

Table of Contents

Preface and Committees

Chapter 1: Synthesis and Preparation

Synthesis of CdSe Quantum-Dots-Sensitized TiO₂ Nanocomposites with Visible-Light Photocatalytic Activity	
Y. Shi, J. Ke, Q.D. Zhao, X.Y. Li, N. Zheng and F.H. Xue	3
Preparation and Properties of Brij97-Based Curcumin-Encapsulated O/W Microemulsions	
Z.N. Wang, F.M. Guo, J. Lu, L. Wei, X. Liu and W. Zhou	10
Synthesis and Luminescence Properties of Pomponlike CaMoO₄:Eu³⁺ Red Phosphors by Hydrothermal Method	
X.F. Wang, X. Wang, G.H. Peng, Z.H. Liang and J.L. Wu	18
The Growth and Optical Properties of Al-Doped ZnO Nanofibers Using PVP Nanofibers as Templates by Atom Layer Deposition	
D. Fang, X. Fang, H.F. Zhao, S. Li, Z.P. Wei and X.H. Wang	23
Influences of Preparation Process on the Orientation and Properties of PZT Piezoelectric Thick Film Generation Materials	
G.Q. Yu, Y.Y. Shao, J.B. Liu, R.L. Huo, Y.L. Li and Z.X. Duan	29
Preparation of Silica Microspheres Coated by Nano-ZrO₂	
C.X. Yue, P. Ding, Y. Zhao and L.Y. Shi	36
Preparation and Photocatalytic Activity of Fe³⁺-TiO₂-CTAB Nanostructured Films	
C.X. Yue, J. Shen, P. Ding and L.F. Yao	41
One-Step Synthesis of Aqueous Graphene Dispersion Stabilized by Sodium Dodecylbenzene Sulfonate	
K. Luo, X.G. Li, H.M. Wang, P. Wang and C. Wei	46
Influence of the Reaction Temperature on Cd_{1-x}Zn_xS Thin Films with Chemical Bath Deposited	
L.M. Zhou and Y.J. Dong	52
Synthesis and Hydrogen Absorption Capacity of Multilayered SnO₂ Hollow Microspheres	
Z.Y. Wang, F.P. Wang, M.Y. Li, M.Z. Iqbal, Q.U.A. Javed, Y.Z. Lu, M. Xu and Q.S. Li	57
Preparation and Properties of Chitosan Graft Copolymer Nanoparticles Using Potassium Diperiodatonickelate	
Z.J. Liu, M.F. Zhao, Z.G. Wu and G. Han	61
Synthesis of Allyl-Functionalized Polymers via Selective Reversible Addition-Fragmentation Chain Transfer (RAFT) Polymerization	
Z.J. Liu, M.F. Zhao, Z.G. Wu and G. Han	65
Electrospinning Carboxymethyl Cellulose Lithium (CMC-Li) Nano Composite Material for High-Rate Lithium-Ion Battery	
L. Qiu, Z.Q. Shao, M.L. Liu and Y.H. Liu	69
Electrospun Cellulose Triacetate Fibers Using DMSO/Chloroform Co-Solvent System	
T. Lan, Z.Q. Shao, W.J. Wang, F.J. Wang, D.L. Zhang, J.Q. Wang, Y.H. Liu and L.L. Kong	73
Effect of Substrate's Surface Oxidation State on Optical Absorption Property of Au/Si-NPA	
X.N. Fu, K. Li, Y.W. Luo and X.J. Li	79
Influence of Surfactant on the Crystal Form and Photocatalytic Properties of Nano-TiO₂	
L.Y. Guo, Y. Li, H. Zhou, F.Y. Li, D.H. Zhou and L.Z. Yang	83
Hydrothermal Synthesis of α-Fe₂O₃ Nanocrystals as Anode Electrode Materials for Rechargeable Li-Ion Batteries	
X.M. Lou, J.L. Huang, T.P. Li, H.X. Hu and B.N. Hu	89
Spherical SrMoO₄:Eu³⁺ Phosphors Prepared by Spray Pyrolysis	
J.L. Wu, X. Wang, G.H. Peng, Z.H. Liang and X.F. Wang	93
Preparation of TiO₂/Six-Ring Rock Composite with Highly Photocatalytic Efficiency	
J. Zhou, Q.S. Li, X. Wang, W.F. Lv and H. Wei	98
The Preparation and Properties of AP-Based Nano-Limit Growth Energetic Materials	
G.P. Li, L.H. Shen, B.M. Zheng, M. Xia and Y.J. Luo	105

Character and Preparation of Nano-SiO₂/PI Composites by Sol-Gel Method	110
Z. Chen, J. Guo, H.L. Qin, H. Xie, K.J. Liu, W. Zhao and J.P. Liu	
Preparation and Study of 0.7(Mg_{0.8}Zn_{0.2})TiO₃·0.3{Ba₄Nd_{28/3}Ti₁₈O₅₄·zBi₂O₃} Microwave Dielectric Ceramics	115
X.L. Ji, C.C. Zhai and S. Zhang	
Microwave-Assisted Preparation of Nitrogen Doped Nano-TiO₂ and the Study on the Properties	123
D.H. Zhou, X. Chen, F.Y. Li, L.Y. Guo and L.Z. Yang	
Experimental Study on the Adsorption of MB on Novel Photocatalyst Yeast/ZnS Hybrid Microspheres	129
H.G. Gou, W.S. Guan, L. Yang, Z.Q. Wang and Y.Z. Zhu	
Fabrication on Hydrophobicity of the Etched Aluminium Alloy Surfaces	134
J. Li, G.H. Cao, X.M. Zhang, C.Y. Xu and Q. Li	

Chapter 2: Property Study

Spin Reorientation Transition and Magnetization Reversal Mechanism of Gd Doped FeCo High-Frequency Soft Magnetic Thin Films	141
Y.R. An, Y. Li, Z. Wang, Y.L. Zuo and L. Xi	
Dressing Field Control of Band Gap Reflection in a Homogeneous Atomic Medium	152
L. Li and Y.Y. Li	
Optical Properties of Silica Colloids Suspensions in Electric Field	158
Y.X. Luo, J.F. Zhang, A.H. Sun, C.Y. Chu, S. Zhou, J.J. Guo and G.J. Xu	
Study on the Surface Morphologies of Nickel-Phosphorus Ultra-Black Films	166
P.P. Yue, Y.Z. Jin, X.D. Hu, H.Y. Yan and G.Q. Zeng	
Rheological and Interfacial Property of Nano-Al with HTPB, GAP and PET	170
H.X. Xu, W.J. Zhou, F.Q. Zhao, W.Q. Pang, Z.H. Sun, S.Y. Xu and G.Q. Wang	
Micrographs and Optical Properties of Al-Doped ZnO Thin Films Deposited by Radio Frequency Magnetron Sputtering	176
Y.Y. Li, Z. Chen, S.L. Li, X.L. Li, G.R. Chang, J.F. Yan and K.W. Xu	
The Surface Passivation on the Optical and Surface Properties of InP	181
X. Gao, Z.P. Wei, D. Fang, H.F. Zhao, X. Fang, S.S. Tian, J.L. Tang, P. Du, X.Y. Chu, J.H. Li, F. Fang and X.H. Wang	
Kinetics and Thermodynamics of Nanostructured Mg-Based Hydrogen Storage Materials Synthesized from Metal Nanoparticles	189
H.Y. Shao and X.G. Li	
Degradation of Polymer Solar Cells Based on P3HT:PCBM System	193
H.Z. Yu	
Combustion Characteristics of Composite Solid Propellants Containing Different Coated Aluminum Nanopowders	200
E.G. Yao, F.Q. Zhao, S.Y. Xu, R.Z. Hu, H.X. Xu and H.X. Hao	
Super-Hydrophobic Properties of Unitary Structure	212
J. Li, C.Y. Xu, F. Du, X.L. Liu and H.D. Yu	
Catalytic Properties of Ni/CNTs and Ca-Promoted Ni/CNTs for Methanation Reaction of Carbon Dioxide	217
X.F. Hu, W. Yang, N. Wang, S.Z. Luo and W. Chu	
Quasi-Classical Trajectory Study of the Scalar Properties of the Reaction N^{(4)S}+H₂(v=0,1,2,3; j=0)→NH+H	227
Y.J. Yu and X.Y. Yu	
Characterizations of Novel Binuclear Transition Metal Polynitrogen Compounds: M₂(N₅)₄ (M=Co, Rh and Ir)	233
L.H. Tang, H.B. Guo, Q.S. Li, J.H. Peng, J.J. Gu and L.B. Xiao	
Thermal and Flame Retardant Properties of MWNT Reinforced Conductive PAN Film	253
Z. Chen, X. Dong, W. Zhao, K.J. Liu and J.P. Liu	
First-Principles Study on Electronic and Optical Properties in Pr-Doped Anatase TiO₂	260
H. Chen, L.F. Yao, S.L. Yang, Y.Q. Wang, X. Liang and Y. Huang	
Basicity and Crystal Phase of Mesoporous K₂O-MgO/ZrO₂-La₂O₃ Catalyst	269
Y. Su, G.J. Dong, C.Y. Wang, J.S. Gao, D.S. Ma, Z.Z. Sun and P. Wang	

Pop-In Events and Elastic Deformation of Sapphire Single Crystal during Nanoindentation	275
R. Ke, Y.M. Zhang and Y.F. Zhou	
Adsorption Behavior of Methylene Blue with Quaternary Ammonium Modified Chitosan Microspheres Resin	281
X.M. Guo, Y.F. Chen, Q.Y. Zhang, L.X. Zeng and J.W. Luo	
Experimental Research on the Magnetic Mechanisms of $Zn_{0.990}Co_{0.010}O$ Diluted Magnetic Semiconductor by Al-Doping	302
Q. Gao, X.L. Liu, Y. Qi, B.Z. Sun and L.Z. Qi	
Saturation Concentration of Gas Pollutants in Photocatalysis	306
H.Y. Xie, C.W. Ma, Z.G. Sun and G.L. Gao	
Mechanical Analysis and Identification Markings of Nanoparticle Distribution in Narrow Friction Zones	312
Y. Sun, S.Y. Jiang, W. Zhou and X.C. Lu	
Surface-Enhanced Raman Scattering for ZnO Observed in Ag@ZnO Core-Shell Heterostructures	319
X.J. Liu, M. Xu, J.L. Hu, Y. Li, Q.S. Li, Y.Z. Lu and F.P. Wang	

Chapter 3: Applications

The Synthesis of High Yield PbS Nanocrystalline and its Photovoltaic Applications	325
Y.P. Gao and D.H. Qin	
Research on Heat Transfer Characteristics of Nano-Porous Silica Aerogel Material and its Application on Mars Surface Mission	329
C.H. Li, S.C. Jiang, Z.P. Yao, S. Sheng, X.J. Jiang, B. Zhou and A. Du	
The Compensation of Y Waveguide Temperature Drifts in FOG with the Thermal Resistor	336
Y.L. Wang, L.Y. Ren, J.T. Xu, J. Liang, M.H. Kang, K.L. Ren and N.B. Shi	
CNTs Mixed into W and B by Ball-Milling Method and their Application in Delay Composition	343
S.Y. Wang, H. Ren, Q.J. Jiao and B.L. Han	
Efficient Desizing of Fabrio Using Partially Purified Thermophilic Amylase Produced by <i>T. sacchari</i> by the Utilization of Agro-Industrial Wastes	349
M.A. Khan, M.Z. Qureshi, L. Dawson, M. Rehman, A. Hayat, F. Maqbool, F. Andleeb and K. Haleem	
The Influence of Anions Additive/CeO_2 on Cabbage	354
D. Zhang, Q.S. Li, B.F. Li, W. Hong and L. Liu	
Application of Lift-Off Process in Fabricating Nanoimprint Stamp	359
Z.H. Wang, W. Liu and Q. Zuo	
Functionalized Gold Nanoparticles Coated Polymer Spheres as SERS Substrate for the Detection of TNT Explosives	366
H.X. Gu, L. Xue, Y.H. Zhang, Y.F. Zhang and L.Y. Cao	

Chapter 4: Related Topics

Comparative Studies on Enzymatic Activity of Porcine Pancreatic Lipase Immobilized onto Functionalized Rod-Like SBA-15 Mesoporous Materials with Aminopropyl and Glutaraldehyde	373
Y.J. Li, C.J. Li, Z.L. Wang and G.W. Zhou	
Research on Eliminating Cumulative Errors for Stitching Algorithm of Large Aperture Aspheric Optical Elements	377
Y.T. Zhang, X. Yang, X. Li and Y.B. Guo	