Table of Contents

Preface, Committees and Sponsors

Chapter 1: Metallurgy Technologies and Materials, Manufacturing Engineering

| Research on Reverse Engineering for Blades of Axial Flow Compressors Based on Parameterization | |
|--|----|
| W. Song, X.D. Lai, W. Zhang, Z. Lu and X.M. Chen | 3 |
| Metal Impurities Removal from Metallurgical Grade Silicon by Hydrochloric Acid Leaching | |
| X.M. Li, Y.M. Dang, W.F. Li, J.X. Zhao and Y.R. Cui | 7 |
| Distribution of Representative Impurities in Metallurgical-Grade Silicon Using CaO-SiO ₂ -CaF ₂ and CaO-SiO ₂ -CaCl ₂ Slags L.Q. Huang, H.X. Lai, C.H. Lu, M. Fang, J. Chen, Y.X. Lin, D.Q. Yu, J.T. Li, W.H. Ma, J.N. | |
| Shen and X.T. Luo The Artificial Neural Network Modeling of Dynamic Hysteresis Phase Diagram: | 11 |
| Application on Mean-Field Ising Hysteresis W. Laosiritaworn, K. Kanchiang and Y. Laosiritaworn | 16 |
| Effect of Crack Opening on Distribution of Magnetic Flux Density around Fatigue Cracks H. Tanabe, Y. Izumi, T. Takamatsu, J. Shimada, K. Kida and E.C. Santos | 20 |
| Numerical Simulation of Cathodic Protection for Jack-Up Platform A.K. Hu, Y. Guo, W. Wang and W. Jiang | 24 |
| Discussion of Track Tension for Heavy Tracked Vehicles M.X. Zhou, Y.P. Ren, L. Ye, Y. Zhou and G.Q. Wang | 30 |
| Effect of Heat Treatment on the Bending Behavior of STS/Al/STS Hybrid Metal Plates I.K. Kim and S.I. Hong | 34 |
| Corrosion and Soldering Behaviour of STD61 Coated by Arc Ion Plating Coatings S.W. Choi, Y.C. Kim, C.W. Kim, J.I. Cho and C.S. Kang | 39 |
| Mechanical Behavior of 3-ply Cu-Ni-Zn/Cu-Cr/Cu-Ni-Zn Composite Plate Processed by Roll Bonding | 43 |
| H.Y. Kim, J.S. Song and S.I. Hong Mechanical Property of (Al, Mg)B ₂ Phase Reinforced Al-Mg-B Alloys J.I. Cho and C.W. Kim | 43 |
| Structure Relaxations during the Isothermal Annealing of Amorphous Ca ₇ Mg ₃ Alloy L.L. Zhou, Y.L. Peng, H. Luo and R.S. Liu | 51 |
| Reaction Kinetics of Mg ₂ Si in the Laser Welding Pool of Aluminum Alloys L. Yang, Q.H. Wang, J. Li, Y. Liu and A.G. Huang | 55 |
| Dynamic Material Flow Analysis of Steel Resources in China Based on Circular Economy | |
| Theory P. Wang, Z.Y. Jiang, X.Y. Geng and S.Y. Hao | 64 |
| Effect of Solution Annealing and Low Temperature Ageing on the Microstructures and Superelastic Behaviour of Ti-50.7at.%Ni Alloy E. Hamzah, K. Hastuti, J. Hashim, C.E. Chuah and M.A. Khattak | 72 |
| Interoperability Challenges of ERP Implementation in a Collaborative Manufacturing | 12 |
| Environment Y.S. Ma | 81 |
| High Pressure Torsioning of Cu-9Fe-1.2X(X = Co, Ni, Ag) Microcomposites and their Microstructural and Mechanical Evolution | 07 |
| W.M. Choi and S.I. Hong Mechanical Reliability of Oxidized Zr-1.1Nb-0.5Cu Alloy Nuclear Cladding Tube in | 87 |
| Compression G.B. Jeong and S.I. Hong | 91 |

| Effect of Calcium Fluoride and Magnesia on the Performance of Tundish Coverture Fluxes Made of Blast Furnace Slag | |
|---|-----|
| Z.H. Zhang, B.L. Liu and Y. Ren | 96 |
| The Effects of Chromium-Free Insulating Coating on the Magnetic Properties in Grain-Oriented Electrical Steel T. Liu, Z.H. Luo, J.H. Mao, H. Yang and S.T. Hu | 100 |
| Effect of Heat Treatment on the Mechanical Properties of Roll-Bonded Al3003/STS439 Hybrid Plate | 100 |
| J.Y. Jin, I.K. Kim and S.I. Hong | 104 |
| Research on Optimization of the Electric Cylinder Buffer Made in Polyurethane Y. Lu, W.J. Li, X. Wang and J.F. Li | 108 |
| High Temperature Deformation and Creep Behaviors of Directionally Solidified (DS) Inconel 738LC Crystals J.S. Ha, S.U. An, P.W. Shin and S.I. Hong | 112 |
| Homology Analysis of Prior Austenite Grain Size of SAE52100 Bearing Steel Processed by Cyclic Heat Treatment K. Nakane, K. Kida and K. Mizobe | 116 |
| Homology Estimate of Grain Size Measurement Based on the JIS Samples K. Nakane, K. Mizobe and K. Kida | 120 |
| Green Growth vs. Leap-Forward Development in Less Developed Regions: A Case Study of Jiangxi Province of China K.Y. Long | 124 |
| Nickel Base Alloy Powder Spray Welding Process Application in Production Y.H. Xu and Y.P. Zhao | 129 |
| High Temperature Oxidation of Al-Alloyed SiMo Cast Iron in CO ₂ -Containing Atmospheres | 132 |
| S. Chandra-Ambhorn, T. Thublaor and P. Jiradech Effect of Controlling Process Parameters on Shrinkage Porosity in Aluminum Die-Casting | 132 |
| Rotor Y.C. Kim, S.W. Choi and C.S. Kang | 136 |
| FEA of Planetary Pipe Rolling Process for Stainless Steel J.K. Lee, D.B. Kim, J.G. Park, H.S. Shin, W.Y. Kim, I.H. Lee and H.Y. Cho | 144 |
| Multi-Layer Metal Matrix Alloy Surfacing Composite Material Fusion Research on the 45Mn-Austenitic Stainless Steel-(Cr-Ni) System Y.P. Zhao and Y.H. Xu | 148 |
| Hydrometallurgical Pretreatment Process for the Recovery of Valuable Metals from the Lead Anode Slime | |
| W.H. Wu, Z.J. Wang and J.B. Liu | 153 |
| Effect of Cooling Rate on the Microstructure of Al-5.17Cu-2.63Si Cast Alloy G.W. Zhao, X.C. Ye, Z.M. Shi and W.J. Liu | 157 |
| Processing Optimization of Optical Lens in the Injection Molding C.M. Lin and C.K. Wang | 161 |
| Experimental Study on Geometries Energy Absorption of Fiber Metal Laminated Mild Steel under Axial Compression M.I. Sahak, A.K. Mohamad and A.A. Ariffin | 165 |
| Influence of Process Parameters on the Fluidity of High Pressure Die-Casting Al-Si Alloys Y.C. Kim, S.W. Choi, C.W. Kim, J.I. Cho and C.S. Kang | 171 |
| The Effect of Alloying Elements on Thermal Conductivity of Aluminum Alloys in High Pressure Die Casting C.W. Kim, J.I. Cho, S.W. Choi and Y.C. Kim | 175 |
| In Situ Synthesis of TiB ₂ -TiC _{0.8} -40vol%SiC by Hot Pressing P.Q. Sun, D.G. Zhu, X.S. Jiang, H.L. Sun and S. Chen | 179 |
| Conceptual Design of a Multi-Functional Hot-Dip Galvanizing Simulator X.D. Hao and Q.F. Zhang | 188 |
| Technological Status and Tendency of Modern Blast Furnace F.M. Zhang, C.Z. Cao, X.L. Meng and L. Li | 192 |
| Philosophy and Application on Circulating Economy for Contemporary Steel Plant F.M. Zhang, X.L. Meng, C.Z. Cao and L. Li | 196 |

| Research on Task Sequencing of Mixed Model Assembly Workshop Based on Improved AHP | |
|---|-----|
| Z. Wang, Y.F. Song and G.Y. Cui | 201 |
| Advantages of MEMS and its Distinct New Applications Y.J. Chen | 205 |
| Multi-Purpose Hydrocyclone Research and Application F.L. Cui, W.X. Shi, X.B. Li and C.Q. Hao | 210 |
| Chapter 2: Minerals and Mining Engineering | |
| Analysis on the Construction of Psychological Assistance Mechanism of Emergency Coal Mine | |
| Y.X. Gao | 217 |
| A Research on Tailings Reprocessing from Da-Hongshan J. Liu, B. Yang, Q. Li, T. He and L. Lu | 221 |
| The Preliminary Results of Rock Physical Properties in Yudu-Ganxian Ore Concentration | |
| Area B. Zhao, J.G. Li, S.W. Sun, X.P. Zhou, Z.B. Wang, B. Xiang, D.M. Liu, K. Xiao and J.Q. Liu | 225 |
| A Copper Oxide Ore Treatment by Flotation B.L. Ge, Y.X. Fu and Q. Li | 230 |
| Roughing Conditions Research to Recover a Nickel Ore | 230 |
| B.L. Ge, Q. Li, J. Liu, Y.X. Fu and G.H. Hu | 234 |
| Experimental Research on Flotation of Copper Oxide Ore in Guizhou W.H. Pang, Q.J. Liu and P. Ding | 238 |
| Restoration of Disturbed Lands as the Factor of Environment Safety and Population Health in Mining Towns in the South of the Russian Far East L.T. Krupskaya, V.P. Zvereva and A.V. Krupskiy | 242 |
| Estimation of Effect of Hypergene Processes Proceeding in the Mining-Industrial Technogene System on the Hydrosphere of Dal'negorsk District Using Physicochemical Modeling Method (Primorsky Region) | |
| V.P. Zvereva, A.I. Lysenko and A.M. Kostina The Study on the Mineral Phase Transformations and Thermodynamics of Laterite Ores | 246 |
| Calcination Y.L. Xu, S. Chen, S.Q. Gui, Y.Y. Bian, W.Z. Ding and D.S. Tan | 250 |
| Magnesium Recovery from Desiliconization Slag of Nickel Laterite Ores by Carbonization W.N. Mu, S.Z. Shi and Y.C. Zhai | 255 |
| The Flotation Test of Collophanite in Yunnan Province H. Xiao, Q.J. Liu, M.G. Jiang and J.L. Yang | 259 |
| The 2D and 3D Stability Analysis of Spreader for Open-Pit Iron Mine X.L. Qian, Y.P. Ren, S.H. Gao and G.Q. Wang | 263 |
| Study on the Beneficiation Process of a Nickel Oxide Ore G.M. Shi and X.J. Yu | 269 |
| Optimizing Operational Performance of Diesel Mining Truck Using Thermal Management W. Nessim, F.J. Zhang, C.L. Zhao and Z.X. Zhu | 273 |
| The Study of Fluid Inclusions in Haoyaoerhudong Gold Deposit D.Q. Wang, J.C. Liu, H.D. Zhang, L.H. Zheng and W.H. Men | 278 |
| The Application of High Strength Anchor about Compound Roof Support about in Guantun Coal Mine C.G. Li, H.M. Duan and D.Q. Wang | 281 |
| A Discussion on the Reuse of Disused Mining Areas from a Land Reclamation Point of View, Using Dayoukeng as an Example | 201 |
| L.Y. Sheu, Y.L. Lee, S.B. Wen and Y.H. Shen | 284 |
| Studies of Mineralogical Characteristics on Vanadium Titanium Magnetite in Hongge Area, Panzhihua, Sichuan, China J.H. Luo, K.H. Qiu, Y.C. Qiu and P.C. Zhang | 292 |
| Effect of Ca ²⁺ and Mg ²⁺ on Floatability of Smithsonite and Hemimorphite M.X. Li, S. Jian and W.J. Zhao | 298 |

| Research on Gas Extraction from High Gas Coal Seam Group W.M. Yin | 302 |
|--|-----|
| Chapter 3: Advanced Materials Science and Technologies | |
| The Competition Effect of Strain and Interatomic Distance on Ferromagnetic Critical Temperature in Ising Ultra-Thin-Film: Monte Carlo Simulation Y. Laosiritaworn and W. Laosiritaworn | 311 |
| Investigation of Temperature-Driven Ferroelectric Phase Transition via Modified Heisenberg Model: The Monte Carlo Simulation S. Srinoi and Y. Laosiritaworn | 315 |
| Dependence of Neel Temperature on Ultrathin Film Thickness L.L. Afremov and A. Petrov | 319 |
| Influence of NaOH Quantity upon the Size and Luminescent Property of Core-Shell Gd ₂ O ₃ :Tb ³⁺ /SiOx Nanoparticles M.G. Ou, C.L. Yang, S.H. Cai and P. Perriat | 323 |
| High Pressure Properties of Superconducting Material Palladium W.M. Peng, Z.L. Liu and H.Z. Fu | 327 |
| Preparation and Study of Rare Earth Oxide Nanoparticles with Core-Shell Structure M.G. Ou, C.L. Yang, S.H. Cai and Q.W. Zhu | 332 |
| Performance of Vertically Aligned MWCNTs/Ni/Ti/Au/Si Electrode for Supercapacitors by CVD | |
| T.F. Hsieh and M.L. You Characteristics Study of Radio Frequency Sputtered TiO ₂ Films on ZnO Nanorods Grown | 336 |
| by Hydrothermal Method W.R. Chen, Y.S. Lin and H.Y. Chen | 340 |
| Investigation on Recovery and Recrystallization of Al-Si-Al ₂ O ₃ Composites X.W. Wang, X.S. Jiang, D.G. Zhu and L. Zhang | 345 |
| High Sensitive Capacitive Touch Panel with Chain or Mountain-Shaped ITO Electrodes H.T. Huang, H.Y. Chen and K.C. Yeh | 351 |
| Study on Micro-Fracture Chaotic Evolution under External Loading Rock T.T. Wang, W.C. Zhao, Y.H. Liu, L. Yang and H.Y. Gao | 355 |
| Research on the 45Mn Materials Forging Properties Y.P. Zhao and Y.H. Xu | 359 |
| Effect of LiCl·H ₂ O on Sintering Properties of MgO from Bischofite Q.Z. Huang, G.M. Lu and J.G. Yu | 364 |
| Investigate the Characteristics of 0.65(K _{0.5} Bi _{0.5} TiO ₃)-0.35BaTiO ₃ Films at Various Deposition Temperatures | |
| W.C. Tzou, C.G. Kuo, P.S. Cheng, Y.H. Lin and C.F. Yang The Study of Rheological and Mechanical Properties of the Antarctic Krill Protein/Sodium | 372 |
| Alginate Fibers J. Guo, X.C. Li, Y.Y. Zhang, L. Zhang, C.F. Yu, F.C. Guan and Z.C. Wang Research on Performances of Environmentally Friendly Multi-Component Corrosion | 377 |
| Inhibitor Z.F. Liu, Y.J. Wu, L.H. Zhang, H.L. Fu and X. Liu | 382 |
| A New Fast Multipole Boundary Element Method for Solving 3-D Elastic Problem H.L. Gui, Q. Li, Y.G. Li, X. Yang and Q.X. Huang | 387 |
| Strength Development of Soft Bangkok Clay Mixed with Cement K. Piriyakul | 391 |
| Experimental Study on Elastic Stiffness of Kaolinite Clay K. Piriyakul | 395 |
| Controlled Release Behaviors of Ketoprofen from Matrix Polymer of Chitosan and poly(ethylene glycol) C. Thitipha and T. Chimsook | 399 |
| Study on Sodium-Calcining of Boron Concentrate T. Jiang, L. Yin, L. Zhu and X.X. Xue | 403 |
| Influence of Frequency on Fretting Fatigue Damage Behavior of Al-Zn-Mg Alloy D. Liu, X.S. Jiang, P.Q. Sun and Y. Shen | 407 |

| Preparation of Copper Doped L-Threonine Modified Electrode and its Application in Determination of Hydroquinone | |
|---|-----|
| Y. Hua, Z.R. Song, J.H. He, Y. Zhang and C.B. Hu | 413 |
| Research on Manufacturing Process of Carbon-Carbon Composites as Ablation Resistance Materials | 410 |
| J.C. Liu, D.Y. Wang, Y.W. Chen, S.H. Li and H.Z. Wei | 419 |
| Effects of Mn and Ca Additions on Microstructure and Mechanical Properties of Al-Mg Alloy | |
| S.W. Choi, Y.C. Kim, C.S. Kang, J.M. Jung and S.K. Hong | 427 |
| Intelligent Numerical Manipulation of Micrometer-Scale Emulsions Using Polymer Confinement | 421 |
| L.G. Zhang, L.X. Xue, P.Y. He, Y.M. Qi and Y.M. Lu | 431 |
| Chemical Bath Deposition of ZnS Buffer Layers T. Quan | 435 |
| Chapter 4: Materials Processes Technology | |
| Effects of Chloride and Sulphate Ions on the Experimental E-pH Diagrams of AISI 316L Stainless Steel in Deaerated Aqueous Solutions | 442 |
| C.A. Somrerk, W. Wachirasiri and G. Lothongkum Effects of H ₂ Flow Rate and H ₂ Plasma Treatment on the Properties of AZO Films | 443 |
| C.G. Kuo, C.L. Li, C.C. Huang, F.H. Wang, C.F. Yang and I.C. Chen | 447 |
| Recovery of Copper from Waste Printed Circuit Boards by Suspension Electrolysis L. Zhang, L.X. Qiu, X.L. Xi, L.W. Ma, L.W. Zhang, Z.H. Wang and J.F. Zhou | 452 |
| Experimental Measurement of Induction Period of Gypsum Precipitation in the Laminar Flow State | |
| H.G. Cheng, H.P. Song, F.Q. Cheng and Z.H. Li | 456 |
| Surface Quality Prediction of Atmospheric Pressure Plasma Arc Cleaning Based on Least Square Support Vector Machine | |
| Z.M. Yin, X.J. Dong and J.B. Meng | 460 |
| Study on Surface Pre-Treatment of FeCrAl Metallic Substrate for Hydrogen Production Catalysts | 465 |
| X.X. Zhang, K. Su, F.L. Zeng, Y.W. Zhang, Q.F. Zhang and W.Z. Ding The Influence of Medification Conditions on Activation of Cool Fly. Ash | 465 |
| The Influence of Modification Conditions on Activation of Coal Fly Ash H.P. Song, F.B. Xue, F.Q. Cheng, Y.X. Guo and H.G. Cheng | 471 |
| Vibration-Assisted Electrochemical Polishing for Extremely Smooth Surface Generation U.S. Kim and J.W. Park | 475 |
| Prediction of Properties of Cu-15Ni-8Sn Alloys Based on Least Square Support Vector Machines | 470 |
| S.F. Fang and M.P. Wang | 479 |
| Decomposition of Ilmenite by Ammonium Hydroxide H.B. Tang and Y.M. Liu | 484 |
| Research Advances on Application Status and Non-Thermal Efficiency of Microwave Pyrolysis | 400 |
| X.C. Zhao, Z. Li, Y.R. Jiang, K. Xu and Y.J. Zhao | 489 |
| Precipitation Phase and Impurities Distribution of Metallurgical Grade Silicon by Vacuum Refining Followed Slag Treatment H.X. Lai, L.Q. Huang, M. Fang, C.H. Lu, J. Chen, D.Q. Yu, J.T. Li, W.H. Ma, J.N. Shen and | |
| X.T. Luo | 492 |
| Boron Removal from Metallurgical-Grade Silicon by Slag Refining with Yttria-Silica System | |
| C.H. Lu, M. Fang, L.Q. Huang, H.X. Lai, J. Chen, Y.Q. Chen, J.T. Li, W.H. Ma, Z.L. Sheng and X.T. Luo | 497 |
| Preparation of Porous Mullite Ceramics with Low Thermal Conductivity L.L. Gong, Y.H. Wang, X.D. Cheng, R.F. Zhang and H.P. Zhang | 502 |
| Removal of Cr(III) from Acid-Dissolution Water of Chromium Sludge by Cation Exchange | |
| Resin H. Li, Z.F. Chi and J.Z. Li | 506 |

| Study on the Removal of Cadmium from Underground Water Using a Complex Modulation | |
|---|-----|
| Electromagnetic Device Based on Correlation of Electromagnetic Field and Electrical | |
| Conductivity | |
| S.A. Ha, B.H. Jung, J.M. Lee, K.H. Kim and J.P. Wang | 514 |
| Derivation of Optimum Study Factors for Samples Contaminated with Cd Using | |
| Electric/Magnetic Field and ORP | |
| S.A. Ha and J.P. Wang | 519 |
| | |