

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

Chapter 2: Property Study

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

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

Chapter 3: Applications

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

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 Y.J. Li, C.J. Li, Z.L. Wang and G.W. Zhou	373
Research on Eliminating Cumulative Errors for Stitching Algorithm of Large Aperture Aspheric Optical Elements Y.T. Zhang, X. Yang, X. Li and Y.B. Guo	377