

Table of Contents

Preface

Symposium E: Materials in Microelectronic and Optoelectronic Industry

Process Control of Buried Layer Epitaxy by Barrel Type Furnace	3
Y.H. Wang, J.J. Zhao, H. Luo and L.B. Ma	
Ru Thin Film Formation Using Oxygen Plasma Enhanced ALD and Rapid Thermal Processing	8
C.M. Zhang, X.Y. Liu, L.Q. Zhang, H.L. Lu, P.F. Wang and D.W. Zhang	
Research on Surface Roughness of Acid Etched Silicon Wafers	14
B.L. You, X.N. Zhang, C. Luo, X.K. Sun, K.F. Wu, S. Feng and L.H. Zhang	
Investigation of Chemical Vapor Deposited Graphene Film on Oxide Substrate	18
T. Huang, L. Chen, Q.Q. Sun, P. Zhou and D.W. Zhang	
Ultrahigh Purity Copper Alloy Target Used Innanoscale ULSI Interconnects	22
H. Zeng, C. Lv, Y. Gao, T.Y. Dong, Y.H. Wang and X.Q. Wang	
Property of an AlGaN/GaN MIS Diode with $\text{Si}_3\text{N}_4/\text{Al}_2\text{O}_3$ Bilayer Gate Dielectric Films	30
L.Y. Shen, X.H. Cheng, Z.J. Wang, D. Cao, L. Zheng, C. Xia and Y.H. Yu	
A New Type of Self-Aligned Technology for RF and Microwave Graphene Field-Effect Transistors	36
Y. Wu, Z.F. Ma, L. Du, P. Zhang and L. He	
Electron Beam Annealing for Component Optimization in Si-Sb-Te Material	44
Y. Cheng, S.N. Song, Z.H. Zhang, Z.T. Song, B. Liu, S.L. Feng and Z. Zhang	
Structures and Electronic Properties of a Si_{55} Cluster on DFTB Calculations	49
L.J. Wu, L. Zhang and Y. Qi	
Surface Plasmon Enhanced Photoluminescence of the Rubrene Film by Silver Nanoparticles	54
L. Chen, J.X. Deng, M. Cui, K. Le, R.G. Chen and Z.J. Zhang	
Development of Precious Metal and its Alloy Sputtering Targets with High Performance	61
J.J. He, S.Q. Liu, J.F. Luo, Y. Wang, Y. Gao and X.D. Xiong	
Rheological and Thermomechanical Properties of Meso and Non-Porous Silica Filled Epoxy Composites	67
G. Li, P.L. Zhu, T. Zhao, R. Sun and D. Lu	
Study of Black Center in Silicon Wafer for Solar Cell	72
L. Qiao, Y.J. Wang, X.N. Zhang, Z. Liu, J. Liu, Z.Y. Wang and H.P. Shen	
Impurity Detection Method for High-Purity BCl_3	76
Y.N. Shi, K. Pei, Y.F. Zhao, Y. Tan, Z. Tai, L. Zhang and Y.Q. Ji	
First-Principles Study on Electronic and Optical Properties of Kesterite and Stannite $\text{Cu}_2\text{ZnSnS}_4$ Photovoltaic Absorbers	80
L. Kong and J.X. Deng	
Effect of Acetic Acid/Water Ratio on the Microstructure and Properties of LaNiO_3 Thin Films by Metal Organic Solution Deposition	89
Y.Y. Zhang, X.D. Tang, G.S. Wang and X.L. Dong	

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	97
Y. Gu, Y. Liu, X.C. Zhao, S.L. Wen, H. Li and Y. Wang	
Nickel Nanoparticles Mediated Growth of the Intermetallic Compound between Sn-1.0Ag-Xni Solders Alloy and Cu Substrate	103
X.C. Zhang, J.W. Cheng, B. Zheng, X.C. Zhao, Y. Liu and P. Chen	

Effect of Bi Addition on Microstructures, Properties and Interfacial Intermetallic Compound Growth of Low-Ag Sn-Cu Lead-Free Solder	109
Y. Wang, X.C. Zhao, Y. Liu, J.W. Cheng, H. Li and X.C. Xie	
Influence of Dislocation Density on Micromechanical Characteristics of Cu₆Sn₅ and Cu₃Sn	115
Y.K. Wang, W.S. Liu, Y.Z. Ma, Y.F. Huang and Y. Tang	
Microstructure and Dielectric Properties of (Ba, Ta) Co-Doped Sr₂Nb₂O₇ Ceramics	125
G. Chen, C.W. Gong, C.L. Fu, X.D. Peng, W. Cai, R.L. Gao and X.L. Deng	
Effect of Ag Addition on Growth of the Interfacial Intermetallic Compounds between Sn-0.7Cu Solder and Cu Substrate	129
X.C. Xie, X.C. Zhao, Y. Liu, J.W. Cheng, B. Zheng and Y. Gu	
Ferroelectric and Photovoltaic Properties of Mn-Doped Bismuth Ferrite Thin Films	135
W. Cai, C.L. Fu, R.L. Gao, W.H. Jiang, X.L. Deng and G. Chen	
Magnetic Properties and Unusual Morphologies of Barium Ferrites Prepared by Electrospinning and Sol-Gel Auto-Combustion Method	141
G.F. Liu, R.H. Fan, K.L. Yan, X.A. Wang, K. Sun, C.B. Cheng and Q. Hou	

Symposium G: Multiferroic Materials

Effects of Sm and Mn Co-Doping on Structural and Optical Properties of BiFeO₃ Thin Films Prepared by Sol-Gel Technique	149
W.L. Zhou, H.M. Deng, J. He, J. Liu, H.Y. Cao, X.Z. Zhai, P.X. Yang and J.H. Chu	
Effects of Ba and Ti Codoping on Stoichiometric and Nonstoichiometric BiFeO₃ Multiferroic Ceramics	154
X. Zhou, Y. Xiong, Y.C. Pei and W.P. Chen	
A Review on the Characteristics of the New Multiferroic Three-Ply Structure Ferroelectric-Ferromagnetic Nanocomposite	159
H.F. Zhang, C.L. Mak, Y. Wang, L.B. Kong and H.L.W. Chan	
Preparation of LSMO/PLZT Composite Film by Sol-Gel Technique and its Ferroelectric and Ferromagnetic Properties	166
Z.F. Duan, J.N. Wei, Y. Cui and G.Y. Zhao	
Microstructure and Properties of A-Site Doping Bi_{4-x}Y_xTi₃O₁₂ Ferroelectric Thin Films	171
H.C. Liu, W.J. Zhang, X.C. Zhang, Q. Yu and J. Wang	
Enhancement of Oxygen Vacancies Induced Photovoltaic Effects in Bi_{0.9}La_{0.1}FeO₃ Thin Films	176
R.L. Gao, C.L. Fu, W. Cai, G. Chen, X.L. Deng, H.W. Yang, J.R. Sun and B.G. Shen	
Investigation of the Electronic Structure of BiFeO₃ Epitaxial Films by Polarized X-Ray Absorption Spectroscopy	183
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	
Effect of Mn Substitution on Microstructures, Dielectric and Magnetic Properties of BiFeO₃ Ceramics	188
X.L. Deng, W. Cai, C.L. Fu, Y.Q. Zhang, R.L. Gao, G. Chen and J.M. Huang	
Influence of Permeability and D₃₃ on Fega/PZT/Fega Magnetoelectric Effect	194
J.X. Shi and J. Zhu	
Synchronous Characterization of Self-Bias Magnetoelectric Composite Materials	199
Z. Shi, S.W. Deng, X.F. Li, S.Y. Yang, Y. Lu, C.P. Wang and X.J. Liu	

Symposium H: Smart Materials

Disperse SiO₂ Nanoparticles in Nonaqueous Solvents by Shear Emulsification and Surface Functionalization	207
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	
Fabrication and Property of W/Tinib Shape Memory Alloy Laminated Composite	211
Y. Shao, D.Q. Jiang, F.M. Guo, Y.D. Ru, X.W. Hu and L.S. Cui	
Preparation and Properties of Nano-Crystalline Cellulose Electro-Rheological Fluid	217
L.L. Xu, X.L. Shi and Q.L. Wang	

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

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

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	607
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	
Graphene–Epoxy Composites with High Dielectric Constant Prepared by Cryomilling	611
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	
Preparation of an Ultra-Thin, Highly Filled, Neutron-Shielding Material	616
X.P. Hou, S.F. Li, Y. Chen, D. Xu and W. Tang	
Tensile Strength of Surface Treated PBO Fiber	622
G. Shi, S. Ju, C.F. Huang, D.Z. Jiang and J.W. Zhang	
Super Hydrophobic Properties of Papers Prepared from Multi-Walled Carbon Nanotubes Functionalized with Polybenzimidazole and AgNPs	629
Y.L. Zhang, Z.M. Hu and Y. Wang	
Electroless Copper Plating on Polyester Fabric Modified with Silane through Supercritical Carbon Dioxide Process	634
R.H. Guo, W.Q. Yan and J.W. Lan	
Progress in Preparation of Phenolic Fibers by Electrospinning	638
G. Xie, Y. Liu, H. He and K.J. Wang	
Effect of Heat Setting Methods on Structures and Properties of High Strength Polyvinyl Alcohol Fibre	643
Y. Zhu and J.X. Zhao	
Infrared Spectral Characteristics of Azobenzene Containing Side-Chain Liquid Crystal Polymer	649
W.X. Chen, X.L. Zhang, C.Y. Luo, A.J. Ma and Y.Q. Gu	
Microstructure Evolution of PtTi0.5Zr0.2/Ti Laminated Composites Synthesized by Hot Pressing and Rolling	656
Y. Fan, X.G. Zhang, Q. Zhao, G.Y. Qin, S.Y. Xu and J.X. Guo	
A Very Thin Layer of NiO, Ni(OH)₂ Nanosheets Arrays with Organic Functional Modification of Polyaniline	661
X.C. He, Z.M. Si, D.M. Li, B. Zhang, M.J. Gao, X.F. Ma and G. Li	
Synthesis of Polythiophene Derivatives with Schiff Base Groups and Use as an Active Layer in Polymer Solar Cell Devices	668
W.X. Chen, P. Chui, A.J. Ma, C.Y. Luo, Y.Q. Gu and Q.Y. Mi	
Functionalization of Smart Gels with Beta-Cyclodextrin and Release Characteristics to Simulating Drugs	675
M.J. Gao, J.L. Wang, Q. Cong, B. Zhang, X.C. He, X.F. Ma and G. Li	
Fabrication and Evaluation of an Amino Modified Epoxy Coating for Anti-Scouring and Anti-Corrosion Application	684
Z.D. Wang, J. Li, Z.W. Guan, Y.Z. Zhang, Y. Wang and Z.Y. Wang	
An Organic Double-Layer Coating on Aluminum and Steel Substrates for Anti-Laser Protection	690
Z.W. Guan, J. Li, T. Zhang, Y.Z. Zhang, P.R. Liu and Z.Y. Wang	
Research and Development in Electrospinning Theory and Technology	695
Q.S. Song, Y.X. Liu, Y.C. Zhang and Y. Liu	