Zeta Potential on Adhesion of <i>Chlorella sp.</i> to Substratum Surfaces</b><br>X.R. Zhang, Z.Y. Jiang, H. Yuan, Y.X. Lu, L. Chen, A.H. Chou, H. Yan and X.X. Zhang  | 1431 |
| <b>Study on Amphiphilic Macromolecules Adsorbent of Cellulose Mixes Ether Based on Cotton Stalk</b><br>H.Y. Hao and Z.Q. Shao   | 1435 |
| <b>Production and Utilisation of Non-Conventional Coke</b><br>O. Němček, S. Honus and D. Juchelková   | 1440 |
| <b>High-Consistency Electrochemical Delignification of Poplar Kraft Pulp</b><br>Y.J. Zhong, F.G. Kong, S.J. Wang, H.Y. Zhan and W.B. Wang   | 1444 |
| <b>Gold Immunochromatography Assay - A Newly Rapid Detection Technique for Aquatic Products</b><br>Y. Wang, H.J. Yu, B.L. Qian, Y.Q. Cai, D.M. Huang, Y.H. Hui, H. Liu and B. Ma  | 1449 |
| <b>Using of Magnesium Hydroxide and Sodium Hydroxide in DP Beaching of NaOH-AQ Wheat Straw Pulp</b><br>W.B. Wang, F.G. Kong, S.J. Wang, Y.J. Zhong and G.H. Yang  | 1455 |
| <b>Preparation and Characterization of Regenerated Wool Protein PAN Blended Fibers</b><br>J. Wei, H. Liu, S.J. Xu, L.J. Zheng and B. Du   | 1461 |
| <b>Biocompatibility Research of the Biphasic Calcium Phosphate Composite Ceramic Film Obtained through Micro-Arc Oxidation on the Medical Titanium Surfaces</b><br>S.J. Dong, J.H. Bao and S.J. Sun   | 1465 |
| <b>Determination of Ignition Temperature of Organic Dust Layers</b><br>I. Turekova, Z. Turnová, J. Harangozo, I. Kasalova and T. Chrebet  | 1469 |

## Chapter 13: Chemical Materials and Chemical Technology

|   |      |
|---|------|
| <b>Preparation and Characterization of Alkylethoxyethanesulfonate in Superbasic System KOH-DMSO</b><br>R.X. Niu, H. Song, S.B. Sun and W.D. Ren | 1475 |
|---|------|

|  |      |
|--|------|
| <b>Preparation and Properties of Modified Lignin Used as Additive of Brown Coal CWS</b><br>J.M. Song, Y.X. Zhang and S.Q. Zhu  | 1479 |
| <b>Preparation of Aromatic Silanes as High Thermal Stability Coupling Agents</b><br>Y.L. Pan, B. Arkles and J. Kendenburg  | 1483 |
| <b>Removal Efficiency and Distribution Characteristics of PAHs in Coking Plant Contaminated Soils by <i>In Situ</i> Chemical Oxidation Remediation</b><br>W.F. Ma, H. Guo, J.D. Ye, D.M. Han and X.W. Ma                     | 1490 |
| <b>Cascaded Columns of Total Reflux Batch Distillation with Periodic Liquid Exchange</b><br>K. Tang and P. Bai   | 1495 |
| <b>Effects of Microwave Power on Performance of Pt/CeO<sub>2</sub>MWCNTs Catalysts Prepared by Microwave-Assisted Polyol Process for Methanol Electrooxidation</b><br>Y. Gu, C.T. Liu, J. Gao, K. Wang, Y.R. Sun and C.Y. Du | 1500 |
| <b>Experimental Study of Optimal Coagulation Effect on Three Kinds of Direct Sun-Proof Dyes by FeCl<sub>3</sub></b><br>Y.P. Tian and B. Wang   | 1504 |
| <b>The Evaluation of Factors Affecting the Performance of Heavy Oil Emulsion</b><br>Z.Z. Fan, T. Wang, P.P. Li, J.G. Wang and Q.W. Liu   | 1508 |
| <b>Kinetic of C.I. Reactive Black 5 by Fenton-Like Oxidation</b><br>Y.J. Du, G.P. Jiang, X.P. Fang and M.Q. Qiu  | 1512 |
| <b>Research on Tubing and Casing Corrosion in Sour Gas Reservoirs and Corrosion-Resistant Material Selection</b><br>L.F. Li  | 1516 |
| <b>Material Selection of Water-Ring Vacuum Pump in Yellow Phosphorus Tail Gas Industry</b><br>H.M. Yu  | 1520 |
| <b>Preparation of Strontium-Barium Hydroxyapatite by Coprecipitation</b><br>H.B. Shi, X. Tian, H. Zhong, Y. Liu and T. Wan   | 1524 |
| <b>Modified CuO/ZnO/Al<sub>2</sub>O<sub>3</sub> Catalysts for Methanol Synthesis from Co and CO<sub>2</sub> Co-Hydrogenation</b><br>W.G. Gao, H. Wang, W.Y. Liu and F.J. Zhang   | 1529 |
| <b>Study on the Reaction Kinetics and Catalytic Stability of Pillared Bentonite in Heterogeneous UV-Fenton Process</b><br>X. Zhang, H.L. Jiang and X. Chen   | 1535 |
| <b>Distribution and Bioavailability of Nitrogen Species in Street Dust from Small Towns in Yongchuan, Chongqing</b><br>S.M. Wang and H. Yu   | 1539 |
| <b>The Characteristics of Trace Metal Elements Accumulation and Distribution in Elsholtzia Harchowensis</b><br>S.X. Xiong, W.Y. Xie, C.C. Huang and M.Q. Qiu   | 1543 |
| <b>Dyeing of Cotton Fabric Modified by 2, 3-Epoxypropyl Triethyl Ammonium Chloride with Reactive Dyes</b><br>H. Liang, G.X. Zhang, F.X. Zhang, X.T. Xue and H. Zheng   | 1547 |

## Chapter 14: Polymeric Materials

|   |      |
|---|------|
| <b>Adhesion Loss in Antistripping Agent Treated Asphalt Binders due to Moisture</b><br>M. Arifuzzaman and R.A. Tarefder   | 1553 |
| <b>Experimental Research on the Solubility of Cellulose in Different Ionic Liquids</b><br>X.J. Li, Y.S. Sun and Q. Zhao   | 1568 |
| <b>Influence Analysis of the Parameters on Sound Absorbing Performance for Polymer Wool</b><br>Y.W. Huang, D.F. Wang, S.M. Chen, Z.W. Liu and H.L. Wang                             | 1572 |
| <b>Preparation and Properties of Silane-Terminated Poly(urethane-Imide)</b><br>X.X. Hu and Y. Wang  | 1577 |
| <b>Preparation of High Heat-Resistant Profile Based on PVC/<math>\alpha</math>-MSAN/ABS Ternary Blends</b><br>X. Wang, S.Y. Guo and F.H. Yang                                       | 1581 |
| <b>Study on Properties of Enzymatic Hydrolysis Lignin (EHL) and Chloride Polyethylene (CPE) Composites</b><br>A.B. Wang, X. Wang, H. Hong, Q.W. Yin, Y.H. Ye, B. Liu and X.S. Cheng | 1586 |



|   |      |
|---|------|
| <b>Study on Relationship between BPA Migration and Thermal-Oxidative Aging Degree of Polycarbonate</b>  |      |
| Y.X. Zhao, L. Zhao, Y.Y. Zhao, J.G. Gao, Z.L. Xiao and H. Wang  | 1590 |
| <b>Synthesis of a New Water-Soluble Conjugated Polymers Containing Thiazoline Moiety for Antibacterial Activity Bioassay</b>                    |      |
| J.P. Liu, Y.H. Wu, L. Liu, Y.M. Xiao, X.D. Ma and B. Fu   | 1594 |
| <b>Synthesis of Quaternary Ammonium Cationic Polymer PEA</b>  |      |
| R.M. Zhang, H.M. Shan, M. Zhao, D.H. Ma and W. Li   | 1599 |
| <b>Synthesis of UV-Writing Fluorinated Polymer for Organic Optical Waveguide</b>  |      |
| X. Fei, S.Q. Fan, J. Tian and Y. Wang   | 1604 |
| <b>The Studies on Crystallization of Polypropylene (PP)/Nano-TiO<sub>2</sub> Composites under Microwave Irradiation</b>                         |      |
| C.G. Liu, Y.J. Wu and C. Yang   | 1609 |
| <b>The Swelling Kinetics Study of Hydrogels Prepared by the Different Finesses Degrees of <i>Eupatorium Adenophorum</i></b>                     |      |
| H.B. Wen, X. Gao and H. Zhang   | 1615 |
| <b>Emulsifier-Free Core-Shell Hybrid Latexes from Castor Oil-Based Waterborne Polyurethane and Polyacrylate Containing Fluorine and Silicon</b> |      |
| C.Q. Fu, M. Xu, Z. Yang, Q.G. Lv and L. Shen  | 1620 |
| <b>Research on the Relationship between the Productivity of Antarctic Krill Chitin and its Fineness of Grind</b>                                |      |
| Y.J. Liang, Y.C. Ji, Y. Wang, Q.H. Wang and H. Li   | 1624 |
| <b>Synthesis and Properties of a Castor Oil-Based UV-Oligomer Comprising of Side-Chain Benzophenone</b>   |      |
| C.Q. Fu, Z. Yang, Z.X. Lu and L. Shen   | 1628 |
| <b>The Best Dosage of Polymer Dispersant in WDG by Zata Potential Method</b>  |      |
| S.J. Liu, Y.P. Li, W.H. Wu and Z. Wang  | 1632 |
| <b>The Surface Modification and Characteristics of Useful Expanded PTFE Composites by Photo-Radiation Methods</b>                               |      |
| T.H. Wu, K.S. Chen and L.H. Shen  | 1636 |
| <b>Study on Pretreatment Agent for Anti-Clogging in Polymer Flooding Wells</b>  |      |
| Q.G. Dang, J.P. Bian, H.L. Cheng, P. Wang and H.R. Jiang  | 1641 |
| <b>Synthesis of Poly(acrylic Acid Dodecyl Ester-Styrene-Maleic Anhydride) Terpolymer and Surface Modification of Glass Fiber</b>                |      |
| J.C. Wang, C.M. Liu, Q.C. Zhao and X. Dong  | 1645 |
| <b>Study on the Preparation of 2-Phenyl Imidazole Microcapsule and its Effect on Curing Epoxy Resin</b>   |      |
| A.J. Ma, Q.Y. Zhang and Y.Q. Shi  | 1649 |

## Chapter 15: Thin Films and Technology

|   |      |
|---|------|
| <b>Aluminum-Induced Crystalization of Amorphous Silicon Films Deposited by Megnetron Sputtering</b>   |      |
| J. Qian, W.M. Shi, J. Jin, J.R. Li and Y. Liao  | 1655 |
| <b>Electrodeposition and Properties of CuInS<sub>2</sub> Thin Films</b>   |      |
| H.F. Zhou and X.H. Chen   | 1659 |
| <b>On the Mechanism of Copper Oxide Reduction by Dielectric Barrier Discharge Plasma Using H<sub>2</sub> and Ar Mixture Gases</b>             |      |
| Z.J. Xu, B. Qi and L.B. Di  | 1664 |
| <b>Preparation and Properties of Cu<sub>2</sub>ZnSnS<sub>4</sub> Nanoparticles by Solvothermal Method</b>                                     |      |
| J.R. Li, W.G. Yang, W.M. Shi, Y. Liao, J. Qian and X.W. Shen  | 1668 |
| <b>Properties of Ohmic Contact of Au Electrode on Polycrystalline Mercuric Iodide</b>   |      |
| Y. Liao, W.M. Shi, W.G. Yang, J.R. Li, J. Qian and S.Y. Lu  | 1672 |
| <b>Characterization of TiO<sub>2</sub> Composite Film on Steel Obtained in Aluminate Electrolyte by PEO and the Photocatalytic Activities</b> |      |
| Y.L. Wang, M. Wang, Y.M. Qin, X.F. Shi, H.R. Guo and Z.J. He  | 1676 |
| <b>Effects of Preparing Conditions on NO<sub>2</sub>-Sensing Properties of Sputtered WO<sub>3</sub> Nano-Films</b>                            |      |
| F.Y. Sun, M. Hu and P. Sun  | 1680 |

|  |      |
|--|------|
| <b>Electrochromic Property of Sputtered Amorphous NiO Films</b><br>C.M. Wang, C.Y. Wen, Y.C. Chen, S.Y. Lin and S.T. Shiau   | 1685 |
| <b>Hydrogen Induced Modifications of Optical and Electric Properties in Mg Thin Films</b><br>G.Y. Cao, F. Fang, A.L. Zou, J.H. Zhang, X.Y. He, Y.M. Gao and N.Y. Zou   | 1690 |
| <b>Structure Characterization of W-Doped Vanadium Oxide Thin Films Prepared by Reactive Magnetron Sputtering</b><br>S. Chen, L.F. Zhang, S.J. Xiao and C.Z. Dong   | 1694 |
| <b>Study on Wurtzite-<math>\text{Sc}_x\text{Al}_{1-x}\text{N}</math> Thin Film: A Review</b><br>Y.B. Jia   | 1698 |
| <b>The Structure and Magnetic Properties of NiZn-Ferrite Films Deposited by Magnetron Sputtering at Room Temperature</b><br>S.J. Nie, H. Geng, J.B. Wang, L.S. Wang, Z.W. Wang, R. Xu, G.H. Yue, Y.Z. Chen and D.L. Peng | 1702 |
| <b>ZnSe Quantum Dot Films Deposition from Modified Chemical Solution with Sodium Citrate</b><br>L.Y. Chen, L. Zhang, H. Zhang, F. Yang, Z.M. Luo and C. Fang   | 1707 |

## Chapter 16: Mechanical Behavior, Fracture and Fatigue

|   |      |
|---|------|
| <b>Bending Ratcheting Behavior of Zircaloy-4 Alloy at Room Temperature</b><br>H.Q. Guo, H. Li, Y.C. Sun and W.W. Yu   | 1713 |
| <b>Experimental Study on Fatigue Behavior of 35CrMo Steel after Torsional Prestrain</b><br>S.Y. Wang, Z.Y. Wu, X.J. Yang and Z.Y. Ren   | 1718 |
| <b>First-Principles Study of the Elastic Properties of Hexagonal Phase <math>\text{ScA}_x</math> (<math>A=\text{H}, \text{He}</math>)</b><br>K.M. Fan, L. Yang, J. Tang, Q.Q. Sun and X.T. Zu | 1723 |
| <b>Improved Extend Finite Element Method for SIF Calculation</b><br>N.L. Lu and W.G. Zhan   | 1728 |
| <b>Mechanical Behavior Research of a Novel Bridge Tower Structure Based on Model Test</b><br>J. Zeng, W. Wang and X.J. Ye   | 1732 |
| <b>Numerical Simulation of the Effect of Temperature on the Failure Strength of Rock</b><br>L. Bu, T. Xu and Y.J. Zhang   | 1737 |
| <b>Reliability Study on Crack Growth Rate of ADB610 Steel</b><br>L. Wei, S.Y. Wang, G.S. Liu and X.J. Yang  | 1741 |

## Chapter 16: Mechanical Behavior, Fracture and Fatigue

|  |      |
|--|------|
| <b>Statistical Analysis of Fatigue Crack Growth Rate of Q345E Steel</b><br>E.C. Guo, S.Y. Wang, G.S. Liu and Z.Y. Ren  | 1749 |
| <b>Super Long Life Fatigue Properties of Rail Steel U71Mn and U75V</b><br>Z.F. Luo, S.M. Cui, Y.Z. Wu and Q.Y. Wang  | 1753 |
| <b>Analysis on Creep Behaviors at High Temperature and Fracture Morphology of P92 Steels</b><br>J. Yuan, H. Xu, X. Wang, Y. Yu, X.P. Mao and S.Y. Hu                         | 1757 |
| <b>Comparison of the Simulation and Experimental Fatigue Endurance Behaviors in T6-Treated Nanosized SiC Reinforced Al Alloy Composite</b><br>Y.S. Wei, S.K. Lu and P. Huang | 1762 |
| <b>Experimental Study on Out-Plane Crack Extension in Rimmed Steel</b><br>B.C. Yang, J.X. Liu, R.X. Guo and H.T. Xia   | 1767 |
| <b>Fracture Analysis on Drainage Pipe Socket of Boiler</b><br>X.X. Xu, Y.T. Feng, Y. Wang, X.G. Niu, Q. Wang and J. Ouyang   | 1771 |
| <b>High Cycle Fatigue Behavior of Eco7075-T73 Aluminum Alloy</b><br>G.Y. Kim, K.S. Kim, S.K. Kim, Y.O. Yoon, K.S. Cho and K.A. Lee   | 1775 |
| <b>Prediction of Fatigue Crack Growth of 2024-T351 by Grey <math>GM(1,1)</math> Model with Rolling Check</b><br>C.C. Ni  | 1779 |
| <b>Research on the Effect of Pre-Stress on Bending Stiffness of the Ball Screw Based on ANSYS</b><br>H. Xiao, D.W. Zhang, Y.G. Shi and Z.H. Sun                              | 1784 |

|  |      |
|--|------|
| <b>Study on Kinetic Competitions of Crystal Growth</b><br>T. He  | 1788 |
| <b>Tensile Characteristics of Polygonaceae Weed Roots in Slope Collapse Watershed</b><br>X.M. Zhang, S.W. Ding and S.X. Li         | 1792 |
| <b>The Fracture Failure Analysis of Shaft for Light Hydrocarbon Pump</b><br>W.M. Song, G.R. Yang, Y.F. Zhang, Y. Ma and Y. Hao     | 1796 |
| <b>Applications of a New Element Model of Solid Bodies in Plasticity</b><br>J. Ke  | 1800 |
| <b>Analysis of Fatigue Life and Influence Factors of Tubing with Initial Crack</b><br>Y.P. Cao and Y.H. Dou                        | 1806 |
| <b>Check on Structural Strength of Carbon Fiber Composite Field Kitchen Units</b><br>X.H. Zhang, H. Yang, S.L. Sheng and Z.S. Gong | 1810 |

## Chapter 17: Tooling Testing and Evaluation of Materials, Measurement

|   |      |
|---|------|
| <b>Investigation and Analysis on Transverse Crack Spacing Distribution in Continuously Reinforced Concrete Pavement in China</b><br>Q.M. Zhao, H.L. Zhang and Y.H. Wang | 1817 |
| <b>Numerical Solution of Constant-Q Fractional Order Integral Modeling</b><br>X. Li and H.L. Han  | 1821 |
| <b>Research of Baseball's Best Batting Position Changes with the Selection of Material of Baseball</b><br>L.P. Du, W. Li and W.S. Han                                   | 1826 |
| <b>Development of Hard Rock Cutting Tool with Advanced Diamond Composites</b><br>X.S. Li and Y. Sun   | 1831 |
| <b>Research on Properties of Materials Based on Extension Evaluation Method</b><br>Y.L. Liu   | 1836 |
| <b>Influence of Rear Earth Yb on the Specific Heat of Liquid Fe-Co-Yb Alloy</b><br>W.J. Yao, N. Wang and J.Y. Lee   | 1840 |
| <b>Lateral Non-Uniformity Charges Influence on Interface Trap Density (<math>D_{it}</math>) by Terman Method in the nMOS Fabrication</b><br>S.L. Chen and Y.F. Chang    | 1846 |
| <b>Ablation/Erosion Test Technology on C/C Composite Material Based on Plasma</b><br>B.L. Zha, D.Y. Huang, S.L. Qiao, D.W. Wang, W. He, Z.H. Zha and B.X. Li            | 1851 |
| <b>Evaluation of CO<sub>2</sub> Absorbent/De-Absorbent by AAO/CaO Membrane</b><br>C.C. Chen and Y.P. Wang   | 1856 |
| <b>Application and Evaluation of New Cold Insulation Material in Cold Insulation Structure of Oil and Gas Processing Device</b><br>S.W. Wang, L. Lin and G.Z. Wu        | 1860 |
| <b>On-Road Gaseous Emission Characteristics of China IV CNG Bus in Shanghai</b><br>D.M. Lou, S.L. Qian, Z.Y. Hu and P.Q. Tan  | 1864 |
| <b>A New Experimental Technique for Dynamic Material Properties</b><br>M.Z. Liang, X.Y. Li, F.Y. Lu and J.G. Qin  | 1872 |
| <b>On the Experimental Investigation of Rock Abrasiveness in Petroleum Engineering</b><br>Z. Wei, Z.G. Wang, X.J. Zhao and G.T. Feng                                    | 1878 |

## Chapter 18: Structural Strength and Robustness

|  |      |
|--|------|
| <b>Analysis on Sealing and Deformation of Exhaust Valve Housing of Marine Diesel Engine</b><br>J. Wu, S.L. Duan, Z.H. Wu, H. Xing and W.C. Zhang                       | 1887 |
| <b>Analyzing Bearing Capacity Influence due to Location of Bearing Push-Extend Reamed of the Push-Extend Multi-under-Reamed Pile</b><br>Y.M. Qian, H. Yu and R.Z. Wang | 1891 |
| <b>Characteristics of Thin Metal Plate Being Strengthened by Laser Irradiation</b><br>S.D. Choi, G.M. Kim and S.H. Yun   | 1895 |
| <b>Design of Variable Airship Mechanism Based on Finite Element Method</b><br>Z.Y. Xiao, M.Q. Yang, D.L. Ma and Z.N. Li  | 1899 |

|   |      |
|---|------|
| <b>Finite Element Analysis of the Strength of Ladder Type Structure of the Deep-Water AUV</b><br>D.J. Wei, L.H. Zhang, H.W. Zhang and F. Liu                                    | 1903 |
| <b>The Coupled Thermal and Mechanical Load Analysis in the 6S50MC-C Type Marine Diesel' Piston</b><br>J. Wu, S.L. Duan, Z.H. Wu, H. Xing and Q.A. Liu                           | 1909 |
| <b>The Finite Element Analysis of Ultimate Bearing Capacity of Initial Bending on the T-Axis Compression Component</b><br>Y.Y. Han, C.X. Zhang, Y.Q. Li, S.Y. Chen and C.S. Liu | 1914 |
| <b>Theoretical and Numerical Solution of Deflection of the Circular Ring under a Concentrated Force</b><br>X.Z. Wang  | 1919 |
| <b>Effect of Track Measuring Beam on the Bogie Frame Strength and Vibration Mode of Inspection Car</b><br>L.F. Wu and S. Qu   | 1923 |
| <b>Enhancement Design on Composite Blade Structure of Small Wind Turbines Using Finite Element Analysis</b><br>Y.T. Chou and S.Y. Hsia  | 1928 |
| <b>FEM Based Statics Analysis of the Main Steel Structure of Bucket Wheel Stacker-Reclaimer</b><br>P. Shang, W. Zhou, C.X. Li and Y.M. Guan                                     | 1933 |
| <b>Finite Element Analysis for the Collapse Accident of One 110kV Transmission Tower</b><br>M.J. Jian, D.Q. Zhang and G.C. Zhang  | 1940 |
| <b>Mechanical Strength Analysis and Structure Improvement of Diaphragm Chamber Based on Finite Element Method</b><br>X.Q. Ling, P. Fu, W. Zhang and Y. Chen                     | 1945 |
| <b>Numerical Simulation on Structural Strength of Cam Mechanism for Automobile Panel Die</b><br>D.S. Bi, X.L. Chen and L. Chu   | 1950 |
| <b>Research on Screw Pump Rotor Eccentricitys Influence on Sucker Rod Partial Abrasion through Contact Analysis</b><br>J. Zhu, L.Q. Zou, X.J. Yuan and L.W. Zhang               | 1955 |
| <b>The Application of AAR Load Spectrums in the Fatigue Assessment for G70 Tank Carbody</b><br>S. Qu, P.B. Wu and Z.H. Liu  | 1960 |
| <b>The Mechanical Property Comparison of Two Kinds of Counterweight Booms of Stacker Reclaimer</b><br>P. Shang, K.C. Qi, Y.X. Wang and Y.M. Guan                                | 1966 |
| <b>Acoustic Emission Signals Characteristics of Q345R at Tensile Progress in the Normal and Low Temperatures</b><br>F.F. Long, Q. Wang, Y. Song and W. Li                       | 1972 |

## Chapter 19: Theory and Application of Friction and Wear

|   |      |
|---|------|
| <b>Experimental Study of Dynamic Characteristics of Dry Friction Damping of Turbine Blade Steel</b><br>P.F. Zhao, Q. Zhang, J. Wu and D. Zhang                | 1979 |
| <b>Fever Analysis and Engineering Applications of the Heavy Machine Tool's Main Bearing</b><br>S.S. Chen, S.Q. Li, Z.P. Hua and C. Dai                        | 1983 |
| <b>Key Aspects in Addressing Friction in Coaxial Hydraulic Sealing Systems</b><br>T. Deaconescu and A. Deaconescu   | 1988 |
| <b>Progress on Facilities and Methodology to Evaluate Abradable Seal Coatings</b><br>Q.Y. Lu, J. Shen, Y.G. Yu, X.J. Ren, H.J. Xuan and T. Liu                | 1992 |
| <b>Study on Tribological Performances for Textured Bearing of ICE</b><br>F.M. Meng, T. Yang and T. Long   | 1999 |
| <b>The Analysis of the Influencing Factors about Friction and Wear Characteristics of the Piston Ring in Stirling Engine</b><br>D.Y. Yang, H. Xie and J. Gong | 2003 |
| <b>The Effect of Friction Coefficient on Fretting Fatigue Cracks</b><br>T. Guo, L. Wu, X.N. Liu and R. Guo  | 2008 |

|   |      |
|---|------|
| <b>Study Film Temperature Including Cavitation Effect of Sliding Bearing by CFD Method</b><br>F.M. Meng and T. Long                           | 2012 |
| <b>Research on the Reinforcement Mechanism of Stretched Rock Bolt and Analyzing of the Impact Parameters</b><br>X.G. Zhu                      | 2016 |
| <b>Application of CBN Cutting Tools in Hard Turning and Tool Wear</b><br>H.D. Zhao, L.B. An, P.Q. Yang and Y. Geng                            | 2022 |
| <b>Experimental Investigation on Ultrasonic Vibration Assisted Turning of Stainless Steels with PCD Tool</b><br>G.J. Dong, L. Zou and M. Zhou | 2026 |
| <b>Study of the Effect of Tool Wear on Cutting Ti6Al4V Process</b><br>S.B. Yang, H.C. Ni and G.H. Zhu   | 2030 |

## Chapter 20: Surface Engineering/Coatings

|   |      |
|---|------|
| <b>Arc-Spraying Composite Coatings on Mild Steel for Long-Term High-Temperature Oxidation Protection</b><br>Z.L. Zhang, Q.S. Wang, P.R. Wei and X. Gong   | 2039 |
| <b>Cracking Behavior of Two Kinds of Plasma Cladding Layers by Precursor Carbonization-Composition Process</b><br>J.B. Liu  | 2046 |
| <b>Effect of Pt Content on TGO Growth in EB-PVD TBC Systems with Niptal Bondcoats</b><br>P. Song and J.S. Lu  | 2051 |
| <b>Evaluation Hard Layers in Steel AISI 8620</b><br>N. Lopez-Perrusquia, M.A. Doñu-Ruiz, V. Cortes Suarez, D. Sánchez-Huitron, E.Y. Vargas-Oliva and I.J. Perez Montes De Oca                           | 2055 |
| <b>Formation of Hard Layers in Tool Steels</b><br>N. Lopez-Perrusquia, M.A. Doñu-Ruiz, S. Rodríguez-González, D.L. Rosado Cruz and F. Vasquez-Ramírez   | 2059 |
| <b>In-Flight Particle Behavior Measured by DPV-2000 System under Low Pressure Condition</b><br>N.N. Zhang, B. He, Z.L. Zhang, D.Y. Li, M.P. Planche and C. Coddet                                       | 2063 |
| <b>Process Characteristics and Experiment on Micro Arc Oxidation of Light Metals</b><br>Y. Wang, H.Y. Li and M.L. Shi   | 2067 |
| <b>Study on Water-Based Paint Stripper for Tinplate</b><br>N. Duan, Y.W. Gao, T. Zhang, K.M. Wu and Y.F. Zhang  | 2071 |
| <b>Surface Activity Research of Cationic Gemini Surfactants</b><br>Z.Z. Fan, L.L. Li, L.F. Zhang and Q.W. Liu   | 2076 |
| <b>Synthesis and Properties of Hydroxyapatite-Containing Porous Titania Coating on Titanium by Ultrasonic Shot Peening and Micro-Arc Oxidation</b><br>Z.N. Deng, J.S. Liu, Y. He, S.Q. Wang and J.F. Ma | 2081 |
| <b>The Irradiation Effects of Metal Gold Surface by Intense Pulsed Ion Beam</b><br>D. Wu and Y.J. Du  | 2085 |
| <b>The Study of Aromatization Performance of HZSM-5 Catalyst Deposited Silicon on the Surface</b><br>J. Zhu, Y.F. Ban, M.Z. Sun, B. Zhang and H.Y. Wang   | 2089 |
| <b>Analysis of Selective Absorber Coatings on Thermal Performance of the Solar Flat-Plate Collector</b><br>X.D. Han, S.W. Zhang, C. Chen and Y. Tang  | 2093 |
| <b>Characteristics Evaluation of Coating Film by Thermal Spray in Seawater Solution</b><br>K.M. Moon, M.J. Nam, Y.C. Lee, Y.H. Kim and J.H. Jeong   | 2098 |
| <b>Comparison Research on Mechanical Properties of Stainless Steel after Laser Peened and Ultrasonically Peened</b><br>C. Wang, Z.L. Lai, D. Sun, L.C. Zhou and Z.B. An                                 | 2107 |
| <b>Effect of Electro-Spark Deposition Process Parameter on WC Coating Thickness of H13 Steel Surface</b><br>M.W. Wang, R. Pan, W. Xin, W.Q. Chen, X.J. Zhao and S. Li                                   | 2112 |

|   |      |
|---|------|
| <b>Effects of Carrier Gases on the Microstructures and Properties of Ti Coating Layers Manufactured through the Cold Spraying</b><br>M.J. Lee, H.J. Kim, I.H. Oh and K.A. Lee                     | 2116 |
| <b>Influences of Surface Nanocrystallization Induced by High-Energy Spot Peening on Microstructure and Properties of Magnesium Alloy</b><br>L.W. Tang, J. Sun, J. Zhang, X.B. Ou and Z.M. Zhou    | 2120 |
| <b>Investigations of Wetting Properties of Stainless Steel by Molten Multi-Component Oxides</b><br>J. Wang, N. Matsuda, N. Shinozaki, H. Era and T. Shiraishi                                     | 2126 |
| <b>Polymer Mixtures as Colon Targeted Drug Delivery Systems</b><br>M. Helmis and M. Kumpugdee-Vollrath  | 2131 |
| <b>Structure of Al<sub>2</sub>O<sub>3</sub> Ceramic Coating on Super Alloy Prepared by Cathodic Plasma Electrolytic Oxidation</b><br>Y.L. Wang, M. Wang, Y.M. Qin, X.F. Shi, H.R. Guo and Z.J. He | 2137 |
| <b>Study on the Surface Plasma Hardening Treatment and Anti-Penetration Mechanism of Armor Steel</b><br>K.P. Yu, F. Wang, R.G. Chen and J.J. Zong   | 2141 |
| <b>The Study on Preparation and Apply of Ni-Co-P Alloy Coating</b><br>N.J. Li, M.M. Li and N.W. Li  | 2145 |
| <b>Electroless Nickel-Phosphorus Plating on TiB<sub>2</sub> Powder</b><br>S. Sun, B. Su and W. Shi  | 2149 |
| <b>Phase Evolution and Mechanical Properties of Cr-C Coatings Deposited by Reactive Unbalanced Magnetron Sputtering Process</b><br>Y.S. Yang and W.Y. Huang                                       | 2155 |
| <b>First-Principles Study on Elastic Properties and Electronic Structure of Ti<sub>1-x</sub>Al<sub>x</sub>N</b><br>X. Tan, Z.Y. Xin, X.J. Liu, Q.B. Zhang and Y. Jia                              | 2171 |
| <b>Preparation and Cutting Performance of YT15 Cemented Carbide Tools with Ti (C, N)/Al<sub>2</sub>O<sub>3</sub> Composite Coating</b><br>Y.X. Gao and G.L. Zhang                                 | 2175 |
| <b>Effect of Abrasives on the Lapping Performance of 6H-SiC Single Crystal Wafer</b><br>W. Li, Q.S. Yan, J.B. Lu and J.S. Pan   | 2179 |
| <b>Fabrication and Characterization of Magnetic Polymer ICF Target by the Electroless Plating</b><br>S.B. Cui, Z.Y. Lu and F.W. He  | 2185 |

## Chapter 21: Materials Forming and Manufacturing Processes

|  |      |
|--|------|
| <b>A Study of the Microstructure and Mechanical Properties of C-Si-Mn Hot Rolled Dual Phase Steel</b><br>B.B. Sun and Z.W. Jia               | 2191 |
| <b>Analysis and Research on the Failure Mode of Large Automobile Stamping and Countermeasure</b><br>G.Y. Pan                                 | 2195 |
| <b>Analysis on Structure of Radial-Axial Ring Rolling Experimental Equipment by FEM</b><br>Y.L. Tan, Q. Wang, S.H. Han and F. He             | 2201 |
| <b>Continuous Cooling Transformation Behavior of X70 Pipeline Steel</b><br>H.M. Yang   | 2205 |
| <b>Design and Analysis of the Low-Speed Hydraulic Control System of 3.15MN Forging Press</b><br>Y.B. Li, M.H. Huang, Q. Pan and M. Chen      | 2210 |
| <b>Design of a New Type Flexible Stretch-Forming Machine</b><br>Q.G. Han, M.Z. Li, Q. Zhang, Y.D. Chen and W.Z. Fu                           | 2218 |
| <b>Effect of Lubrications on Quick Plastic Forming Behavior of AZ31 Magnesium Alloy Sheet</b><br>G. Wang, J.L. Wang, Z.P. Zhang and S.J. Yao | 2222 |
| <b>Effects of Strip Thickness Difference on Deviation in Aluminum Hot Rolling</b><br>L.Y. Ma, Y.L. Liu, X.Q. Zhao and C. Liu                 | 2226 |
| <b>Effects of Surface Roughness Microtopography on Formability in Cold Rolled Steel Sheet</b><br>J. Tang                                     | 2232 |

|   |      |
|---|------|
| <b>Forecast of Shrinkage Porosity of Aluminum Wheel Liquid Die Forging in Solidification Process and Process Optimization</b>                     |      |
| H.B. Yang, X.S. Zhao, W.Z. Fan, X.W. Chen and D.Y. Xu   | 2236 |
| <b>Hot Stamping and Blank Designing for a Vehicle Bumper Using Ultra High Strength Steel (UHSS)</b>   |      |
| Z.X. Gui, Y.S. Zhang, H.Q. Li and M.T. Ma   | 2240 |
| <b>Investigation on over-Spray Powder of Spray Formed Al-22Si-5Fe-4Mn-3Cu-1Mg Alloy</b>   |      |
| F.W. Kang, H.C. Li, Y.D. Jia, J.F. Sun and X.H. Zhang   | 2245 |
| <b>Study on Design Parameters of Strip Wound Prestressed Die Based on Fatigue Theory</b>  |      |
| K.J. Chen, Q. Wang and F. He  | 2250 |
| <b>Study on Texture of AZ80 Magnesium Alloy Induced by Multi-Axial Forging</b>  |      |
| Z.Y. Deng, X.G. Chen and J.Z. Cui   | 2254 |
| <b>Study on the Flow Stress of the High-Mn Austenitic Steel during Hot Deformation</b>  |      |
| X. Xu, F.P. Li, C. Feng, P. Wang and S.Y. Song  | 2258 |
| <b>Study on the Parameters of Piercing Die with Finite Element Method</b>   |      |
| Y.X. Yang   | 2265 |
| <b>The Effect of Pre-Strain and Strain Aging on Properties of X100 Line Pipe</b>  |      |
| Q.R. Ma, H.D. Chen, Y.H. Li and H. Li   | 2270 |
| <b>A Review of Liquid Forging Process</b>   |      |
| X.N. Huang, Z.P. Zhong, W. Wang, F.J. Li, D.H. Qiu and C. Peng  | 2275 |
| <b>Development of Intelligent Control of Optimum Parameters in Deep Drawing of Sheet Metal Using Genetic Algorithm and Finite Element Methods</b> |      |
| Y. Bernai-Aguilar, R. Urama, J.R. Marty-Delgado and O. Celestine N.   | 2280 |
| <b>Development of Secondary Controlled Hydraulic Pressure Forming of Sheet Metal for Energy Saving and Re-Utilization:</b>                        |      |
| O. Celestine N., O. Evans Chukwudi and R. Urama   | 2291 |
| <b>Effect of Initial Position of the Counterpunch on T-Shape Hydroforming</b>   |      |
| B.G. Teng and K. Li   | 2302 |
| <b>Effects of Mandrel Structure on Ring Rolling Process for Large-Scale T-Sectioned Ring with Numerical Simulation</b>                            |      |
| P.Z. Zhou, L.W. Zhang, S.D. Gu, H.T. Duan and L.H. Teng   | 2307 |
| <b>Effects of Process Parameters on Wall Thinning Ratio during One Pass Hot Power Backward Spinning for 7075 Cast Aluminium Alloy Tube</b>        |      |
| G.Y. Zhao, R.Y. Zhang and P. Fang   | 2311 |
| <b>FEM-Based Analysis on the Process of Tube Stamping</b>   |      |
| Z.M. Wang, S. Dong and F. Li  | 2315 |
| <b>Finite Element Analysis for 40 MN Die Forging Press</b>  |      |
| W.B. He, P. Zeng and F. Lin   | 2322 |
| <b>Finite Element Analysis of Main Stand of <math>\Phi 140</math> Pipe Rolling Mill and Split Casting</b>   |      |
| M.B. Han and L.F. Sun   | 2327 |
| <b>Flow Stress Models Analysis for Metal Powder Forming Simulation</b>  |      |
| M.J. Liu, H.P. Chen and J.X. Jiang  | 2331 |
| <b>Investigation of Effective Parameters of Spring-Back in CK67 Steel Sheet Metal Using Finite Element Method</b>                                 |      |
| S. Soleimani Darinsoo, H. Zoghi Shal and R. Khamedi   | 2336 |
| <b>Parameter Optimization of the Injection Molding Process for a LED Lighting Lens Using Soft Computing</b>                                       |      |
| W.C. Chen, L.Y. Wang, C.C. Huang and T.T. Lai   | 2344 |
| <b>Plastic Instability Criterion of Radial Ring Rolling</b>   |      |
| Z.H. Xu, D. Zhao and Q. Wang  | 2352 |
| <b>Pulse Current Auxiliary Tensile and Bulging of Light Metal Alloy</b>   |      |
| J.Y. Liu, K.F. Zhang and S.S. Jiang   | 2356 |
| <b>Rolling Force Prediction System of Cold Rolling Process Based on BP Neural Network</b>   |      |
| W. Teng and G.M. Wang   | 2361 |
| <b>Use of Acoustic Energy in Sand Casting of Aluminium Alloys</b>   |      |
| H. Puga, J. Barbosa and J. Oliveira   | 2366 |
| <b>Study on Conventional Domed Bursting Disc Material and Burst Pressure Test</b>   |      |
| W.P. Xu and Y.T. Liu  | 2371 |

|  |      |
|--|------|
| <b>Numerical Simulation of Stress-Strain of AZ31 Mg Alloy Profile during Warm Tension-Rotation Bending Process</b> |      |
| H. Xiao and L.B. Wu  | 2379 |
| <b>Small Module Involute Spline Processing with Position Requirements</b>  |      |
| B.G. Zhang   | 2383 |
| <b>Research on Key Processing Technology of Nuclear Power Tapered Cylinder Forging</b>                             |      |
| S.M. Nie, Z.Q. Yu, D.N. Meng, R.S. Qi, X.G. Liu and M. Jin   | 2387 |

## Chapter 22: Materials Machining

|  |      |
|--|------|
| <b>A Theoretical Model of Grinding Force and its Simulation</b>  |      |
| D.L. Qin, F. Wang, F.J. Xi and Z.F. Liu  | 2395 |
| <b>An Experimental Study of Cutting Forces in Ball-End Milling of AISI H13</b>   |      |
| T.C. Ding  | 2403 |
| <b>Analysis on Milling Stability Performed under the Conditions of Positive and Negative Process Stiffness</b>         |      |
| T.C. Hsiao, C.Y. Huang and J.J. Junz Wang  | 2408 |
| <b>Chip Formation Simulation in FE Modeling for Machining FRP Composite</b>  |      |
| Y.L. He, H.Y. Ma and J.Y. Wang   | 2422 |
| <b>Cutting Force Modeling and Prediction in End Milling Including Flank Wear</b>                                       |      |
| J. Wen, F.Y. Peng, S. Lin, R. Yan and Y.Z. Liu   | 2427 |
| <b>Effect of Microstructure on Cutting Force and Chip Formation during Machining of Ti-6Al-4V Alloy</b>                |      |
| S.J. Sun, M. Brandt and J.P.T. Mo  | 2437 |
| <b>Experiment on Surface Roughness and Acoustic Emission Signal in Infeed Period of Cylindrical Plunge Grinding</b>    |      |
| H.L. Li, H.Y. Cao and C. Jiang   | 2442 |
| <b>Experimental Study on Hardness of Titanium Alloy Ti-1023 by Milling</b>   |      |
| H.C. Yang, Z.T. Chen and L.K. Jiang  | 2446 |
| <b>Grinding Parameters Optimization of Stainless Steel Surface Based on Grey Relational Analysis</b>                   |      |
| Y.L. Chi, H.L. Li, H.Y. Cao and X.K. Lin   | 2450 |
| <b>Machining Simulation of Equal Base Circle Bevel Gear Using Disc Cutter</b>  |      |
| B. Wang, X.Z. Deng, Y.L. Zhao and B. Zhang   | 2456 |
| <b>Math Modules Establish for BUR Edge Chamfer and its Grinding Process</b>  |      |
| Y. Wang, X.X. Ning and H.P. Jing   | 2460 |
| <b>Modeling and Analysis of Machining Force in Elliptical Vibration Cutting</b>  |      |
| J.Q. Lin, J.H. Liu, X.P. Gao and S.Q. Wang   | 2464 |
| <b>Modeling of Force on Axial Power Ultrasonic Honing</b>  |      |
| Z. Liu, X.J. Zhu, J.Q. Wang and Y.P. Shao  | 2470 |
| <b>Research of Bearing Crown Roller-Raceway by Non-Uniform Interelectrode Gap Electrochemical Mechanical Machining</b> |      |
| Z.F. Wei, X.H. Zheng and B. Tao  | 2475 |
| <b>Research on the Relation between Cutting Parameters and Axial Cutting Force in Helical Milling Process</b>          |      |
| H.Y. Wang and X.D. Qin   | 2480 |
| <b>Research on the Rock Breaking by Double Disc Cutter Test-Bed</b>  |      |
| P. Zhou, C. Wang, W.X. Gao and Y.H. Wu   | 2484 |
| <b>Simulation on Material Removal during Reciprocating Traveling WEDM of Insulating Ceramics</b>                       |      |
| Y.F. Guo, P.J. Hou, L.X. Sun, L. Wang and Z.F. Li  | 2490 |
| <b>Static and Modal Characteristic Analysis of a Horizontal Machining Center</b>                                       |      |
| G.Q. Liang, M. Lin and T.T. Guo  | 2496 |
| <b>Study on Machinability of Pre-Hardened Plastic Mould Steel</b>  |      |
| Y.A. Min, Y.P. Yang, Z. Zhang, Y. Wu and X.C. Wu   | 2501 |
| <b>The Analysis of Static and Dynamic Characteristic in Grinding Head of Roller Machine</b>                            |      |
| J.L. Cao and Y. Luo  | 2509 |



|  |      |
|--|------|
| <b>The Influence of Variable-Speed Waveforms on Vibration Suppression in Time-Varying Speed Cutting</b>                                  |      |
| J. Cong, Y. Wang and W.N. Yu   | 2514 |
| <b>Drilling Simulation of Carbon Fiber Reinforced Plastic Composites Based on Finite Element Method</b>                                  |      |
| Z.H. Sha, F. Wang and S.F. Zhang   | 2519 |
| <b>Experimental Investigation of Effect of Gear Milling Parameters of Al-B<sub>4</sub>C Composite Gears on Surface Roughness</b>         |      |
| D.S.R. Smart, P. Varghese and L.J. George  | 2523 |
| <b>Investigation on Delamination Factor in Drilling Medium Density Fiberboards with Variable Feed Pressure Using Multi-Spindle Drill</b> |      |
| K. Wang, C. Wang and M. Gao  | 2529 |
| <b>Parameter Recognition and Optimization of Residual Stress Prediction Model Based on Genetic Algorithm</b>                             |      |
| H.T. Liu, Y.Z. Sun and D.B. Shan   | 2535 |
| <b>Prediction of Surface Roughness on CNC Turning Based on Monitoring of Cutting Force and Cutting Temperature</b>                       |      |
| S. Tangjitsitcharoen   | 2540 |
| <b>Study on the Ultrasonic Characteristics in the Contact Interface under Ultrasonic Cutting</b>   |      |
| Z. Ming, Z. Liu and J. Feng  | 2550 |
| <b>The Effect of Tool Geometrical Parameters on Cutting Temperature Based on Deform-3D</b>   |      |
| H.J. Zhang and Z.T. Tang   | 2554 |
| <b>The Nano-Cutting Mechanism Research of Polysilicon Based on Molecular Dynamics</b>  |      |
| Y. Zhu, S.H. Qi, Z. Xiang and L.L. Xie   | 2559 |

## Chapter 23: Welding & Joining

|   |      |
|---|------|
| <b>An Investigation on Vacuum Brazing of Dissimilar Nonferrous Metals of Cu and Al</b>                        |      |
| W.Y. Yu, T.D. Xia, W.W. Ding, X.J. Wang and W.J. Zhao   | 2565 |
| <b>Effect of Magnetic Field Current on Microstructure and Properties of AZ91 Magnesium Alloy Welded Joint</b> |      |
| Y.H. Su, J.L. Lin and Z.P. Kan  | 2570 |
| <b>Effects of Welding Heat Input on 22MnB5 Steel with Hot-Dipping Al Coating</b>                              |      |
| C.Y. Wang, L. Li, H.R. Li, C.L. Qin and H.Y. Zhao   | 2574 |
| <b>Influence of Reflow Soldering Process Parameters on the Lead-Free Reflow Profile</b>                       |      |
| W.L. Liang, X.D. Guan and P. Zhao   | 2578 |
| <b>Life-Cycle Energy Analysis as a Method for Welding Joint Design</b>  |      |
| W.Y. Yu, T.D. Xia, W.W. Ding, X.J. Wang and W.J. Zhao   | 2583 |
| <b>Modeling and Simulation on Temperature Control System for Hot Pressure Welding</b>                         |      |
| B. Xie, F. Hu and S.M. Chen   | 2589 |
| <b>Weld Seam Deviation Detection Base on Laser Welding Pool's Centroid</b>                                    |      |
| R.H. Zhen   | 2594 |
| <b>Analysis of Organizations of Brazed Seam 5052 Al Alloy Contact Reactive Brazing</b>                        |      |
| F.F. Tan and K. Du  | 2598 |
| <b>Bayesian Probabilistic Approach to FE Model Updating of Vehicle Typical Spot Weld Structure</b>            |      |
| C.Z. Yao, H.Y. Wang and Q. Rui  | 2601 |
| <b>Experimental Study of Effect of Adhesives on Strength of Composites Adhesive Joints</b>                    |      |
| Y.H. Yang   | 2608 |
| <b>Fracture Behavior of High-Frequency Welded Joints of GH4169 Alloy</b>                                      |      |
| X.X. Duan and Y.H. Zhang  | 2612 |
| <b>Mechanism Research on Residual Stress's Elimination of Aluminum Alloy Welding by Ultrasonic</b>            |      |
| G.J. Cui, T.T. Lv and X. Zheng  | 2616 |
| <b>Modeling and Analysis of Underwater Wet Weld Process Based on Regression Method</b>                        |      |
| B. Chen and J.C. Feng   | 2621 |
| <b>Numerical Simulation Research of Tailor-Welded Blanks</b>  |      |
| W.G. Guo and Q.L. Jin   | 2625 |

|   |      |
|---|------|
| <b>Orthogonal Experiment of Resistance Microwelding of Insulated Copper Wire and Phosphor Bronze Sheet</b><br>J. Qi   | 2631 |
| <b>Progressive Failure Analysis of Adhesively Bonded Laminates Joints with Spew Fillets</b><br>Y.H. Yang  | 2635 |
| <b>Properties Effect of 16MnR Steel Weld Joint by Different Welding Methods</b><br>L. Guo, T.H. Zhang, R.P. Xu and H. He  | 2639 |
| <b>Research on Welded Pipe and Tube Pass Design Virtual Methods</b><br>G.C. Li  | 2643 |
| <b>The Friction Welding Characteristic Analysis of the Al 7075-T6 According to the Spindle Speed and Upset Pressure</b><br>I.T. Lee, H.S. Kim, C.G. Park, D.P. Hong and H.Y. Kang | 2647 |
| <b>The Temperature and Residual Stress Distributions of Butt Weld Pass on Nickel Alloy 690 Plate</b><br>C.H. Yin, C.M. Hsu and J.H. Kuang   | 2651 |
| <b>The Welding Track Planning and Motion Control of T-Type Tube Autowelding Machine</b><br>J.P. Zhou, X. Yi, Y. Xu, C.Y. Zhang and C.H. Liang                                     | 2655 |
| <b>Three-Dimensional Numerical Simulation of Temperature Field and Force Field of T-Type Turbe during Welding</b><br>J.P. Zhou, X.F. Zhang, H.S. Liu, J.Y. Gao and Y. Xu          | 2659 |
| <b>Vacuum Brazing of Copper Tubes Using Ag-Cu Filler</b><br>R.F. Li, Z.X. Shi, K. Qi and M.F. Wu  | 2664 |
| <b>Influence of Fluctuation Frequency on Stress Corrosion Cracking of X70 Pipeline Steel Welding Joint</b><br>Q.L. Sun, W.W. Shao, X.G. Wang and C.B. Wang                        | 2668 |
| <b>The Characteristics of Weld Metal Zone Welded with Various Filler Metals</b><br>K.M. Moon, M.J. Nam, Y.C. Lee, Y.H. Kim and J.H. Jeong   | 2673 |

## Chapter 23: Welding & Joining

|  |      |
|--|------|
| <b>A Method Based on the Morphology of Lead-Free Solder Powder Adhesive Particle Segmentation</b><br>H.M. Wang, L. Lu, X.L. Liu and F. Gao | 2681 |
| <b>Research for Viscoplastic Behaviors of SAC405 Pb-Free Solder</b><br>Y.M. Li, T.Y. Zhao, J. Liu and B.Z. Huang                           | 2686 |

## Chapter 24: CAD/CAE/CAM

|   |      |
|---|------|
| <b>A New Method for Minimizing Cogging Torque in Permanent Magnet Machines Using Genetic Algorithm</b><br>J.S. Shangguan and C.Z. Fan         | 2693 |
| <b>Ab Initio Molecular Dynamics Simulations of Cu under Vacuum and 473~1573K</b><br>S.H. Sun, X.M. Chen, F.X. Zhang and B. Yang               | 2699 |
| <b>Application of Interactive Orthogonal Design on the Aerodynamic Drag Optimization of Hatchback Car</b><br>H. Yu, H. Zhu and Z.G. Yang      | 2703 |
| <b>Application of Reverse Engineering for Redesigning and Manufacturing of a Printer Spare Part</b><br>I. Buranský, L. Morovič and J. Peterka | 2708 |
| <b>Computerized Numerical Control (CNC) Machining Engraving Processing of Surface Based on Master CAM</b><br>S.W. Huang                       | 2713 |
| <b>Design and Analysis of the Spiral Staircase in Large Steel Structure</b><br>X.F. Ding, B.N. Qu and X. Zhao                                 | 2718 |
| <b>Design of Upswept Aft-Body of Civil Transport Based on CFD</b><br>M.Q. Yang, D.L. Ma, Y.F. Liu and W.Y. Li                                 | 2722 |

|   |      |
|---|------|
| <b>Discrete Element Method Simulation of Mesomechanics of Railway Ballast during Tamping Process</b>  |      |
| T.Y. Zhou, B. Hu, B. Yan and P. Xu  | 2726 |
| <b>Experimental and Numerical Study of Railway Ballast Compactness during Tamping Process</b>   |      |
| T.Y. Zhou, B. Hu, B. Yan and J.F. Sun   | 2730 |
| <b>Finite Element Analysis of Light Cargo Van Frame</b>   |      |
| J. Zhou, L.Q. Min and Z.S. Yang   | 2734 |
| <b>Finite Element Analysis of Sealing Structures for SF6 Gas Insulated Switchgear</b>   |      |
| C. Li, F. Ying and H. Zhao  | 2738 |
| <b>Hand Sketching in 3D Computer Animation Model Rendering and Editing</b>  |      |
| Z.F. Zhao   | 2742 |
| <b>Mohr Strength Theory in Simulation Stress Analysis</b>   |      |
| Q. Wang, Z.J. Li, J.X. Zhang, Q.F. Xie and P. Tang  | 2746 |
| <b>Numerical Simulation and Optimization of Steel Pipe Cathodic Protection under the Condition of 3.5% Brine</b>  |      |
| M. Zhang, J. Zhao, L.L. Zou and G. Wang   | 2751 |
| <b>Point-Based CAD/CAM Geometric Model Design</b>   |      |
| F.J. Wang   | 2757 |
| <b>Simulation Calculation of the Braking Performance of Portal Cranes Based on ADAMS</b>  |      |
| J.B. Hu, H. Zou, Y.G. Feng, H. Jin and X.L. Wu  | 2762 |
| <b>Surface Extension in Smoothing of Class a Surfaces for Auto-Body</b>   |      |
| J.C. Xu, P.P. Fan, Z.X. Song and W.C. Zheng   | 2767 |
| <b>The Optimal Design of Injection Mold Gate Based on CAE</b>   |      |
| J.W. Tang   | 2772 |
| <b>A New Method to Handle Temporal Planning in Flexible Graphplan Framework</b>   |      |
| J.Y. Ren, L. Zhang, Z. Xiong and L.J. Qi  | 2776 |
| <b>A Universal Feature Definition Frame for 3-D CAD Model Conversion</b>  |      |
| C.L. Sun, D.Y. Ning, W. Xiong and H.T. Wang   | 2781 |
| <b>Combination Regression and Neural Network for Short Term Load Forecasting</b>  |      |
| Q.M. Chen, X.Z. Xu and N. Zeng  | 2787 |
| <b>Four - Wheel Steering Vehicle Modeling and Simulation Based on ADAMS</b>   |      |
| W.T. Wang   | 2796 |
| <b>Multi-Dimensional Analysis of NO<sub>x</sub> and Soot Formation in A Diesel-Fueled Hydraulic Free Piston Engine</b>  |      |
| Y.X. Yu, Z.C. Yuan, J.Y. Ma and S.Y. Li   | 2800 |
| <b>New Downhole Intelligent Throttling System Based on the Poppet Valve</b>   |      |
| C.Y. Deng, M.G. He, X.F. Zhao and G.F. Yin  | 2805 |
| <b>Numerical Analysis of Flat Circular Parachutes Inflation Process</b>   |      |
| Y.X. Yu, J.L. Tian and Y. Chen  | 2813 |
| <b>Point Cloud Data Preprocessing Based on the Geomagic</b>   |      |
| F.C. Xue  | 2817 |
| <b>Research on Three-Dimensional Topology Optimization for the Bed of NC Gear Shaper</b>  |      |
| Q.H. Tian, R. Tao and Y.X. Du   | 2821 |
| <b>The Development and Simulation of the 3D FEM Software ---- Alpha System</b>  |      |
| M.R. Xu, B.W. Wang, M. Li and J.X. Wang   | 2826 |
| <b>The Reliability Evaluation of Threaded Connections in Challenging Drilling by Three-Dimensional Finite Element Analysis</b>  |      |
| F. Chen, Q.F. Di, W.C. Wang, W.P. Zhu, M.J. Wang and Z.J. Shen  | 2831 |
| <b>The Research of Deformation Compensation of the Unloading Mechanism of the Beam for XK-2535 Large-Scale CNC Gantry Milling Machine and Engineering Application</b> |      |
| S.S. Chen, X. Xu, Z.P. Hua and C. Dai   | 2840 |
| <b>Development of CAD Module for Gating System of Iron Castings Based on Sinovation</b>   |      |
| H.L. Zheng, X.X. Yuan, L. Li and X.L. Tian  | 2845 |
| <b>Construction Method of Tool Path Based on Arc-Cell</b>   |      |
| D.Z. Huang, Q.C. Zhao and T.L. Yang   | 2849 |
| <b>A Parting Surface Design of Multi-Cavity Mold Based on Pro/E Surface Technique</b>   |      |
| J.G. Huang and C.Y. Li  | 2855 |

## Chapter 25: Modeling, Analysis and Simulation of Manufacturing Processes

|   |      |
|---|------|
| <b>Air Flow Field and Fiber Motion in a Swirl Die Melt-Blowing Process</b><br>S. Xie, Y.S. Zheng and Y.C. Zeng  | 2861 |
| <b>An Identification Method for Joint Parameters Based on Finite Element</b><br>Z.Q. Chen, Y.F. Wang, Y.S. Zhu, Z.H. Xu and K.P. Song   | 2866 |
| <b>Analysis on micro-/poly-Crystalline SiGe Alloy Solar Cells</b><br>Q.B. Zhang, W.S. Wei and F. Shan   | 2872 |
| <b>Dynamics Influences Discussion of Robot MiniQuad-II for Construction Member Structure Change Based on ADAMS</b><br>L.W. Wang, C.P. Wang, X.J. Wang and X.Q. Mu                                   | 2881 |
| <b>Effects of Structural Parameters on Nanofiber from a Multihole Electrospinning Setup</b><br>Y.S. Zheng, S. Xie and Y.C. Zeng   | 2886 |
| <b>Numerical Simulation Analysis on Repairing Hole of UAV Wing</b><br>G.D. Jin, L.B. Lu, L.X. Gu and J. Liang   | 2891 |
| <b>Optimal Production LineLayout Model Based on Integer Programming</b><br>Y. Zhao, X.Y. Pan, C.C. Li, G.H. Yao, J. Wu, X. Fu, D. Lai, D. Li and Q.W. Zhang   | 2896 |
| <b>Research and Application of the Structural Optimization Design Technique for the Large and Efficient Band Sawing Machine</b><br>G.J. Chen, Y.P. Gong, T.T. Liu, H.P. Chen and J. Ni              | 2901 |
| <b>Research of Modeling and Simulation of Aviation Ignition Equipment</b><br>K. Song, J.B. Liao and Q. Yang   | 2906 |
| <b>Simulation of the Nozzle Electro-Hydraulic Servo Valve with ITI-SimulationX</b><br>E.Q. Jiang, S.H. Wang, J.K. Du, X.Y. Xu and W.Y. Li   | 2912 |
| <b>Simulation on the Hydraulic System of a Constant Tension Waves Compensation Winch</b><br>N. Li, S.Y. Zhang and A.D. Ren  | 2918 |
| <b>Study on the Formability Rules with Precise Die Face for the Inner Clutch Shell of Automobile</b><br>B.G. Mebrahtu, Y.J. Cai and Q. Yu   | 2923 |
| <b>Study on the Pressure Distribution on Solid-Plug Conveying of Centrifugal Extruder</b><br>J. Zhao, S.J. Wang and X.R. Lv   | 2928 |
| <b>The FEA and Optimal Design of the Loader Based on Virtual Prototyping</b><br>Y. Xu   | 2933 |
| <b>The Micro-Variation Principle of Mating Constraints and its Application to Simulation of Cumulative Deviations for Mechanical Assemblies</b><br>B. Wang, J.L. Xu, G.L. Zheng and L.H. Duan       | 2938 |
| <b>The Spent Fuel Pool Analysis of Chinshan Nuclear Power Plant by Using TRACE/FRAPCON-3.4</b><br>J.R. Wang, H.T. Lin, W.W. Li, H.C. Chen and C.K. Shih   | 2947 |
| <b>The Study of Mechanism Analysis and Dynamical Simulation Based on Ultrasound Enhanced Supercritical and Subcritical CO<sub>2</sub> Dissolution</b><br>B. Zhang, W.W. Liu, M.Z. Li and H.C. Zhang | 2951 |
| <b>Design and Simulation of Rinsing Equipment of Cable Rolling Wire Rope</b><br>P. Wang, H. Wang and J.Y. Jiang   | 2957 |
| <b>Design of Compressed Air Dehumidifying Equipment for Wire Rope and Simulation of Air Knife Flow Field</b><br>P.H. Guo, W.H. Cui and H. Wang  | 2961 |
| <b>Effect of High Frequency Electromagnetic Fields on Liquid Steel in Soft-Contact Mold</b><br>X.J. Wang, R. Liu and L.G. Zhu   | 2965 |
| <b>Effect of Insulators on the Power Consumption and the Oxygen Content of Si Ingots in Czochralski Growth</b><br>J.S. Shin, W.K. Choi and K.Y. Kim   | 2969 |
| <b>Feasibility Analysis and Simulation of Minitype Combination Balance</b><br>Y. Fan, Y.X. Wang and Z.C. Wang   | 2973 |
| <b>FEM Based Numerical Simulation of Delta Parallel Mechanism</b><br>J.Z. Zhang, X.P. Xie, C.J. Li, Y.Y. Xin and Z.M. He  | 2978 |

|  |      |
|--|------|
| <b>Finite Element Analysis and Experimental Study of an Electromagnetic Shell Part with Flow Control Forming</b>             |      |
| Z.W. Huang, Y.Y. Wan, Y.B. Wang, L.C. Che, C.L. Liu and G. Chen  | 2982 |
| <b>Finite Element Analysis of Frame on ZXZ90 Towing Machine for Cable</b>  |      |
| H. Wang, J.N. Nie, P. Wang and P.H. Guo  | 2990 |
| <b>Optimization Design for the Longitudinal Structure of LED Light Guide Plate Using Soft Computing</b>                      |      |
| W.C. Chen, P.H. Liou and B.J. Chen   | 2994 |
| <b>Partial Least Squares Regression Analysis of Thermal Distortion Behavior for Linear Motor Drive Feed System</b>           |      |
| X.K. Lin and Q.Q. Wu   | 3001 |
| <b>Single-Machine Scheduling to Minimize Makespan with Deterioration Jobs and Multi-Maintenance Activities</b>               |      |
| C.J. Hsu and H.C. Chen   | 3007 |
| <b>Solute Distribution Ahead of Interface during Heteroepitaxial Growth</b>  |      |
| W.J. Yao, Z.J. Jin, N. Wang and J.Y. Lee   | 3014 |
| <b>The Effect of Damping Block Design on Stability of Ploymer Coextrusion Process</b>  |      |
| H.R. Zhang, X.F. Liu and B. Zhang  | 3018 |
| <b>The Modal Analysis for the Third Type of Internal Gear Motor</b>  |      |
| J. Zhang, C.R. Tang, H.M. Tang, X.H. Li, M.M. Niu, Q.Y. Cai, X.W. Zhao and B. Zhang  | 3023 |
| <b>The Simulation Study of the Influence of Surface Error on Optical Properties for Optical Part</b>                         |      |
| T.R. Liu, X. Qiu, H. Li, Y.L. Li, C. Xu, Y. Hu and X.Q. Zhou   | 3027 |
| <b>Theoretical Analysis on Manufacturing Hypoid Left-Hand Gears by Generating-Line Method</b>                                |      |
| L.J. Yu, Z.J. Yang and X.P. Li   | 3032 |
| <b>Co-Simulation of Composite ABS Control for In-Wheel Motor Drive Electric Vehicle Based on Threshold Control Algorithm</b> |      |
| J.H. Li, C.X. Song and L.Q. Jin  | 3036 |
| <b>Design and Analysis of a CFRP Drive Shaft</b>   |      |
| G.L. Zhang, Z.D. Zhou, J.G. Zhang, Y.F. Hu and J.W. Gong   | 3042 |
| <b>Research on Vibration and Sound Radiation from Submarine Functionally Graded Material Nonpressure Cylindrical Shell</b>   |      |
| Y.B. Zhang, C.Y. Ren and X. Zhu  | 3046 |
| <b>Numerical Investigation for Fracture Saturation in Multilayer Sedimentary Rock in Unsymmetrical Case</b>                  |      |
| F.S. Han and L. Song   | 3050 |
| <b>Numerical Simulation for Rock Fracturing Process under Action of Disc Cutter</b>  |      |
| L.J. Cao, S.J. Li and Z.C. Shangguan   | 3054 |
| <b>The Preventing Coal and Gas Outburst Technology of Middle Distance and Low Permeability and Upper Protective Layer</b>    |      |
| G.W. Dong  | 3059 |
| <b>The Roof Broken Mechanism of Fully Mechanized Coal Face with Super Thick and Loose Layer</b>                              |      |
| G.W. Dong  | 3068 |
| <b>Research and Prediction of Yellow Soil Moisture Content in Guizhou Province Based on ARIMA Model</b>                      |      |
| M. Liu and Z. He   | 3076 |
| <b>Energy Analysis and Optimization of Methyl Chlorosilane Separation</b>  |      |
| J.H. Duan and X. Mei   | 3082 |
| <b>The Optimization of CO<sub>2</sub> Huff and Puff Well Location in Ultra-Low Permeability Reservoir</b>                    |      |
| D.F. Zhao, X.W. Liao, S.P. Wang, D.D. Yin and B.B. Shang   | 3086 |
| <b>Prediction of the Flow, Reaction and Heat Transfer for Glass Furnace Firing Petroleum Coke</b>                            |      |
| C.S. Hu, Y.B. Wang, P. Wang and J.Q. Bi  | 3090 |
| <b>A Coke Quality Prediction Model Based on Support Vector Machine</b>   |      |
| H.J. Chen and J.F. Bai   | 3097 |

|  |      |
|--|------|
| <b>Research on Materials Corrosion Failure Model of Liquefied Natural Gas (LNG) Cylinder for Vehicle</b><br>Y. Zhong and Y. Fei  | 3102 |
| <b>Simulation Studies on the Influence of Impact Velocity on the PELE Penetrated and Broken Reinforced Concrete</b><br>X.J. Ye, Z.H. Du, C.H. Hu, C.J. Song and X. Sheng | 3108 |
| <b>The Failure Finite Element Analysis of Pump Collision with Valve in the Oil Well Pump</b><br>S.L. Wang, Y. Zhang, N.Y. Bai and Y.M. Cai                               | 3112 |
| <b>The Main Structure Design and Motion Simulation of Spreaders Based on Virtual Prototype Technology</b><br>P. Shang, Y.Z. Hu, X.Y. Yan and Y.M. Guan                   | 3116 |
| <b>The Modal Analysis of the Main Steel Structure of Bucket Wheel Stacker Reclaimer</b><br>P. Shang, Y.Z. Hu, L.H. He and Y.M. Guan                                      | 3121 |
| <b>Distribution of Stray Current in the Buried Metallic Pipeline Based on Inducted Electric Field</b><br>C.H. Li, S.T. Zhang and W.P. Li                                 | 3125 |
| <b>Design of Terraced Spinneret Based on Simulation of Electric Field Distribution in Electrospinning</b><br>G.J. Jiang and S. Zhang                                     | 3132 |
| <b>Micro Injection Molding and Strength Check of Polymer Micro-Needle</b><br>L. Xue, G. Zhou, Y.J. Zhang, J. Zhuang and D.M. Wu  | 3136 |
| <b>Simulation Analysis on Height Change of 6010 Aluminum Plate Limit Drawing under Different Process Parameters</b><br>J.P. Li   | 3141 |
| <b>Optimization and Improvement of Pile and Pull Coefficient Mathematical Model for Trapezoidal Stainless Steel Sieve Bar</b><br>L. Pan, Y.Q. Wang, J.J. Wang and B. Sun | 3145 |
| <b>Virtual Processing of Fish Fillets</b><br>S.C. Fok and F.L. Tan   | 3149 |
| <b>Integrated Kinematics Optimization and Strength Analysis for a Wheel Loader Boom Mechanism</b><br>N. Chen, J.N. Yang and Y.H. Liu                                     | 3157 |
| <b>Numerical Simulation on Thermal Field in the Fluidized Bed with Internal Heating Plates</b><br>J.H. Duan and Q. Wang  | 3162 |
| <b>Modeling and Analysis of the Scavenging System for a Two-Stroke Cycle Hydraulic Free Piston Engine</b><br>Y.X. Yu, Z.C. Yuan, J.Y. Ma and P. Li                       | 3166 |
| <b>The Effect and Analysis of the Crankshaft Journal Fillet Rolling for Runout</b><br>P.F. Zhao and Y.W. Zhang   | 3170 |
| <b>The Study of EDG GH3536 Surface Roughness Base on the Artificial Neural Network Modeling</b><br>J. Gao, D. Wang and Y. Sun  | 3175 |
| <b>The Damage Evolution of the Flange Repaired Reinforcement Laminates</b><br>Y. Wang, X.X. Chen and Z.Q. Jiang  | 3180 |
| <b>The Research on Dynamic Simulation of Rods and Cones Type Docking Mechanism</b><br>J. Zhang, C.J. Liu and Y.T. Yu   | 3185 |
| <b>Reservoir Modeling and Numerical Simulation Controlled by Flow Units</b><br>Y.C. Xue and L.S. Cheng   | 3190 |
| <b>A New Operational Pattern Optimization Method and Its Application in Nonferrous Metallurgy</b><br>T.B. Wu, Y. Cheng, H.Q. Zhu, Y.G. Li and Z.K. Hu                    | 3194 |
| <b>Spectral Element Approximation for the Eigenvalue Problem of Hydrogen Atoms Electronic Structure</b><br>J.Y. Han and Y.D. Yang  | 3199 |

## **Chapter 26: High-Speed/Precision Machining, Inspection and Control Technologies**

|  |      |
|--|------|
| <b>A Template-Matching-Based Fast Algorithm for PCB Components Detection</b><br>H.M. Yin   | 3205 |
| <b>Abrasive-Free Polishing of Hard Disk Substrate with <math>\text{H}_2\text{O}_2</math>-<math>\text{K}_2\text{S}_2\text{O}_8</math>-<math>\text{NaHSO}_3</math> Slurry</b><br>W.T. Zhang and H. Lei | 3209 |
| <b>Aspherical Surface Contact Detection Error Analysis</b><br>H.H. Xu, Y. Zhang, X.G. Xia and Z.W. Wang  | 3213 |
| <b>Deep-Hole Precision Honing of Difficult-to-Cut Materials</b><br>X.S. Xu, Z.Y. Sun, Z.F. Liu and H. Peng   | 3218 |
| <b>Effect of <math>\text{K}_2\text{S}_2\text{O}_8</math> on Material Removal Rate in Abrasive-Free Polishing of Hard Disk Substrate</b><br>R. Zhao and H. Lei  | 3222 |
| <b>Electrochemical Deburring of Miniature Holes</b><br>X.H. Zheng, Z.F. Wei and Z.Y. Yu  | 3226 |
| <b>Numerical Analysis of the Ultrasonic Honing Chatter Based on the Stribeck Model</b><br>J.Q. Wang and X.J. Zhu   | 3231 |
| <b>Quantitative Analysis of Lateral Setting Error in Two-Point Method</b><br>G.Q. Ding, X. Chen, H. Wang, L.H. Lei and Y. Li   | 3235 |
| <b>Simulation Analysis of Thermodynamics on the Belt Spindle of the Machining Center</b><br>Q. He, A.L. Li, Y. Zhang, Y. Jun and X.S. Li   | 3240 |
| <b>The Effect of Geometric Error on Machining Accuracy for Machining Center</b><br>G.Q. Liang, A.R. Zhang and T.T. Guo   | 3244 |
| <b>Virtual Gear Measurement Center and its Application</b><br>H. Chen and F. Wang  | 3249 |
| <b>A Novel Method for Kinematic Optimization of Camshaft Non-Circular Grinding</b><br>J. Li, W. Zhang, N.Y. Shen and X.L. Wang   | 3253 |
| <b>Comprehensive Test of Electric Spindle Based on Thermal Stress</b><br>Z.H. Sun, W.G. Gao and H. Xiao  | 3258 |
| <b>Estimation of the Time Constant of Precision Plunge Grinding in Dwell Period Based on Acoustic Emission Measurement</b><br>C. Jiang, D.B. Guo and H.L. Li   | 3262 |
| <b>Experimental Investigation on Thermal Characteristics of Hollow Ball Screw in Different Working Conditions</b><br>Y. Wang, W.G. Gao, D.W. Zhang and Z.H. Sun                                      | 3266 |
| <b>Inflection Points Processing of Continuous Tiny Line Segments for CNC System High-Speed Machining</b><br>K.F. Wu, T.Y. Wang, Q.J. Liu, F.X. Lin and R.Y. Liang                                    | 3271 |
| <b>Research on the Influence of Harmonics on High-Speed Permanent Magnet Motor</b><br>H. Cui and Y.Q. Gao  | 3275 |
| <b>Study on Spindle Dynamic Errors of Domestic NC Machine Tools</b><br>J. Qiu  | 3279 |
| <b>Study on Ultrasonic Cavitation Field of Power Ultrasonic Honing</b><br>C. Guo, X.J. Zhu and G.D. Liu  | 3284 |
| <b>Research and Application of Dynamic Secondary Cooling Control Method for Slab Caster of CISDI</b><br>S.G. Wang, K. Feng, Z.W. Han, Y.W. Kong and J.F. Cao   | 3289 |
| <b>The Improvement of Laminar Cooling System for Hot Rolled Strip Base on Rolling Process</b><br>H.F. Wang, X.G. Ren and Y. Rong   | 3295 |
| <b>Experimental Research on Acoustic Parameters and Saturation of Gas Hydrate-Bearing Sediments</b><br>J. Zhang, Y.G. Ye and G.W. Hu   | 3299 |
| <b>Study on Flaw Detection in Welding Zone of Diamond Saw Blade</b><br>M. Zhao, R.B. Gai and J. Zhang  | 3303 |
| <b>Study on Reaming High-Precision Thin Hole in Hardened Steel by Ultrasonic Vibration Reamer</b><br>J.Z. Zhang, N.C. Zhang and Y. Zhang   | 3307 |
| <b>Development of an Automatic Inspection System for Manufacture of Plastic-Container Pump Assemblies</b><br>S.W. Hwang, J.M. Kim, J.Y. Kim, J.M. Jun and D.S. Hong                                  | 3312 |

|   |      |
|---|------|
| <b>Finite Element Analysis of Contact between Laying Head Pipe and High-Speed Wire Rod</b><br>C. Liu, Y.L. Liu, L.Y. Ma and P. Yuan | 3316 |
| <b>Research on the Normal Error of Large Aspheric Mirror Employed in Bonnet Polishing</b><br>W. Yang and C.J. Wang                  | 3321 |

## Chapter 27: Laser Processing Technology

|  |      |
|--|------|
| <b>Dry Sliding Wear Behavior of Laser Clad WC/NiCrBSi Metal Matrix Composite Coatings</b><br>J.X. Yang and X.H. Miao                                     | 3327 |
| <b>Numerical Simulation of Feeding Powder Laser Cladding Temperature Field Based on ANSYS</b><br>C.F. Song and M.D. Wang                                 | 3334 |
| <b>Optimizing BP Networks by Means of Genetic Algorithms in Quality of Laser Milling</b><br>Z.M. Xu, Z.H. Hong, G. Yang and Q.A. Wang                    | 3338 |
| <b>The Influence of Mixing Enthalpy on the Geometric Properties of Laser Solid Formed Ti-6Al-4V</b><br>F.Y. Zhang, H. Tan, H. Chen and G.S. Liang        | 3343 |
| <b>3D Laser Remanufacturing of Damaged Parts</b><br>Y. Fang, X.C. Yang and J.B. Lei  | 3350 |
| <b>Optimization on Selective Fiber Laser Sintering of Tri-Metallic Powders via Design of Experiments Method</b><br>H.T. Liao, L.M. Trung and V.V. Truong | 3354 |
| <b>Current Progresses of Laser Assisted Machining of Aerospace Materials for Enhancing Tool Life</b><br>S.J. Sun, M. Brandt and J.P.T. Mo                | 3359 |

## Chapter 28: Products Design, Manufacture and Industry

|   |      |
|---|------|
| <b>Analysis of New Features of Beer Packaging Design</b><br>X. Man  | 3367 |
| <b>Innovative Vacuum Cleaner Design Using TRIZ Method</b><br>S.J. Hu, L.H. Su, J.C. Chen and C.Y. Wei   | 3372 |
| <b>Research &amp; Design of the Multifunctional Landscape Hedge Trimmer</b><br>Y.M. Meng, J. Wei, J.Z. Liang, Z. Dong, C.W. Qin and Q.W. Chen                             | 3377 |
| <b>Assessment System of Remaining Life for Bridge Crane Based on the Internet of Things</b><br>W.H. Gao, M.F. Li, S.G. Cao and D.H. Liu                                   | 3381 |
| <b>Characteristics of Marks on Concave Key Duplicated by Machine</b><br>Y. Jin  | 3386 |
| <b>Conceptual Approach for Design, Fabrication and Testing of Indoor Remotely Controlled Airship</b><br>N.I. Motiwala, I.A. Khan, N.P. Yelve, B.E. Narkhede and R.S. Pant | 3390 |
| <b>Deficiency Analysis of Different Ship Types Based on Taiwan PSC Data</b><br>J. Chen, Y.X. Jin, J.M. Chen and J.Z. Yuan   | 3396 |
| <b>Design and Experiment of <i>Sinonovacula constricta</i> Purification Bacteria System</b><br>W.F. Zhong, Y.H. Wang and H.Y. Liu   | 3401 |
| <b>Improvement of Packaging Structure and Materials about Daily Chemical Products Plastic Hose Packaging</b><br>Y. Yang and Y. Li   | 3406 |
| <b>Improvement of Structure and Material about Plastic Emulsion Pump for Daily Cosmetic Products Packaging</b><br>Y. Yang and Y. Li                                       | 3410 |
| <b>Optimization of a 17m Catamaran Based on the Resistance Performance</b><br>D.Z. Wang, F. Ma and L. Mei   | 3414 |
| <b>Research on High-Grade Anti-Counterfeiting Scratchcard Invoice Printing Technology and Craft</b><br>J. Ma, J.Y. Huang, S.L. Wu, X. Sun and R.L. Gai                    | 3419 |



|  |      |
|--|------|
| <b>Research on the Influence Factors of the Wave Collar Style</b><br>X.P. Zhang, M.H. Zhao and F.D. Kong   | 3423 |
| <b>SCA Based Exploratory Evaluation of Weapon Equipment Operational Effectiveness</b><br>Z.F. Li, H. Yuan and F. Yang  | 3428 |
| <b>Slip-Resistance Assessment on Different Types of Emery Anti-Slip Strip</b><br>C.C. Chen   | 3436 |
| <b>Study on a New Type Massage Device</b><br>S.N. Yu and Q.C. Yang   | 3441 |
| <b>The Development of Santana 2000 Lighting Test Rig</b><br>Y. Liu   | 3449 |
| <b>The Research on the Application of Kansei Engineering in the Product Design</b><br>R.Y. Liang, D.X. Chen, T.Y. Wang, X. Zhang, K.F. Wu, F.X. Lin, X.F. Xu and Y.C. Li | 3453 |
| <b>The Security and Function Improvement of Suitcase Based on Human Factors Engineering</b><br>W.T. Sun and Y.H. Zhang   | 3457 |
| <b>Variation Analysis for a Manufacturing Stage Based on a Balanced One-Way ANOVA Model</b><br>L. Zhang, Z.S. Zhang, Y.F. Zhou, M. Dai and J.F. Shi                      | 3461 |
| <b>Weave and Process Design of Monolayer Two-Sided Velvet Fabric</b><br>Y.Y. Qi, D. Zhou, Z.M. Jin and Y.X. Zhu  | 3466 |
| <b>Research on Material Selection and Sizes Optimization of Casing Material for Fracturing Wells under Existence of Brine Corrosion</b><br>L.F. Li                       | 3470 |
| <b>The Application of Parstat 2273 Electrochemical Workstation in Corrosion Experiment</b><br>X.F. Guo, B. Xu and Y. Wang  | 3474 |
| <b>Research on Improving the Pass Yield of the Manufacturing of 0645 Type of Sharpener</b><br>B. Su and Q.Y. Zeng  | 3478 |
| <b>Analysis of Current Situation of Digital Sculpture Development</b><br>W. Deng, Y. Chen and S.J. Hu  | 3482 |
| <b>Analysis of Snow-Ice Characteristics and Clearing Performance on Urban Road</b><br>Y.Q. Li, W.F. Wu, J.F. Wang, S.Y. Chen and X.X. Li                                 | 3486 |

## **Chapter 29: Mineral Materials, Mining and Mineral Process Engineering**

|  |      |
|--|------|
| <b>Experimental Study on Coal Entry with Water Trickling and Burst Cracked Roof Supported by Anchor Net</b><br>C.Q. Ma, B.Q. Dai, G.P. Qin and B. Xu   | 3493 |
| <b>Gaseous Fluorides Formation Mechanism in the Roasting Process of the Fluorite-Bearing Iron Concentrate</b><br>Y.C. Wang, J.L. Zhang, J. Wang, F. Zhang and G.P. Luo                         | 3498 |
| <b>Metallogenic Geological Characteristics and Metallogenic Model of Xiachen-Wangchangmu Fluorite Mine in Tiantai Basin, Zhejiang Province, China</b><br>H. Zou, Z.Z. Xu, Y. Fang and P. Zhang | 3506 |
| <b>Mine Laneway Modeling and Realization Based on the Matlab</b><br>L.X. Chen and M.N. Zhao  | 3512 |
| <b>Separate the Anshan-Type Low-Grade Hematite Ore With Process of Low-High Intensity Magnetic Separation and Reverse Flotation Method</b><br>Q.M. Jia, F.J. Li and Y. Li                      | 3517 |
| <b>Study on Comprehensive Utilizations of Certain Complex Paragenetic Tin Polymetallic Ore</b><br>X.Q. Chen, J.Z. Yang, Y.L. Mao, W.P. Yan and C.X. Li   | 3521 |
| <b>Mechanochemical Activation and Characterization of Low-Medium Grade Phosphorite Ore</b><br>Y. Xing, H. Gao, Y.F. Ying and D.Z. Qu   | 3529 |
| <b>Various Morphology of Hierarchical Pore-Structured Compound: MCM-41/Diatomite and its Adsorption Behavior for Methylene Blue</b><br>F.F. Li, M.S. Xia and Y.S. Jiang                        | 3533 |
| <b>Preliminary Study on Leaching Mechanism of Manganese Using Ternary Compound Reductant</b><br>W. Liu, C.C. Song, M. Sun, F.Z. Zong, Y. Zhang and J.G. Song                                   | 3541 |

|   |      |
|---|------|
| <b>Geostatistics Method for Identification of Minor Structure Seismic Attribute</b><br>L.J. Zhang, Y.Q. Ma, Z.L. Yu and J.J. Wei                          | 3545 |
| <b>Late Accumulation of Kunbei Area in Qaidam Basin</b><br>H. Shi and H. Li   | 3549 |
| <b>Study on Leaching Manganese from Low-Grade Manganese Ores Using Different Reductants</b><br>W. Liu, C.C. Song, Z.H. Wang and J.G. Song                 | 3553 |
| <b>Experimental Study on Gas Hydrates Dissociation in Sands by Depressurization</b><br>J.Y. Sun, Y.G. Ye, C.L. Liu and J. Zhang                           | 3557 |
| <b>Leaching of Low-Grade Manganese Ores by Using Two Compound Reductants</b><br>W. Liu, C.C. Song, X.Z. Wang and J.G. Song                                | 3561 |
| <b>The Study of the Factors which Influences the Dissolution Rate of the Halite</b><br>D.L. Lu, F.C. Jiang, C.S. Wei and X.Q. Fan                         | 3565 |
| <b>Paste Thickening of Iron Tailings with Vibrating Lamella Thickener</b><br>X.L. Zhou, Q.C. Xie, X.M. Zhang, Z.X. Shi, C.Q. Tian, L.Z. Chen and D.Y. Sun | 3570 |
| <b>Corrosion Effect of Acid Rain on the Technical Properties of Mineral Aggregates</b><br>X.J. Feng and X. Xiong  | 3576 |
| <b>The Analysis and Correction of Sampling Bias of Discontinuity Orientation Caused by Linear Sampling Technique</b><br>Y.W. Wang, Z.Q. Luo and H.Y. Zuo  | 3580 |