

Table of Contents

Committees, Sponsors and Preface

A. Materials for Environment Preservation, Energy Conservation and New Energy

Preparation of Atomic Oxygen Oxidant by Electrolysis with Ultrasonic L.B. Li, J.Q. Xue, T. Hong, M. Wang and J. Yang	1
Adsorption of Hazardous Heavy Metals Using Reactive Inorganic Agents in Synthetic Wastewater J.O. Kim and J.W. Lee	5
Synthesis of Spherical Carbon Nanoparticles and their EDLC Properties G.B. Zheng, H. Sano and Y. Uchiyama	9
In-Flight Behaviors and Properties of Plasma-Sprayed Tungsten Coatings Y.R. Niu, D.Y. Hu, H. Ji and X.B. Zheng	13
Thermoelectric and Transport Properties of In-Filled CoSb₃ Skutterudites J.Y. Jung, K.H. Park, S.C. Ur and I.H. Kim	17
Synthesis and Electronic Transport Properties of Sn-Doped CoSb₃ K.H. Park, J.Y. Jung, J.I. Lee, K.W. Jang, W.G. Kim and I.H. Kim	21
Strength and Densification of Ni/Al₂O₃ Membrane Compacted with Uniaxial Pressing and CIP for Hydrogen Separation: Influence of Pressing Process S. Vichaphund and D. Atong	25
Effect of Complexing Agent on Morphology and Crystal Structure of La_{1-x}Ce_xCoO₃ (x=0, 0.2, and 0.4) Perovskite-Type Mixed Oxides Catalyst Prepared by Sol-Gel Method K. Soongprasit, D. Aht-Ong, V. Sricharoenchaikul and D. Atong	29
Synthesis and Thermoelectric Properties of Half-Heusler Zr-Ni-Sn Alloy Processed by Mechanically Alloying and Hot Pressing I.H. Kim, J.C. Kwon, Y.G. Lee, M.S. Yoon, S.L. Ryu, W.G. Kim and S.C. Ur	33
Preferential Oxidation of CO over Pt Catalysts Supported on Mesoporous Aluminosilicates in the Presence of H₂ R. Nakanishi, K. Inukai, M. Maeda, M. Suzuki and Y. Tai	37
Synthesis and Characterization of Poly(ether ketone) Containing Side Sulfonic Acid Group for Proton Exchange Membrane Fuel Cell D.W. Seo, Y.D. Lim, S.H. Lee, T.W. Hong, S.C. Ur, I.H. Kim and W.G. Kim	41
Adsorption of Ag⁺ from Aqueous Solutions by Rice Husk X.Q. Luo, X.Y. Lin, X.G. Luo, A.K. Luo and X. Liang	45
Synthesis and Characterization of Dumbbell Shaped Calcium Carbonate Induced by Lignin W.K. Zhu, X.G. Luo, A.K. Luo and X. Liang	49
Fixed Bed Column Filled with Rice Husk for the Removal of Cu (II) from Aqueous Solution Z.F. Deng, X.G. Luo and X.Y. Lin	53
Study on the Energy Conversion from the Dynamic Load of Vehicles on the Road Using Piezoelectric Materials J.Y. Lee, M.K. Lee, J.G. Oh and K.S. Kim	57
Effect of Matrix on Phase Formation of Nanometer TiO₂ Film Z.Y. Deng, L.L. Zhu, W.Z. Gai and J.M.F. Ferreira	61
AFM Studies on the Effect of Crystalline Interphase on Adhesion of Polyurethane Thin Film to Al Substrate J.S. Kim, O.H. Lee and Y.S. Lim	65
Lead Based Multi-Alloy Applied to Anode of Zinc Electrowinning J. Zhu, X. Li, M.B. Liu and Y. Zhai	69
Effect of Silicon Carbide Susceptor and Nickel Catalyst Content on Microwave Enhanced Thermal Conversion of Glycerol Waste Y. Hawangchu, D. Atong and V. Sricharoenchaikul	73
Synthesis of Nickel-Coated FeS₂ Particles as Active Material for Li/FeS₂ Cell by Mechanical Alloying X.J. Liu, S.D. Kang, Z.Z. Xu and I.S. Ahn	77

Optical and Electrical Properties of Large Area SnO₂: F Thin Films by Spray Pyrolysis G.Y. Zhao, Y. Ren, Y. Gao and J. Shen	81
Preparation of Textured PZT/LaNiO₃ Films on LaAlO₃ Substrates by Sol-Gel Process Q.L. Liu, G.Y. Zhao, K.L. Mao and Y.Q. Chen	85

B. Materials Processing Technologies for Reduction of Environmental Impact

Synthesis of Ti₂AlC/Al₂O₃ Nanocomposites by High Energy Milling and Heat Treatment J.F. Zhu, G.Q. Qi, H.B. Yang and F. Wang	89
Study on Preparation of Silica Aerogels/Polystyrene Microspheres with Core-Shell Structure G.Q. Geng, X.J. Liu and G.X. Bian	93
Non-Emulsifiers Multi-Liquid-Crystallized-Phase Opalescence Glaze F. Wang, Q. Li, H.J. Luo and J.F. Zhu	97
Relation between Phosphorus Amounts Absorbed by Volcanic Ash Fall Deposits and its Calcinating Temperature E. Watanabe, K. Nishizawa and M. Maeda	101
Synthesis of V-ZrSiO₄ Blue Ceramic Pigments K.R. Pyon and B.H. Lee	105
Synthesis of Forsterite Pigment for Underglaze Colors H.S. Lee and B.H. Lee	109
Optimization of Manufacturing Conditions for Activated Carbon from Coffee (<i>Coffea Arabica</i> L.) Bean Waste by Chemical Activation C. Pechyen, D. Aht-Ong, V. Sricharoenchaikul and D. Atong	113
Surface Characterization of Oxygen Plasma Treated Nano-SiO₂ Sol-Gel Coating UHMWPE Filaments Y.C. Zhang, F.J. Shi, J.X. He, H.Y. Wu and Y.P. Qiu	117
Pyrolysis of Solid Waste by Thermogravimetric Analysis L. Li and X.G. Luo	121
Preparation and Characterization of Thermoplastic Soy Protein Isolate Y. Lu, X.G. Luo, X.Y. Lin and P. He	125
An Enhanced Algorithm for Detecting Blisters of Glass by Machine Vision C.H. Han, Y.K. Ryu, C.S. Oh and B.W. Choi	129
Effects of Carbon Fiber Architecture on the Microstructure and Mechanical Property of C/C-SiC Composites J. Wang, J.Y. Lou, Z. Xu, Z.H. Jin and G.J. Qiao	133
Process Feasibility Study on Thermal-Plasma System for HFC-23 Decomposition J.K. Lee, K.Y. Cho, S.D. Lee, H.Y. Lee, W.Y. Chang and J.C. Lim	137
Modeling of the Stress in 13Cr Supermartensitic Stainless Steel Welds by Artificial Neural Network J.H. Yu, D.N. Zou, Y. Han and Z.Y. Chen	141
Artificial Neural Network Approach to Predict Mechanical Properties of 301 Austenitic Stainless Steel Z.Y. Chen, D.N. Zou, J.H. Yu and Y. Han	145
Study of Cyclohexane Photooxidation over Pt-WO₃ Catalysts Mixed with TiO₂ under Visible Light Irradiation Y. Ichihashi, S. Saijo, M. Taniguchi, K. Taniya and S. Nishiyama	149
Removal of NO₂ and SO₂ Using Porous Media Made from Sewage Sludge Y.S. Yoo, E.Z. Park, H.J. Ban and H.J. Chae	153
Influence of Strain Aging on the Microstructure-Property of an X100 Pipeline Steel X.Y. Zhang, H.L. Gao, L.K. Ji and C.J. Zhuang	157
Effect of Electron Beam Irradiation on the Properties of Polyethylene Oxide-TiO₂ Composite Electrolyte for Dye Sensitized Solar Cells M. Shaheer Akhtar, U.Y. Kim, D.J. Choi and O.B. Yang	161

C. Eco-Materials Processing and Design

Study on the Static Recrystallization Behavior of Thermal Deformation of Austenitic Stainless Steel for Nuclear Power	
J. Liu, G.W. Fan, P.D. Han, J.F. Yang, J.S. Liu, D.S. Ge and G.J. Qiao	165
Synthesis of Ternary Machinable $\text{Al}_2\text{O}_3/\text{Ti}_2\text{AlC}$ Composites by High Energy Milling and <i>In Situ</i> Hot-Pressing Method	
F. Wang, B.B. Liu, J.F. Zhu and Y.L. Li	169
Novel Preparation of Silver-Coated Copper in Aqueous Solution	
Y.H. Song, T. Su, Y. Yang, X.Z. Lan and H. Zhan	173
The Theoretical Research of Constitutive Property, Reactivity and FTIR of Chitosan	
J.Q. Xue, D.D. Wen, L.H. Yu, Y.J. Wang and J. Zhu	177
Synthesis of Ti_3AlC_2 Powder by High Energy Ball Milling and High Temperature Heat Treatment	
J.F. Zhu, G.Q. Qi, H.B. Yang and F. Wang	181
Scale and Corrosion Inhibition Efficiency of a Novel Terpolymer	
M. Wu, J.Q. Xue, L.H. Yu, X.N. Ma and J. Zhu	185
Effect of Foaming Temperature on Pore Morphology of Al/AlN Composite Foam Fabricated by Melt Foaming Method	
Y.H. Song, M. Tane, T. Ide, Y. Seimiya, B.Y. Hur and H. Nakajima	189
Dynamic Compression Behavior of Lotus-Type Porous Iron	
M. Tane, T. Kawashima, K. Horikawa, H. Kobayashi and H. Nakajima	193
Formation of Hollow and Porous Nanostructures of Iron Oxides via Oxidation of Iron Nanoparticles and Nanowires	
R. Nakamura and H. Nakajima	197
Fabrication of Lotus-Type Porous Magnesium with Anisotropic Directional Pores by Mold Casting Technique	
K. Sugihara, S. Suzuki and H. Nakajima	201
Fabrication of Lotus-Type Porous Al-Ti Alloys Using the Continuous Casting Technique	
T.B. Kim, S. Suzuki and H. Nakajima	207
Effect of Transfer Velocity on Porosity of Lotus-Type Porous Aluminum Fabricated by Continuous Casting Technique	
Y. Iio, T. Ide and H. Nakajima	211
Effect of Addition of NiO Powder on Pore Formation in Lotus-Type Porous Carbon Steel Fabricated by Continuous Casting	
M. Kashiwara, H. Yonetani, S. Suzuki and H. Nakajima	215
Effect of Pore Diameter Distribution on Heat Transfer Capacity of Lotus-Type Porous Copper Heat Sink for Air Cooling	
H. Chiba, T. Ogushi, S. Ueno and H. Nakajima	220
Evaluating Durability and Burying Characteristic of PVC Pipe	
H.D. Lee, P.J. Kwak and J.Y. Lee	224
Hot Corrosion of $\text{NiCrAlY}/(\text{ZrO}_2\text{-CeO}_2\text{-Y}_2\text{O}_3)$ Composite Coatings in $\text{NaCl-Na}_2\text{SO}_4$ Molten Salt	
J.H. Lee and D.B. Lee	228
Formation of Oxide Nanotubes and Bamboo-Like Structures via Oxidation of Cu, Fe and Ni Nanowires	
G. Matsubayashi, R. Nakamura, H. Tsuchiya, S. Fujimoto and H. Nakajima	232
Study on Bonding Performances of Air Plasma Treated FRP	
Y.L. Xiong, J.Y. Gu and Y.C. Hu	236
Fabrication of Lotus-Type Porous Iron by Thermal Decomposition Method	
T. Ide, T. Wada and H. Nakajima	240
EPP (Expanded Polypropylene) Media for Treating Trace Metals from Road Runoff: Performance Risk Assessment Using Uncertainty Analysis	
S.W. Kang, S.K. Kim, S.L. Yun, H.C. Oh and J.H. Ahn	244
Experiment on Combustion-Supporting Agent on PCI for Combustibility of Coal Powder	
S.P. Yang, J. Dong and M. Wang	248
Effects of Oxygen Plasma Treated Carbon Nanotube Coating Basalt Filaments	
H.Y. Wu, W. Zhang, Y.C. Zhang and Y.P. Qiu	252
Influence of Vanadium on Aging Characteristics of Cold Rolled Cu-Ni-Si Alloy	
Z.P. Que, H.M. Jung, J.H. Lee, K.J. Euh and S.Z. Han	256

Experimental Study on Thermal Characteristics of Environment-Friendly Blocks with Water-Absorbing Polymer	260
J.B. Park, R.H. Kim, S.H. Lee and H.B. Pyun	
Study on Thermal Environmental Characteristics of Water-Retentive Asphalt Pavement	264
H.B. Pyun, R.H. Kim, S.H. Lee and J.B. Park	
3D Free Form Fabrication Using the Pivoting Side Trowel with Ceramic Material	268
H.K. Kwon and M.K. Jang	
Optimization Design of the Bonding Property between Flanges and Web Plates of Wood I-Joists	272
Y.C. Hu, X.J. Zhang, F.C. Cheng, L. Zhang and J. Li	
Use of Fly Ash as Bonding Material on Low Thermal Expansion Porous Materials	276
I. Juárez-Ramírez, A. Zaldivar-Cadena, L.M. Torres-Martínez, S.I. Suárez-Vázquez, A. Sánchez-Vázquez, K. Matsumaru and K. Ishizaki	
Red Tide Inactivation by Silver Doped TiO₂ Produced in Sono-Chemistry Method	280
S.H. Cho, Z.Y. Fu, K. Niihara, S. Obregon-Alfaro and S.W. Lee	
The Dominant Factor Analysis of Production Technology of Poplar LVL Based on Grey Theory	284
F. Li and Y.C. Hu	
The Development of Solid Fabric Filter for CSOs Treatment	288
H.C. Oh, S.K. Kim, S.W. Kang, S.L. Yun and J.H. Ahn	
Strength Enhancement of Geopolymer-Based Concretes by Mixed Alkaline Activators	292
Z.X. Yang, K.H. Hwang, M.C. Kim, J.Y. Yang and S.K. Lim	
Evaluation on Application of Artificial Soil Made by Organic Wastes	296
Y.S. Yoo, H.J. Chae, H.J. Ban and E.Z. Park	
Development of Non Explosive Insulating and Fire Proof Materials Using Porous Industrial Byproducts	300
S.R. Kim, W.T. Kwon, B.I. Kim, Y. Kim and S.W. Ha	
Decomposition Characteristics of Wood Using Supercritical Methanol for Biodiesel Production	304
S.C. Oh, Y. Kim and S.R. Kim	
Effect of SiC Particle Size on Anti-Oxidation Behavior of C/B₄C/SiC Composite	308
H. Sano, G.B. Zheng and Y. Uchiyama	
Eco-Friendly Fabrication Process of AlTiC Grain Refiner	312
H. Cho	
Efficiency Evaluations of Filter Media for Reduction of Non Point Source in Urban Area	316
S.K. Kim, H.C. Oh, S.W. Kang, S.L. Yun and J.H. Ahn	
Corrosion Control of Drinking Water Copper Pipes by Corrosion Inhibitor	320
J.H. Ahn, H.D. Lee, S.K. Kim, P.J. Kwak and J.Y. Lee	
Application of Polymer Media to the Site for Treatment of Pollutants in Rainfall Effluent of Urban District	324
S.L. Yun, S.W. Kang, S.K. Kim, J.H. Ahn and H.C. Oh	
Deformation of Lotus-Type Porous Copper in Rolling	328
H. Utsunomiya, T. Yukimoto, T. Sakai, S. Suzuki and H. Nakajima	
Elastic and Plastic Deformation Behaviors of Lotus-Type Porous Copper	332
M. Tane and H. Nakajima	
Blow Forming of Lightweight Titanium Components	336
H.S. Lee, J.H. Yoon and Y.M. Yi	
 D. High Performance Materials Including Nano-Materials for the Environment	
High Purity Ti₂AlC Powder Prepared by a Novel Method	340
J.F. Zhu, G.Q. Qi, F. Wang and H.B. Yang	
Effect of Atmosphere on the Crystallization of Amorphous Silicon Nitride	344
L. Fan, H.J. Wang and J.S. Yue	
The Mechanical Properties and Fracture Characteristics of AlN/Ti Laminated Composites	348
T. Zhang, W.Z. Li, H.Y. Jin, G.J. Qiao and Z.H. Jin	

Effect of Processing Condition on the Microstructure and Mechanical Properties of Ti₃SiC₂/SiC Composites H.F. Yin and L.L. Lu	352
Fabrication and Microstructure of Fe-Al Intermetallic Compound Powders by Mechanical Alloying T. Jiang and H.Y. Jin	356
Ni Nanoparticles Deposition onto CNTs by Electroless Plating G.S. Cho, J.K. Lim, K.H. Choe and W.S. Lee	360
Study on the Erosion Wear Properties of Reaction-Bonded SiC Z.L. Lu, Z.G. Xing, Y.X. Zhou and H. Xie	364
Effect of SiC Particle Sizes on Erosion Wear Behaviour of SiC/Epoxy Resin Composite Z.L. Lu, Z.G. Xing, H. Xie and Y.X. Zhou	368
Effects of Thickness on Thermal and Mechanical Properties of Air-Plasma Sprayed Thermal Barrier Coatings S.Y. Lee, J.Y. Kwon, T.W. Kang, Y. Jung and U.Y. Paik	372
Microstructure Characterization of Duplex Stainless Steel Welding Joint with Different Solution and Aging Treatment J. Yang, T.Y. Zhang, J.H. Yu, W. Zhang and J. Li	376
Influence of Sigma Phase Precipitation on Pitting Corrosion of 2507 Super-Duplex Stainless Steel Y. Han, D.N. Zou, W. Zhang, J.H. Yu and Y.Y. Qiao	380
Improvement of Oxidation Resistance of SiC/C (Graphite) Composites by Silicon Infiltration in Surface H.W. Li, Q. Zhang, Z.H. Jin, J. Wang and H.Y. Jin	384
Studies on the Molecular Chain Conformation and Morphology of Konjac Glucomannan in Aqueous Solution X.Y. Long, X.G. Luo, J. Bai and J.F. Zhu	388
Nano Composite Membranes of Sulfonated Amine-Poly(ether sulfone)s and SiO₂ for Fuel Cell Application D.W. Seo, Y.D. Lim, S.H. Lee, M.M. Islam, H.M. Jin, K.H. Lee, H.H. Jang and W.G. Kim	392
Synthesis and Characterization of Aminoalky Cellulose H.G. Zhu, X.Y. Lin, X.G. Luo and J.P. Zhang	396
Synthesis of SiOC Base Fibers from Silicone Resin with Low Carbon Content and Control of Surface Functionality by Metal Chloride Treatment in Vapor M. Narisawa, Y. Satoh, R. Sumimoto, T. Kamegawa and H. Yamashita	400
Effects of Different Solid Lubricants on Mechanical and Tribological Properties of Al₂O₃/ZrO₂ Nanocomposites S.H. Kim, S.H. Cho, S.P. Hannula and S.W. Lee	404
Microstructure and Wear Performance of Cu-Mo-Si Alloys Fabricated by Self-Propagation High-Temperature Synthesis H. Xie, L. Jia, S.M. Wang, J.L. Zhu and Z.L. Lu	408
Microstructure and Mechanical Properties of Ca-α-Sialon with Low Oxygen Content Z.F. Yang, H. Wang, X.M. Min, W.M. Wang and Z.Y. Fu	412
High Strength and Toughness Al₂O₃ Composite Materials for the Improvement of Ceramic Channel in SRL Hot Dipping System H.H. Lee, S.H. Kim, B. Joshi, S.H. Cho and S.W. Lee	416
Influence of Preparation Methods of Supported Zr Oxide Catalysts for Meerwein-Ponndorf-Verlay Reduction of Acetophenone K. Taniya, A. Izumi, Y. Ichihashi and S. Nishiyama	420
Electrodeposition of Ni-SiC Nano Composite in Presence of Ultrasound G. Gyawali, S.H. Cho, D.J. Woo and S.W. Lee	424
Boron Nitride Doped Transparent Polycrystalline Silicon Nitride Ceramics B. Joshi, H.H. Lee, S.H. Kim, Z.Y. Fu, K. Niihara and S.W. Lee	428
Effect of Solution Temperature on Microstructure of 2205 Duplex Stainless Steel Welded Joints Y.Y. Qiao, D.N. Zou, J. Li and Y. Han	432
Front End Bending in Plate Rolling Influenced by Asymmetrical Entrance Angle Y.H. Pang, Y.L. Hu, Q. Sun, C.R. Liu, H.F. Yu, B. Lu and M.M. Zhang	436

A Model of Calculating Contact Length between Stock and Roll during Plate Rolling Q. Sun, Y.H. Pang, C.R. Liu, H.F. Yu, B. Lu and M.M. Zhang	440
Effects of the Cooling Rate on the Solidification Microstructure of Cu-Ni Alloy J.W. Yuan, Y.H. Pang, Y.L. Hu, Q. Sun, D. Liu and Y.H. Yang	444
Study on the Microstructure of Au/CdZnTe Interface by HRTEM S. Jie, L. Fu and N.Z. Ming	448
Surface Nanocrystallization of Zircaloy-4 by Surface Mechanical Attrition Treatment C.H. Zhang, X.G. Duan, L. Zhou and X.Z. Lan	452

E. Hybrid Materials and Composites for Eco Society

Improvement of the Dry Friction and Wear Properties of the Si/SiC by Doping with Ni and PbO K.Z. Sang, W.C. Wang and G.Q. Geng	456
Fabrication and Thermal Property of AlN/ Epoxy Composites H.Y. Jin, H.C. Shi, B. He, N.K. Gao and Z.R. Peng	460
Preparation and Dielectric Properties of Alumina Filled Epoxy Nano-Composite H.C. Shi, N.K. Gao, H.Y. Jin and C.B. Wang	463
Optimization Fabrication of Plasma Treated Nano-Titanium Dioxide Particles/PP/PLA Composites Filaments Using Melt Spinning Y.C. Zhang, Z.F. Zhu, H.Y. Wu and Y.P. Qiu	467
Electroless Copper Plating on Ti_3SiC_2 Powder Surface Using Ascorbic Acid as a Reducing Agent Y.R. Cui, Y.H. Xu, K.M. Li, X.M. Li, J. Yang and J. Wang	471
Dynamic and Static Properties of Wood-Plastic Composites Made of Recycled High-Density Polyethylene G.W. Yu, Y.C. Hu and J.Y. Gu	475
Analysis on Microstructure and Mechanical Properties of Pine Laminated Veneer Lumber B. Xue, Y.C. Hu, F.C. Cheng and L. Zhang	479

F. Photocatalysis for a Better Environment and Clean Energy

Fabrication and Application of Photocatalytic TiO_2 Metal Membrane with Self-Organized Nano Tubes for Water Treatment J.O. Kim and W.Y. Choi	483
A New Preparation Method of Visible Light Responsive Titanium Dioxide Photocatalytic Films by Ultraviolet Irradiation K. Nishizawa, E. Watanabe and M. Maeda	487
Sol-Gel Preparation of Bi_2InTaO_7 and its Photocatalytic Behavior for Organic Compounds Degradation L.M. Torres-Martínez, I. Juárez-Ramírez, J.S. Ramos-Garza, F. Vázquez-Acosta and S.W. Lee	491
Effect of Calcination Temperature on the Photocatalytic Activity of Porous TiO_2 Film T. Miki, K. Nishizawa, E. Watanabe and H. Taoda	495
Synergistic Effects of Ferric Stearate, Ferrocene and NiDBC Z. Zhao, X.G. Luo and X.Y. Lin	499

G. Dye-Sensitized Solar Cells for the Utilization of Solar Energy

Photoinduced Absorption in P3HT/PCBM Bulk Heterostructures K. Kinoshita, T. Kobayashi, T. Nagase and H. Naito	503
Evaluation Methods of Energy-Storable Dye-Sensitized Solar Cells Y. Saito, K. Iwata, S. Uchida, T. Kubo and H. Segawa	507

H. Bio-Inspired Materials for a Better Life and Other Novel Materials

<i>In Vitro</i> Bioactivity, Cytotoxicity and Blood Compatibility of Anti-Bacterial Vacuum Plasma Sprayed Titanium Coatings Y.K. Chen, X.B. Zheng, B.O. Li, Y.T. Xie and C.X. Ding	511
--	-----