

Table of Contents

Preface

Symposium E: Materials in Microelectronic and Optoelectronic Industry

Process Control of Buried Layer Epitaxy by Barrel Type Furnace Y.H. Wang, J.J. Zhao, H. Luo and L.B. Ma	3
Ru Thin Film Formation Using Oxygen Plasma Enhanced ALD and Rapid Thermal Processing C.M. Zhang, X.Y. Liu, L.Q. Zhang, H.L. Lu, P.F. Wang and D.W. Zhang	8
Research on Surface Roughness of Acid Etched Silicon Wafers B.L. You, X.N. Zhang, C. Luo, X.K. Sun, K.F. Wu, S. Feng and L.H. Zhang	14
Investigation of Chemical Vapor Deposited Graphene Film on Oxide Substrate T. Huang, L. Chen, Q.Q. Sun, P. Zhou and D.W. Zhang	18
Ultrahigh Purity Copper Alloy Target Used Innanoscale ULSI Interconnects H. Zeng, C. Lv, Y. Gao, T.Y. Dong, Y.H. Wang and X.Q. Wang	22
Property of an AlGaIn/GaN MIS Diode with Si₃N₄/Al₂O₃ Bilayer Gate Dielectric Films L.Y. Shen, X.H. Cheng, Z.J. Wang, D. Cao, L. Zheng, C. Xia and Y.H. Yu	30
A New Type of Self-Aligned Technology for RF and Microwave Graphene Field-Effect Transistors Y. Wu, Z.F. Ma, L. Du, P. Zhang and L. He	36
Electron Beam Annealing for Component Optimization in Si-Sb-Te Material Y. Cheng, S.N. Song, Z.H. Zhang, Z.T. Song, B. Liu, S.L. Feng and Z. Zhang	44
Structures and Electronic Properties of a Si₅₅ Cluster on DFTB Calculations L.J. Wu, L. Zhang and Y. Qi	49
Surface Plasmon Enhanced Photoluminescence of the Rubrene Film by Silver Nanoparticles L. Chen, J.X. Deng, M. Cui, K. Le, R.G. Chen and Z.J. Zhang	54
Development of Precious Metal and its Alloy Sputtering Targets with High Performance J.J. He, S.Q. Liu, J.F. Luo, Y. Wang, Y. Gao and X.D. Xiong	61
Rheological and Thermomechanical Properties of Meso and Non-Porous Silica Filled Epoxy Composites G. Li, P.L. Zhu, T. Zhao, R. Sun and D. Lu	67
Study of Black Center in Silicon Wafer for Solar Cell L. Qiao, Y.J. Wang, X.N. Zhang, Z. Liu, J. Liu, Z.Y. Wang and H.P. Shen	72
Impurity Detection Method for High-Purity BCl₃ Y.N. Shi, K. Pei, Y.F. Zhao, Y. Tan, Z. Tai, L. Zhang and Y.Q. Ji	76
First-Principles Study on Electronic and Optical Properties of Kesterite and Stannite Cu₂ZnSnS₄ Photovoltaic Absorbers L. Kong and J.X. Deng	80
Effect of Acetic Acid/Water Ratio on the Microstructure and Properties of LaNiO₃ Thin Films by Metal Organic Solution Deposition Y.Y. Zhang, X.D. Tang, G.S. Wang and X.L. Dong	89

Symposium F: Electronic Materials

Effects of Cobalt Nanoparticles Addition on Shear Strength, Wettability and Interfacial Intermetallic Growth of Sn–3.0Ag–0.5Cu Solder during Thermal Cycling Y. Gu, Y. Liu, X.C. Zhao, S.L. Wen, H. Li and Y. Wang	97
Nickel Nanoparticles Mediated Growth of the Intermetallic Compound between Sn-1.0Ag-Xni Solders Alloy and Cu Substrate X.C. Zhang, J.W. Cheng, B. Zheng, X.C. Zhao, Y. Liu and P. Chen	103

Effect of Bi Addition on Microstructures, Properties and Interfacial Intermetallic Compound Growth of Low-Ag Sn-Cu Lead-Free Solder	
Y. Wang, X.C. Zhao, Y. Liu, J.W. Cheng, H. Li and X.C. Xie	109
Influence of Dislocation Density on Micromechanical Characteristics of Cu_6Sn_5 and Cu_3Sn	
Y.K. Wang, W.S. Liu, Y.Z. Ma, Y.F. Huang and Y. Tang	115
Microstructure and Dielectric Properties of (Ba, Ta) Co-Doped $\text{Sr}_2\text{Nb}_2\text{O}_7$ Ceramics	
G. Chen, C.W. Gong, C.L. Fu, X.D. Peng, W. Cai, R.L. Gao and X.L. Deng	125
Effect of Ag Addition on Growth of the Interfacial Intermetallic Compounds between Sn-0.7Cu Solder and Cu Substrate	
X.C. Xie, X.C. Zhao, Y. Liu, J.W. Cheng, B. Zheng and Y. Gu	129
Ferroelectric and Photovoltaic Properties of Mn-Doped Bismuth Ferrite Thin Films	
W. Cai, C.L. Fu, R.L. Gao, W.H. Jiang, X.L. Deng and G. Chen	135
Magnetic Properties and Unusual Morphologies of Barium Ferrites Prepared by Electrospinning and Sol-Gel Auto-Combustion Method	
G.F. Liu, R.H. Fan, K.L. Yan, X.A. Wang, K. Sun, C.B. Cheng and Q. Hou	141

Symposium G: Multiferroic Materials

Effects of Sm and Mn Co-Doping on Structural and Optical Properties of BiFeO_3 Thin Films Prepared by Sol-Gel Technique	
W.L. Zhou, H.M. Deng, J. He, J. Liu, H.Y. Cao, X.Z. Zhai, P.X. Yang and J.H. Chu	149
Effects of Ba and Ti Codoping on Stoichiometric and Nonstoichiometric BiFeO_3 Multiferroic Ceramics	
X. Zhou, Y. Xiong, Y.C. Pei and W.P. Chen	154
A Review on the Characteristics of the New Multiferroic Three-Ply Structure Ferroelectric-Ferromagnetic Nanocomposite	
H.F. Zhang, C.L. Mak, Y. Wang, L.B. Kong and H.L.W. Chan	159
Preparation of LSMO/PLZT Composite Film by Sol-Gel Technique and its Ferroelectric and Ferromagnetic Properties	
Z.F. Duan, J.N. Wei, Y. Cui and G.Y. Zhao	166
Microstructure and Properties of A-Site Doping $\text{Bi}_{4-x}\text{Y}_x\text{Ti}_3\text{O}_{12}$ Ferroelectric Thin Films	
H.C. Liu, W.J. Zhang, X.C. Zhang, Q. Yu and J. Wang	171
Enhancement of Oxygen Vacancies Induced Photovoltaic Effects in $\text{Bi}_{0.9}\text{La}_{0.1}\text{FeO}_3$ Thin Films	
R.L. Gao, C.L. Fu, W. Cai, G. Chen, X.L. Deng, H.W. Yang, J.R. Sun and B.G. Shen	176
Investigation of the Electronic Structure of BiFeO_3 Epitaxial Films by Polarized X-Ray Absorption Spectroscopy	
H.B. Wang, Z.L. Luo, Y.Q. Dong, Z.L. Zhao, Y.J. Yang, Z.H. Chen, M.M. Yang, S.X. Hu, L. Chen and C. Gao	183
Effect of Mn Substitution on Microstructures, Dielectric and Magnetic Properties of BiFeO_3 Ceramics	
X.L. Deng, W. Cai, C.L. Fu, Y.Q. Zhang, R.L. Gao, G. Chen and J.M. Huang	188
Influence of Permeability and D_{33} on Fega/PZT/Fega Magnetoelectric Effect	
J.X. Shi and J. Zhu	194
Synchronous Characterization of Self-Bias Magnetoelectric Composite Materials	
Z. Shi, S.W. Deng, X.F. Li, S.Y. Yang, Y. Lu, C.P. Wang and X.J. Liu	199

Symposium H: Smart Materials

Disperse SiO_2 Nanoparticles in Nonaqueous Solvents by Shear Emulsification and Surface Functionalization	
C. Wang, X.Y. Li, Q. Luo, F. Ji, S.R. Hu, Q.L. Wei, W. Gao, W. Huang, G.P. Tang and J.G. He	207
Fabrication and Property of W/TinInb Shape Memory Alloy Laminated Composite	
Y. Shao, D.Q. Jiang, F.M. Guo, Y.D. Ru, X.W. Hu and L.S. Cui	211
Preparation and Properties of Nano-Crystalline Cellulose Electro-Rheological Fluid	
L.L. Xu, X.L. Shi and Q.L. Wang	217

Microstructure, Phase Transformation and Mechanical Property of Ni-Co-Mn-In Alloy Prepared by Spark Plasma Sintering	
B. Tian, D.C. Ren, Y.X. Tong, F. Chen, L. Li and Y.F. Zheng	222
Effect of Thickness on Mechanically Tunable Magnetic Anisotropy of FeGa Thin Films Deposited on Flexible Substrates	
Y. Yu, S.H. Xie and Q.F. Zhan	227
Advances on FeCuNbSiB Nanocrystalline Soft Magnetic Powder Cores	
W. Lv	233

Symposium I: Vanadium-Titanium and Rare Earth Functional Materials

Preparation and Characterization of Mesoporous Sulfated TiO₂-Graphene Oxide Composites	
Q. Lai, S.F. Zhu, X.P. Luo and X.P. Fan	241
Features of Different Types of V-Ti Iron Concentrate Powder and their Influences on the Properties of Cold-Bonded Iron Ore Pellets	
L. Ma, S.L. Yang and J.T. Zhao	248
Study on Direct Reduction of Vanadium Slag	
N.W. Wang, G.W. Li and M.X. Fang	254
Characterization of Hot Deformation Behavior of TC18 Titanium Alloy	
Q.C. Yang, K.H. Qiu, R.G. Jiang, D.M. Huang and H.L. He	263
Effects of Electroless Nickel on Hydrogen Absorption Properties of Zr-V-Fe Powders	
H. Cui, J.D. Cui, Y.H. Xu, H. Zhou and J. Du	268
Preparation and Magnetic Properties of Nanocrystal Bulk SmCo₇ Magnets	
Q. Shen, Y.L. Ma, J. Dong and D.M. Chen	276
Study on the Magnetic Properties and Microstructure of Single-Stage Hot-Deformed Nd-Fe-B Magnets	
Y.L. Ma, Q. Shen, A.R. Zhou, J.C. Sun, C.H. Li and D.M. Chen	281
Preparation of the Nanoceria Powder from Bastnasite	
Q. Feng, K.H. Qiu, S.Z. Chen and G.Y. Yan	287
Effect of V(C,N) Master Alloy on the Grain Size of Low Carbon High Strength Bainite Steel	
Q. Lyu, H.Y. Wen, Z.H. Tang, Q. Hu and B. Cheng	292
Effect of Sintering Temperature on Microstructure and Mechanical Properties of Ti Mo Alloys	
X.P. Fan, B.J. Wang, X.Q. Ren and F.C. Peng	297
Synthesis and Photoluminescence Property of Ca₃Y_{2-x}Sm_xWO₉ Phosphors	
J.J. Ru, M.Z. Zhou, B. Zhao, G.Y. Yan and S.M. Ying	301
Luminescence Properties of Phosphor (Sr_{1-x}Ba_x)_{1.95} SiO₄: 0.05Eu²⁺	
Z.X. Jiang, K.H. Qiu, X.G. Lu, K. Zhao and X. He	304
Synthesis and Luminescent Properties of Ca₂Li₂BiV₃O₁₂:Eu³⁺ Phosphor	
S.Z. Chen, K.H. Qiu, G.Y. Yan, Z.X. Jiang and C. Zhao	309
Effect of Surfactants on Morphology and Luminescent Properties of YAG:Ce Phosphors	
J.M. Zhu, Z.M. Wang, S. Tao and Y. Peng	313

Symposium J: Biomedical Materials

Titanium Foams Prepared by Using Carbamide as Spacer for Cortical Bone Implant	
J. Xiao, Y.L. Liao and G.B. Qiu	321
Preparation and Mechanical and Optical Properties of SF/Pyrrolidone Blend Film	
J.J. Li, S.S. Zhang, X.Y. Zhang and S.Z. Lu	327
<i>In Vitro</i> Controlled Release of Topically Applied Capsaicin from Silk Hydrogel: A Study Contributed to the Pain Relief System	
R. Jiang, F. Zhang, Z.P. Yin and S.Z. Lu	332
Dental Resin Composites with Enhanced Properties Bycommercial Silica Particles as Fillers	
S. Bao, R.L. Wang, B. Sun, X.Z. Jiang and M.F. Zhu	336

Novel Enhanced Acrylic Denture Base Powder by Incorporating with PMMA-Modified Ag/NaZr₂(PO₄)₃ through <i>In Situ</i> Suspension Polymerization J.J. Du, H. Yu and M.F. Zhu	342
Investigation of Zirconia/Polyacrylamide (ZrO₂/PAAm) Based Nanocomposite Hydrogels with Enhanced X-Ray Radiopacity W.J. Li, W.J. Ma, Z.Q. Meng, M.G. Xia, X.F. Wang and M.F. Zhu	348
Fabrication and Compressive Properties of Porous Ti6Al4V Alloy with Elongated Pores for Biomedical Application F.P. Li, J.S. Li, G.J. Liu, H.C. Kou, G.S. Xu and L. Zhou	354
Synthesis and Self-Assembly of Well-Defined pH-Responsive Block Glycopolymers Q.Y. Yu, L.B. Lin, X.Y. Xing, H.L. Dong, X.Z. Jiang and M.F. Zhu	359
Fabrication and Biological Properties of Bionic Structure Porous Alumina Ceramics with Spherical/Lamellar Pores Y.F. Tang, Q. Miao, Y. Liu, Z.X. Wu, W. Zhang and K. Zhao	367
Effects of Niobium Oxide Addition on the Mechanical Properties of Glass Ionomer Cement S.Q. Li, B.H. Su, J.G. Ran, J. Wang, L.L. Yan and X.M. Tu	373
Controlling Pore Size of Tissue Engineering Scaffolds Fabricated by Electrospinning and Phase Separation Y. Zhou, Q.L. Zhao and M. Wang	379
Controlled Release of Growth Factors from Tissue Engineering Scaffolds Made by Positive and Negative Voltage Electrospinning Q.L. Zhao, Y. Zhou and M. Wang	385
Cytocompatibility of Fe-O Thin Film Prepared by Unbalanced Magnetron Sputtering Y.Q. Liu, H. Sun, X. Li and N. Huang	390
Particle Size of 45S5 Bioactive Glass Affected the Enamel Remineralization Z.H. Dong and C.C. Zhou	396
Fabrication and Characteristics of Gene-Delivering Nanodevices Based on Au-Ag@CS-FA Hybrid Particles Q.W. Guan and M. Wang	401
Excellent Cell Compatibility in Time Controlled Silk Fibroin Hydrogels F. Zhang, J.J. Li, R. Jiang, S.S. Zhang, T. Zhu and S.Z. Lu	407
Matrix Elasticity Affects Integrin Expression in Human Umbilical Cord-Derived Mesenchymal Stem Cells H.W. Lv, Y. Zhang, M.Y. Sun, J.H. Yang, Z.S. Chen, M.M. Fan, L.S. Li and Y.L. Li	412
Corneal Matrix Repair Carrier with Composite Silk Protein Membrane S.S. Zhang, J.J. Li, X.F. Zhang and S.Z. Lu	424
Preparation of Collagen/Hydroxyapatite Composite Coating on Porous Titanium Substrate and its Cellular Response T. Li, J.S. Li, H.C. Kou, F.P. Li and T.L. Lu	429
One-Step Synthesis of Water-Soluble Fluorescent Carbon Dots F. Li, C.J. Liu, J. Yang, F. Tian, R.X. Li and L. Zhang	434
Structure Changes of Coating on NiTi Alloy Prepared by Micro-Arc Oxidation in Na₂SiO₃ Electrolyte D.W. Feng and X.Y. Jiang	440
Titanium Nitride Modified by Hydrothermal Treatment in Calcium Acetate Solution X.L. Shi, L.L. Xu, G.H. Zhou and L.T. Bang	446
Effect of Sericin Concentration on the Growth and Morphology of Escherichi Coli R. Xue, B.J. Chen, X. Jin, Q.S. Zhang, M.L. Han and C.C. Liang	451
Chirality Synthesis of N-Shaped ZnO Nanorods by Glacial Acetic Acid Assisted Annealing Process and Ethanol Sensing Properties Z. Yang, Q.H. Liu, T.H. Wang and Y.B. Wang	458
Synthesis and Characterization of Optical Active PLA Degradable Materials X.P. Zhao, T. Wu, Q. Lin, F. Jin, R.Z. Li and S.X. Peng	464
Phase Compositions of a Mg-Dy-Zn Alloy Containing LPSO Structures X.C. Cai, Q.M. Peng and D.Q. Fang	470

Symposium K: High Performance and Functional Polymer and Composite Materials

Synthesis and Characterization of Polythiophene Derivatives with Different Alkyl Substitution Groups W.X. Chen, Y.Q. Gu, C.Y. Luo and X.L. Zhang	477
Microwave Absorption Properties of Solid-State Polymerization Ethylenedioxythiophene Z.H. Xu, M.X. Sui, M.X. Sun, Y. Wang and M.Y. Wang	483
Surface Modified UHMWPE Particles by Direct Fluorination Blended with Polyurethane for Enhancing its Wear-Resistant Performance B.Y. Li, C. Fan, M.M. Ren, P. Wu, L.B. Luo, X. Wang and X.Y. Liu	489
Preparation and Mechanical Properties of Poly (arylene sulfide sulfone)/Glass Fiber Cloth Composites Y. Kong, J.C. Yang, X.J. Wang, G. Zhang, S.R. Long and J. Yang	496
Mechanical and Thermomechanical Properties of Nylon6T/66/PPS Blends Q. Zhang, X.L. Luo, M.L. Zhang, X.J. Wang, G. Zhang, S.R. Long and J. Yang	503
Effects of the Coupling Agent on the Mechanical Properties of Long Glass Fiber Reinforced Polyphenylene Sulfide Composites Z. Liu, Y.Q. Wu, X.J. Wang, S.R. Long and J. Yang	509
Structural Evolution and Mechanical Properties of Copolyamide Fibers during Thermal Annealing K. Li, L.B. Luo, J.Y. Huang, J. Yao, H.N. Wang, Y. Feng and X.Y. Liu	515
Improvement of Mechanical Properties of Polyphenylene Sulfide/Carbon Fiber Composites Modified by Aminated Reinforcement R. Hong, K. Zhang, B.Y. Liu, G. Zhang, X.J. Wang, S.R. Long and J. Yang	523
Solvent-Induced Crystallization of Polyarylene Sulfide Sulfone S.Y. Li, Y.W. Gong, S.R. Long, X.J. Wang and J. Yang	529
Microstructure and Thermal Properties of PET/POSS Composites Prepared by <i>In Situ</i> Polymerization W. Liu, S.X. Wang, J.M. Dai and G. Li	534
L-Lysine-Based Dendritic Gelator Modified PMMA Nanocomposite F. Ye, G.D. Tang, S. Chen, B.Z. Wu, M. Ma, Y.Q. Shi and X. Wang	539
Effect of Orotic Acid on the Stabilization Efficiency of Ca-Zn Thermal Stabilizers for Poly(vinyl chloride) X.P. Xu, S. Chen, Y.Q. Shi, B.Z. Wu, M. Ma and X. Wang	545
Synthesis of Two-Component Dendritic Gelators and their Self-Assembly Behavior in MMA F. Ye, S. Chen, G.D. Tang, B.Z. Wu, M. Ma, Y.Q. Shi and X. Wang	551
Promoted Chain Diffusion of UHMWPE/HDPE Blend by High Temperature Treatment C.H. Fan, H.Z. Kong, A.Z. Xie and B.H. Xie	557
Polymerization of Dicyclopentadiene/Styrene in PolyHIPE W.F. Xu, F.M. Sun, J.B. Liu, X.F. Li and F.A. Zhang	562
Investigation of Mechanical Properties and Dye Adsorption Capacities of Novel Hydrophobic Association Nanocomposite Hydrogels W. Cui, T. Li, H. Li, L.M. Zhu, H. Liu and R. Ran	568
Crosslinking of Polyamide 6 by Reactive Processing T. Yu, J.S. Chen, F.M. Wu and J. Rocks	576
Uniformly Dispersed Poly(ethylene glycol) Functionalized Graphene Oxide/Poly(L-lactic acid) Nanocomposites with Balanced Mechanical Properties Z.J. Zhang, Y.N. Zhou, H. Liu, L.M. Zhu, Z.M. Li and R. Ran	583
Study on Synthesis of IPDI-Based Waterborne Polyurethane L.L. Zheng and L. Chen	589
Synthesis, Characterization and Performance of Superplasticizer with a Multi-Arm Structure X. Liu, Z.M. Wang, J. Zhu, M. Zhao and Y.S. Zheng	594
Effect of Plasticizer (DOP) on Cell Structure and Mechanical Properties of Extrusion-Foamed PVC Sheet M.Y. Wang, N.Q. Zhou and J. Hu	601

Negative Permittivity of CNTs–Epoxy Composites Prepared by Cryomilling Q. Hou, R.H. Fan, Z.D. Zhang, K.L. Yan, C.B. Cheng, M. Chen, K. Sun, X.A. Wang and Q.Q. Li	607
Graphene–Epoxy Composites with High Dielectric Constant Prepared by Cryomilling Q. Hou, R.H. Fan, Z.D. Zhang, K.L. Yan, C.B. Cheng, M. Chen, K. Sun, G.F. Liu and P.T. Xie	611
Preparation of an Ultra-Thin, Highly Filled, Neutron-Shielding Material X.P. Hou, S.F. Li, Y. Chen, D. Xu and W. Tang	616
Tensile Strength of Surface Treated PBO Fiber G. Shi, S. Ju, C.F. Huang, D.Z. Jiang and J.W. Zhang	622
Super Hydrophobic Properties of Papers Prepared from Multi-Walled Carbon Nanotubes Functionalized with Polybenzimidazole and AgNPs Y.L. Zhang, Z.M. Hu and Y. Wang	629
Electroless Copper Plating on Polyester Fabric Modified with Silane through Supercritical Carbon Dioxide Process R.H. Guo, W.Q. Yan and J.W. Lan	634
Progress in Preparation of Phenolic Fibers by Electrospinning G. Xie, Y. Liu, H. He and K.J. Wang	638
Effect of Heat Setting Methods on Structures and Properties of High Strength Polyvinyl Alcohol Fibre Y. Zhu and J.X. Zhao	643
Infrared Spectral Characteristics of Azobenzene Containing Side-Chain Liquid Crystal Polymer W.X. Chen, X.L. Zhang, C.Y. Luo, A.J. Ma and Y.Q. Gu	649
Microstructure Evolution of PtTi_{0.5}Zr_{0.2}/Ti Laminated Composites Synthesized by Hot Pressing and Rolling Y. Fan, X.G. Zhang, Q. Zhao, G.Y. Qin, S.Y. Xu and J.X. Guo	656
A Very Thin Layer of NiO, Ni(OH)₂ Nanosheets Arrays with Organic Functional Modification of Polyaniline X.C. He, Z.M. Si, D.M. Li, B. Zhang, M.J. Gao, X.F. Ma and G. Li	661
Synthesis of Polythiophene Derivatives with Schiff Base Groups and Use as an Active Layer in Polymer Solar Cell Devices W.X. Chen, P. Chui, A.J. Ma, C.Y. Luo, Y.Q. Gu and Q.Y. Mi	668
Functionalization of Smart Gels with Beta-Cyclodextrin and Release Characteristics to Simulating Drugs M.J. Gao, J.L. Wang, Q. Cong, B. Zhang, X.C. He, X.F. Ma and G. Li	675
Fabrication and Evaluation of an Amino Modified Epoxy Coating for Anti-Scouring and Anti-Corrosion Application Z.D. Wang, J. Li, Z.W. Guan, Y.Z. Zhang, Y. Wang and Z.Y. Wang	684
An Organic Double-Layer Coating on Aluminum and Steel Substrates for Anti-Laser Protection Z.W. Guan, J. Li, T. Zhang, Y.Z. Zhang, P.R. Liu and Z.Y. Wang	690
Research and Development in Electrospinning Theory and Technology Q.S. Song, Y.X. Liu, Y.C. Zhang and Y. Liu	695