

# Table of Contents

## Preface

## Chapter 1: Powder Synthesis and Characterization

<b>Influence of Sulfate Ion on Phase and Dispersion of <math>\text{Y}_3\text{Al}_5\text{O}_{12}</math> Nanopowders with the Co-Crystallization Method</b>	
M.M. Hao, Z.Q. Zeng, G.F. Fan, X.H. Wang, W.Z. Lu and F. Liang	3
<b>Effect of Ammonia on <math>\text{CeO}_2</math> Microspheres Prepared by Internal Gelation Process</b>	
X.Q. Ding, J.T. Ma, X.Y. Zhao, S.C. Hao, C.S. Deng and G.X. Li	9
<b>Research on the Densification Process of the Mechanically-Alloyed Amorphous 2Si-B-3C-N Powder</b>	
P.F. Zhang, D.C. Jia, B. Yang and G.X. Wang	15
<b>Preparation and Characterization of SiC Nanoparticles for ATF-FCM</b>	
Z. Chen, R.Z. Liu, J.X. Chang and M.L. Liu	22
<b>Fabrication and Characterization of <math>\text{Li}_4\text{SiO}_4</math> Ceramic Pebbles Doped with <math>\text{Y}_2\text{O}_3</math> and <math>\text{Nb}_2\text{O}_5</math></b>	
M. Wang, M.Q. Xiang and Y.C. Zhang	28
<b>Oxidation Behavior of <math>\beta</math>-Sialon Ultrafine Powders Prepared by the Combined Sol-Gel and Microwave Carbothermal Reduction Nitridation Method</b>	
F.L. Li, F. Fu, L.L. Lu, H.J. Zhang and S.W. Zhang	34
<b>Effect of the Synthesis Method on the Properties of Ultrafine YAG Powder</b>	
J.G. Song, L. Chen, C.L. Pang, J. Zhang, X.Z. Wang, Y. Liu, X.L. Zhang, S.L. Guo and M.H. Xu	40
<b>Effect of Synthetic Technology on the Properties of <math>\text{Co}_2\text{O}_3</math> Powder</b>	
G. Xiong, H.M. Sun, X. Yang, J.S. Li, M.H. Chen, J.G. Song, L. Chen, A.X. Chen and C. Yang	46
<b>Preparation of Zirconium Sol by Precipitation Method</b>	
L. Li, Y.Y. Song, G.R. Geng and F.T. Liu	52
<b>Preparation of <math>\text{Al}_2\text{O}_3</math>-SiC Composite Powder by Carbothermal Reduction of Coal Gangue and its Influence on Properties of Blast Furnace Stemming</b>	
Q. Wang, L.N. Zhang, X. Min, M.H. Fang, X.W. Wu, Y.G. Liu and Z.H. Huang	58
<b>Preparation of Spherical Silica with Controllable Size</b>	
S.L. Wang, Z. Wang, B.H. Li and M. Xu	65
<b>Fabricating Uniform Tetragonal Barium Titanate Nanocrystals via Sand Milling Assisted by an Innovative Two-Step Calcination</b>	
Q.C. Zhao, X.H. Wang, J.Y. Kim, H. Zhang, H.L. Gong, B.C. Luo and L.T. Li	71
<b>The Microstructure and Growth Behavior of <math>\text{Bi}_2\text{Fe}_4\text{O}_9</math> Superfine Particles Synthesized by Hydrothermal Method</b>	
H.P. Song, Q. Sun and Y.Y. Wang	78
<b>Preparation of <math>\beta''</math>-Alumina with <math>\eta</math> Type Nanometer Alumina Powder via Solid Phase Synthesis</b>	
C. Zhang, L. Zhang, Y.A. Chang and J.H. Liu	84

## Chapter 2: Oxide Ceramics and Composites for Structural Applications

<b>The Effect of Dispersion Method on the Mechanical Properties of Graphene Reinforced Alumina Composites</b>	
L. Wang, J.Q. Bi, W.L. Wang, X.X. Hao, X.C. Gao and W.K. Yan	93
<b>Effect of <math>\text{WO}_3</math> on the Performances of Cordierite Ceramics Synthesized by Using Kyanite as Raw Materials</b>	
M.L. Qin, X.T. Wang, Z.F. Wang, Y. Ma and H. Liu	99
<b>Improvement of Thermal Stability of <math>\text{ZrO}_2</math>-<math>\text{SiO}_2</math> Aerogel Modified by Ca(II) Cations</b>	
H.Y. Zhao, X.L. Li, J. He, Z.P. Hu and H.J. Yu	105
<b>The <i>In Situ</i> Preparation of <math>\text{MgAl}_2\text{O}_4</math>/YAG Eutectic Composites by Reaction Sintering Using Induction Heating</b>	
H. Xu, X.T. Wang, Z.F. Wang, Y. Ma and H. Liu	111

<b>Corrosion of MgAl<sub>2</sub>O<sub>4</sub> Spinel with Different Al<sub>2</sub>O<sub>3</sub> Contents in Iron-Containing Gasifier Slag</b>	118
H.G. Sun, H.X. Li and W.B. Jiao	
<b>Fabrication of MgO/Graphene Composites by Combustion Synthesis and Spark Plasma Sintering</b>	125
N. Lu, J.X. Liu, G. He and J.T. Li	
<b>Preparation and Properties of Phase Change Thermal Insulation Materials</b>	131
S.C. Zhang, W. Wu, Y.F. Chen, L.S. Tao, K. Fang and X.K. Sun	
<b>Rheological Behaviors of Calcium Aluminate Cement-Hydratable Alumina Bonded Corundum-Spinel Castables Suspensions with Different Dispersants</b>	137
M.F. Cai, Y.H. Liang, Y.C. Yin, J.H. Nie and Y.L. Guo	
<b>Potash Erosion Resistance of Chromium-Containing Materials</b>	144
Q. Luo, H.Z. Gu, A. Huang and M.J. Zhang	
<b>Preparation of Lightweight Mullite-Anorthite Refractories by Different Routes</b>	150
D.Y. Zhang, L. Qu and W.J. Yuan	
<b>Light Burning Condition of Preparing Dolomite Clinker Using Natural Dolomite</b>	156
W.N. Zhang, X.T. Wang and Z.F. Wang	
<b>Crystallization and Optical Properties of Sr<sub>3</sub>Al<sub>2</sub>O<sub>6</sub>-SrAl<sub>2</sub>O<sub>4</sub> Eutectic Glass</b>	163
J.X. Liu, N. Lu, G. He, X.Y. Li, J.Q. Li and J.T. Li	
<b>Thermal Expansion of SrZr<sub>4-x</sub>Ti<sub>x</sub>(PO<sub>4</sub>)<sub>6</sub> Ceramics</b>	169
Y. Wang, Y.Y. Song, Y.Y. Zhou, L.P. Yang and F.T. Liu	
<b>The Mechanical Properties and Thermal Resistance of Fly Ash Geopolymer Foams</b>	175
H.T. Ng, C.Y. Heah, Y.M. Liew, M.M.A.B. Abdullah and K. Hussin	
<b>Thermal Resistance of Fly Ash Geopolymers with Alumina as Additive</b>	182
Y.S. Ng, Y.M. Liew, C.Y. Heah, M.M.A.B. Abdullah and K. Hussin	
<b>Preparation and Characterization of 3Y-ZrO<sub>2</sub> Composite Ceramics</b>	189
Y.Y. Ju, X.X. Gan, J.G. Song, F. Wang, Q. Huang and C. Xiong	
<b>The Effects of Carbon Content on ZrCO Microspheres Prepared by Internal Gelation Process with Carbon Black</b>	195
X. Sun, J.T. Ma, X.Y. Zhao, S.C. Hao, C.S. Deng, Z.Q. Li and B. Liu	
<b>Toughened Laminated Alumina/Silica Ceramics Formed by Weakening Interlayer Bonded Strength</b>	200
W.B. Dong, J.P. Fan, D.H. Zhang, J.G. Zhang and J. Zhang	
<b>Preparation and Properties of C<sub>f</sub>/Mullite Composites by PIP</b>	206
Y.Y. Wang, L.P. Yang, K. Jiang and F.H. Yang	
<b>Effect of Nano-Al<sub>2</sub>O<sub>3</sub> Particles Addition on Thermal Shock Resistance of ZTA/Cordierite Composites</b>	212
H.T. Chen, Z.J. Zhang, L. Zhang, H.X. Lu, K. Gao, H.L. Wang and R. Zhang	
<b>Effect of SiC<sub>p</sub> Addition on Microstructure and Mechanical Properties of ZTA Ceramics by Microwave Sintering</b>	217
Y.Q. Chen, S. Li, W. Li, T.T. Su, B.B. Fan, H.X. Li and R. Zhang	
<b>Effect of Sintering Temperature on Properties of YAG Porous Ceramics via Atmospheric Sintering Method</b>	224
F. Wang, M.H. Xu, A.X. Chen, L.T. Liu, Z.H. Li, R.X. Deng, J.G. Song, L. Chen and C.W. Hao	
<b>The Influences of Addition of MgCO<sub>3</sub> on the Properties of the Magnesia Prepared Using Magnesite</b>	230
W.N. Zhang, L. Wang and N. Deng	
<b>Effect of Silicon Addition on the Properties of Carbon Fiber Reinforced Mullite Based Castable Composites</b>	236
O.Y. Si, Y.B. Li, S.J. Li, R.F. Xiang, Q.H. Wang and N.N. Xu	
<b>Fabrication of Porous Mullite Ceramics with Different Phase of Alumina for Insulation Materials</b>	242
H. Luo, Y.B. Li, S.J. Li, R.Y. Chen, R.F. Xiang, N.N. Xu, Q.H. Wang and O.Y. Si	
<b>Effect of Micro-Sized Alumina Powder on the Hydration Process of Calcium Aluminate Cement</b>	249
Z.F. Xia, Z.F. Wang, X.T. Wang, H. Liu and Y. Ma	
<b>Mechanical and Thermal Properties of MgAl<sub>2</sub>O<sub>4</sub>-Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub> Ceramic Composites</b>	255
J.B. Liu, Z.F. Wang, H. Liu, X.T. Wang and Y. Ma	

<b>Sintering and Crystallization of Al<sub>2</sub>O<sub>3</sub>-La<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> Eutectic Glass</b>	261
G. He, J.X. Liu, N. Lu, G.H. Liu and J.T. Li	
<b>Preparation and Performances of Geopolymer-Based Plant Fiber Composites</b>	266
S.J. Wei, J.L. Tan, W.L. Lu, L.P. Liu, S.J. Yu and G.J. Zheng	
<b>Research on the Performance of Carbon Fiber Reinforced Inorganic Polymer Composite</b>	272
X.M. Zhang, S. Li, L.F. Gao, K. Yu, Y.Y. Xiao, K.X. Dong and Q.M. Lu	
<b>Molten Salt Synthesis and Formation Mechanism of Plate-Like MgAl<sub>2</sub>O<sub>4</sub> Spinel</b>	278
X.L. Hou, J.T. Huang, Z.H. Hu, Z.J. Feng, M. Zhang, M.Q. Liu and X.B. Li	
<b>Cryomilling and Characterization of Ti/Al<sub>2</sub>O<sub>3</sub> Powders</b>	285
J.Y. Wu, Q. Liu, Z.H. Wang and Z. Wang	
<b>Densification Technique of Al<sub>2</sub>O<sub>3</sub>/Al Metal Ceramics Using Powder Metallurgy Method</b>	291
Y.Y. Ju, A.X. Chen, R.H. Wang, F. Wang, M.H. Xu, D.M. Du, J.G. Song and L. Chen	
<b>Effect of Sintering Aids Sorts on Properties of Prepared Al<sub>2</sub>O<sub>3</sub>-Al Cermet</b>	297
R.H. Wang, X.B. Bai, X.D. Jiang, D.L. Yi, F. Wang, A.X. Chen, J.G. Song and L. Chen	
<b>Effect of Molding Processing on Properties of Al<sub>2</sub>O<sub>3</sub>-Al Cermet Prepared via Powder Metallurgy Method</b>	303
R.H. Wang, X.B. Bai, X.D. Jiang, D.L. Yi, F. Wang, A.X. Chen, J.G. Song and L. Chen	

## Chapter 3: Non-Oxide Ceramics and Composites for Structural Applications

<b>Low-Temperature Sintering of Porous Silicon Carbide Ceramics with H<sub>3</sub>PO<sub>4</sub> as an Additive</b>	311
T. Gu, F. Chen, H.L. Yuan, Q. Shen and L.M. Zhang	
<b>Co-Catalyzed Si<sub>3</sub>N<sub>4</sub>/Sialon Nanofibers Reinforced SiC Refractories</b>	316
M. Zhang, J.T. Huang, X.B. Li, Z.H. Hu, M.Q. Liu and Z.J. Feng	
<b>A Mechanically-Alloyed Amorphous 2Si-B-3C-N Ceramic with a Crystallization Temperature up to 1800°C</b>	323
P.F. Zhang, D.C. Jia, B. Yang and G.X. Wang	
<b>Characterization of Fiber-Like SiCN Formed during the Nitridation of Silicon</b>	330
L. Qu, W.J. Yuan, C. Zhang and J. Li	
<b>Characterization of C<sub>f</sub>/SiC Composite Fiber Bundle Surface Based on an Optical System</b>	336
J.H. Wei, H.J. Wang and B. Lin	
<b>Joining SiC Ceramics with Ti<sub>3</sub>SiC<sub>2</sub>/Ti<sub>x</sub>C<sub>y</sub> Multi-Interlayer by Spark Plasma Sintering</b>	343
Z.Q. Wang, Q. Liu, A.K. Yang and Z.H. Zhong	
<b>Modification of the Fiber-Matrix Interface in the Carbon Fiber Reinforced ZrB<sub>2</sub>- Based Ultra-High Temperature Ceramic Composites</b>	349
Y.F. Zu, J. Li, J.X. Dai and J.J. Sha	
<b>Polymer-Derived Nano-Sized SiC-Containing ZrB<sub>2</sub> Composites: Densification, Microstructure and Flexural Strength</b>	355
S.Q. Guo	
<b>Preparation and Ablation Performance of BN Fiber Fabrics Reinforced Nitrides Composites</b>	361
X.L. Qi, M.X. Zhang, R. Li, C.L. Zhou, J.X. Tang, Z.Q. Cheng, Z.H. Wang and Z.H. Wang	
<b>The Microstructure and Shear Properties of SiC/SiC Composite Pins with Designed SiC Fiber Preform</b>	367
S.H. Liu, H.P. Qiu, L. Wang, B.Y. Zhang, M.W. Chen, W.J. Xie and Y.Y. Liang	
<b>The Matrix Cracking Stress and Residual Thermal Stress of 2D SiC/SiC Composite Fabricated by PIP Process</b>	375
H.P. Qiu, S.H. Liu, L. Wang, B.Y. Zhang, M.W. Chen, W.J. Xie and Y.Y. Liang	
<b>Synthesis of the ZrB<sub>2</sub>-SiC Ceramic from Polymeric Precursor Pyrolysis</b>	382
R. Cai, Z.K. Ma, H.P. Qiu, S.H. Liu, W.J. Xie and M.W. Chen	
<b>Thermal Expansion of Ca<sub>1-x</sub>Sr<sub>x</sub>Zr<sub>4</sub>(PO<sub>4</sub>)<sub>6</sub> Ceramics</b>	389
Y.Y. Song, Y.Y. Zhou, Y. Wang, L. Li and F.T. Liu	
<b>Quartz Fibers Reinforced SiNB Ceramic Matrix Composites Prepared by PIP</b>	395
L.F. Gao, S. Li, S.Q. Wang, K. Yu, X.M. Zhang, Y.Y. Xiao and K.X. Dong	
<b>Preparation and Performance of C/C-SiC Ceramic Matrix Composites</b>	402
F.H. Yang, Y.Y. Wang, R.X. Liu, C.L. Zhou, L.P. Yang and K. Jiang	

<b>Influence of Carbon Fiber Treatment on Flexural Properties of C/SiC Composites</b>	408
W.J. Xie, H.P. Qiu, M.W. Chen and S.H. Liu	
<b>Spark Plasma Sintering and Characterization of Mixed <i>h</i>-BN Powders with Different Grain Sizes</b>	414
F.R. Zhai, M. Lu, K. Shan, Z.Z. Yi and Z.P. Xie	
<b>Influence of Technological Conditions on the Properties of P<sub>c</sub>BN Composites Fabricated by Spark Plasma Sintering</b>	420
Y.P. Ding, M.X. Zhang, Q. Luo, C.J. Dong, J.J. Yao, Y. Wang, K. Gao and R. Zhang	
<b>Study on the Microstructure and the Machining Performance of Ti<sub>3</sub>SiC<sub>2</sub>-TiB<sub>2</sub>-TiC Composite Ceramic</b>	426
X.J. Tang, J.S. Li, F. Zhao and L. Qing	
<b>The Preparation of C<sub>f</sub>/ SiC-ZrC Composite Material by Adding SiC and ZrC Powders in Organic Precursors</b>	432
L.P. Yang, Y. Wang, K. Jiang, F.H. Yang, Y.Y. Wang, C.L. Zhou and F.T. Liu	
<b>Processing and Properties of (Zr,Hf)B<sub>2</sub>-SiC Ceramic Composites</b>	438
X.T. Zhao, H.L. Wang, G. Shao, B.B. Fan, H.X. Lu, H.L. Xu, D.L. Chen and R. Zhang	
<b>Isothermal Oxidation Resistance of Zr<sub>3</sub>[Al(Si)]<sub>4</sub>C<sub>6</sub>-Based Composite Ceramics at 1000-1300°C in Air</b>	444
L. Yu, H. Liu, K. Liang, Z.D. Zang, J.C. Shi, Y.R. Shen, Q. Tian and X.H. Wang	
<b>Preparation and Properties of NZP Family Ceramics</b>	450
H. Li, H.Z. Xu, Y.Y. Wang, C.L. Zhou, R.X. Liu and L.P. Yang	
<b>Fabrication of Dense Silica Ceramics through a Stereo Lithography-Based Additive Manufacturing</b>	456
Y.Y. Wang, L. Li, Z.Y. Wang, F.T. Liu, J.H. Zhao, P.P. Zhang and C. Lu	

## Chapter 4: Coatings and Films

<b>Preparation of Dense Al<sub>2</sub>O<sub>3</sub> Film on 8YSZ Coating by Sol-Gel Method</b>	465
M. Wang, Z.Y. Wang, Y.J. Yuan and W. Pan	
<b>Thermal Shock Resistance of Yb<sub>2</sub>SiO<sub>5</sub>/Si and Yb<sub>2</sub>Si<sub>2</sub>O<sub>7</sub>/Si Coatings Deposited on C/SiC Composites</b>	472
X. Zhong, Y.R. Niu, T. Zhu, H. Li, X.B. Zheng and J.L. Sun	
<b>Stress Evolution and Element Diffusion in Bi-Layered Yb<sub>2</sub>SiO<sub>5</sub>/Mullite Environmental Barrier Coatings under High-Temperature Molten Salt Corrosion</b>	478
H.F. Chen, Y.X. Du, J. Feng, G. Yang and Y.F. Gao	
<b>Study of Glass-Ceramic Coating on the SUS430 Stainless Steel Plate with High Temperature Oxidation Resistance</b>	487
Y.J. Huang, S.X. Wang, W.J. Wang and H.F. Lan	
<b>Thermal Shock Behavior and Bonding Strength of MoSi<sub>2</sub>-BaO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> Gradient Porous Coating with Polymethyl Methacrylate Addition for Porous Fibrous Insulations</b>	493
Y.Y. Su, X.L. Li, H.J. Tang, Z.H. Zhao and J. He	
<b>Synthesis of Boron Nitride Coating on Graphene</b>	499
G.X. Sun, J.Q. Bi, W.L. Wang, X.X. Hao, X.C. Gao, W.K. Yan and L. Wang	
<b>Deposition and Electrical Resistivity of Oxygen-Deficient Tin Oxide Films Prepared by RF Magnetron Sputtering at Different Powers</b>	504
Q. Wang, Z.J. Peng, Y. Wang and X.L. Fu	
<b>The Impedance Spectroscopy Study of the Oxides Layer in Thermal Barrier Coatings</b>	510
Z.Y. Wang, M. Wang, Y.J. Yuan and W. Pan	
<b>Ablation Behaviors of ZrC-20vol.%MoSi<sub>2</sub> Composite Coating under Different Heat Fluxes</b>	516
T. Liu, Y.R. Niu, C. Li, L.P. Huang, X.B. Zheng and C.X. Ding	
<b>Oxidation Resistance of ZrB<sub>2</sub>-SiC-WSi<sub>2</sub> Coating Prepared by Vacuum Plasma Spraying</b>	522
C. Li, Y.R. Niu, T. Liu, J. Zhao, X.B. Zheng and C.X. Ding	
<b>Preparation of YAM Coating on the ZrB<sub>2</sub> Composites and their Ablation Resistance</b>	528
S.B. Li, J.G. Song, H.Y. Ru, X.B. Bai and Z.H. Yi	
<b>Effects of Bias Voltage on Microstructure, Hardness and Bonding Strength of TiN Coating Deposited by High Power Pulsed Magnetron Sputtering</b>	534
W.J. Chang, H. Zhang, X. Xue, S. Liu, J.F. Yang, X. Zhang, L. Long and S.W. Duo	

<b>Tribological Performances of CrSiN Coatings Deposited by High Power Pulse Magnetron Sputtering</b>	W.J. Chang, H. Zhang, Y.Y. Chen, J. Li, X. Zhang, P.Z. Jiang, X.W. Fan and S.W. Duo	540
<b>Oxidation Behavior of Cr<sub>1-x</sub>Al<sub>x</sub>N Coatings Deposited by Closed Field Unbalanced Magnetron Sputtering at 800°C</b>	W.J. Chang, H. Zhang, Y.L. Wang, C.G. Luo, X.R. Li and S.W. Duo	546
<b>Microstructure and Erosion Properties of HVOF Sprayed Cermet Coatings via Different Feedstock Powders</b>	W. Fu, Q.Y. Chen, X. Chen, X.B. Bai, H.T. Wang, C. Yang, G.C. Ji and H.L. Yao	552
<b>Bonding Strength and Thermal Insulation Property of Thermal Barrier Coating with Nanometer Alumina Coated Zirconia</b>	Z.Z. Yi, M. Lu, K. Shan, N. Li, F.R. Zhai and Z.P. Xie	558
<b>Enhanced Bioactivity of Chemically Oxidation-Modified Titanium Alloys</b>	Y.M. Wang, Y.F. Song, S.L. Deng, O. Akiyoshi, G.X. Wang and Y.F. Yan	564
<b>Fabrication and Growth Mechanism of Nanoleaf Sodium Titanate Coating on High-Purity Titanium Surface</b>	Y.M. Wang, Y.F. Song, Z. Lu, G.X. Wang, Y.F. Yan, S.L. Deng, S.D. Guo and A. Osaka	570

## Chapter 5: Dielectric and Piezoelectric Ceramics

<b>Preparation and Characterization of PrAlO<sub>3</sub>-Doped 0.95MgTiO<sub>3</sub>-0.05CaTiO<sub>3</sub> Microwave Dielectric Ceramics</b>	L.Z. Xie, J.Q. Ren, Z.J. Peng and X.L. Fu	579
<b>Structural Evolution and Microwave Dielectric Properties of Ba(Co<sub>1/3</sub>(Nb<sub>1-x</sub>W<sub>5x/6</sub>)<sub>2/3</sub>)O<sub>3</sub> Ceramics</b>	Z.F. Wang, C.Y. Zhai and X.H. Wang	585
<b>Preparation, Performances and Reaction Process of NiZrNb<sub>2</sub>O<sub>8</sub> Microwave Dielectric Ceramics</b>	M.J. Wu, Y.C. Zhang, J.D. Chen and Y. Zhang	591
<b>Polarity Effect and Dielectric Breakdown of Composite Ferroelectric Films as the Dielectric for Electrowetting Systems</b>	W.Q. Wang and Y. Su	598
<b>Using Superhydrophobic SU-8 Film as the Dielectric for Electrowetting-on-Dielectric</b>	Y.H. Piao and W.Q. Wang	604
<b>Preparation of Low Dielectric Constant Porous Silicon Nitride Ceramics for Radome Application</b>	L. Li, B.X. Zhu, H.S. Wang and J. Zhang	610
<b>BaTiO<sub>3</sub>/ Teflon Nanocomposite Ferroelectric Thin Films for Low Voltage Electrowetting Systems</b>	W.Q. Wang, J.Q. Niu and Y. Su	616
<b>Topochemical Synthesis of High-Aspect-Ratio Lead-Free (K, Na)NbO<sub>3</sub> Plate-Like Structures</b>	L.Q. Cheng, M. Feng and K. Chen	622
<b>High Piezoelectric Properties and High <i>T<sub>C</sub></i> in KNN-Based Lead-Free Ceramics Sintered in Reducing Atmosphere</b>	Y.C. Zhen, Z.Y. Cen, W. Feng, X.H. Wang and L.T. Li	628
<b>Effect of Sintering Process on Microstructures and Dielectric Properties of Nb-Doped BaTiO<sub>3</sub>-(Bi<sub>0.5</sub>Na<sub>0.5</sub>)TiO<sub>3</sub> Ceramics for X9R MLCC Applications</b>	L.L. Chen, Z.B. Shen, Q.C. Zhao, Z.M. Cai, X.H. Wang and L.T. Li	634
<b>Dielectric Breakdown Strength and Microwave Dielectric Properties of Alumina Ceramics with CaO-SiO<sub>2</sub>-MgO, Yb<sub>2</sub>O<sub>3</sub> and ZrO<sub>2</sub> Additives</b>	G.F. Fan, H.Y. Deng, M.M. Hao, K. Wang, Y.S. Shi, C.H. Li and W.Z. Lu	640
<b>Preparation and Properties of Si<sub>3</sub>N<sub>4</sub>-BaTiO<sub>3</sub> Composite Ceramics</b>	P.P. Zhang, J. Man, H.S. Wang, Q.H. Wei, Y. Gai, B.X. Zhu and L. Li	646

## Chapter 6: Transparent Ceramics and Luminescent Materials

<b>Calculation of Pore Scattering in Transparent Ceramics</b>	655
Y. Hu and W. Pan	
<b>Fabrication of High Dense ZnSe Ceramic by Spark Plasma Sintering: The Effect of the Powder Process Method</b>	
J.L. Gao, P. Liu, J. Zhang, X.D. Xu and D.Y. Tang	661
<b>The Effects of Halogen Exchange on the Structural Features, Thermal Behavior and Photoluminescence of Y/Eu Layered Rare-Earth Hydroxide (LRH) Nanosheets</b>	
J.J. Huang, Q.R. Liu, R. Zhang and X.L. Wu	667
<b>Influence of Annealing Atmosphere on Microstructure and Optical Properties of ZnO Thin Films</b>	
J. Shang, L.Y. Zheng, X. Shi, J.T. Zeng and G.R. Li	673
<b>A Facile Co-Precipitation Synthesis and Luminescence Properties of Red-Emitting La<sub>2</sub>O<sub>2</sub>SO<sub>4</sub>: x%Eu<sup>3+</sup> Nanophosphors</b>	
F. Liu, J.B. Lian, G.X. Xu and N.C. Wu	679
<b>Energy Transfer and Spectroscopic Characterization of New Green Emitting Li<sub>3</sub>Ba<sub>2</sub>Gd<sub>3</sub>(WO<sub>4</sub>)<sub>8</sub>:Tb<sup>3+</sup> Phosphor</b>	
W.L. Guo, Y.T. Jiao, P.S. Wang, Q. Liu, S. Liu and F. Hou	686
<b>Preparation and Characterization of Na<sub>2</sub>O-Y<sub>2</sub>O<sub>3</sub>-P<sub>2</sub>O<sub>5</sub>-SiO<sub>2</sub> Transparent Glass Ceramics</b>	
M.J. Zhao, X.Y. Zou, Q.L. Wei, S. Meng, H.B. Zhang and C.H. Su	692
<b>Influence of Synthesis Temperature on the Properties of SnO<sub>2</sub> Thin Films via Hydrothermal Precipitation Method</b>	
Y. Liu, J. Zhang, C.L. Pang, Z.L. Wang, J.S. Li, D. Deng, J.G. Song, L. Chen and C.W. Hao	699
<b>Effect of the Adjuvants on the Properties of Superfine SnO<sub>2</sub> Powders</b>	
J.G. Song, L. Chen, X.J. Zhou, X. Yang, X.P. Lou, M.H. Chen, X.H. Lai, C. Yang and A.X. Chen	705
<b>Transparent Ultraviolet Photodetectors Based on Ga<sub>2</sub>O<sub>3</sub> Electrospun Nanowires</b>	
M. Shahid, T.J. Li, M.F. Zhang, J. Cheng, Y. Xing and W. Pan	710
<b>Effect of L-Cysteine on Photoluminescence of Zns:F Quantum Dots</b>	
X.X. Wang, S.Z. Wang, S.W. Duo, X.Y. Jiang, W.L. Li, H.S. Wu, W. Min, X.Y. Yuan and Z. Chen	716
<b>Preparation and Properties of Cr,Nd:YAG Transparent Ceramics by Slip Casting</b>	
X.J. Wan, Y.C. Zhang, M. Wang, Y. Liu and Y.S. Li	723
<b>A Comparative Study of Relative Translucency of Six All-Ceramic Restorations</b>	
M.L. Zhang, Y. Huang, R.J. Lu and B. Deng	729
<b>Synthesis and Property Investigation on the Spherical Lu<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>:Tb<sup>3+</sup> Phosphor with Green Emitting</b>	
H.D. Wang, T. Wu, J. Zhang, T. Wang and S.Q. Li	735

## Chapter 7: Materials for Energy and Environmental Applications

<b>Effect of Rare Earth Doping on Electrochemical Properties of Fe<sub>2</sub>O<sub>3</sub> Nanoparticle for Supercapacitor</b>	
W.K. Yan, J.Q. Bi and W.L. Wang	743
<b>Fabrication of YSZ/SNDC Bilayer Electrolytes by Spark Plasma Sintering</b>	
T.J. Li, M.F. Zhang, Y.J. Yuan, X.H. Zhao and W. Pan	748
<b>Preparation and Property of LSGM-Carbonate Composite Electrolyte for Low Temperature Solid Oxide Fuel Cell</b>	
X.P. Lin, H.T. Zhong, X. Chen, B. Ge and D.S. Ai	754
<b>Enhanced Ionic Conductivity in Ce<sub>0.8</sub>Gd<sub>0.2</sub>O<sub>2-δ</sub> Nanofiber: Effect of the Crystallite Size</b>	
M.F. Zhang, T.J. Li, X.H. Zhao, H.J. Zhou and W. Pan	761
<b>Electronic Structure and Transport Properties of La<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> Pyrochlore from First Principles</b>	
Z. Li and W. Pan	767
<b>On the Sol-Gel Synthesis and Structure, Electronic and Ionic Conductivities and Impedance Behavior of Y, Fe Co-Doped SrTiO<sub>3</sub> Mixed Conductor</b>	
K. Shan, F.R. Zhai, N. Li and Z.Z. Yi	774
<b>Effects of Prilling Process on the Microstructures and Electrical Properties of Lanthanum Chromite Ceramics</b>	
X.L. Yin, Q. Zhao, D.L. He and A.M. Chang	782

<b>Design and Simulation of a Novel Thermoelectric Micro-Device with Electrodeposited Bi-Te Alloys</b>	788
S. Guo, N. Su, F. Li, D.W. Liu and B. Li	
<b>Preparation and Lithium Storage Performances of Porous Co<sub>3</sub>O<sub>4</sub> Nanorods</b>	795
L. Li, Z.H. Wang and G.X. Jiang	
<b>Hydrothermal Synthesis of Fe<sub>3</sub>O<sub>4</sub>@C Spheres as Anode Material for Lithium-Ion Batteries</b>	801
L. Li, Z.H. Wang and G.X. Jiang	
<b>Fabrication of Graphitic Carbon Spheres via a Hydrothermal Carbonization Combined Catalytic Graphitization Method Using Cobalt as Catalysts</b>	807
S.S. Li, J.K. Wang, Q. Zhu, X.W. Zhao and H.J. Zhang	
<b>Effect of pH on the Properties of BiVO<sub>4</sub> by Hydrothermal Synthesis Method</b>	813
X. Liu and J.K. Li	
<b>Synthesis and Characterization of Novel Multipods-Branched Cd-Se-S Micro-/Nano-Structures</b>	819
H. Li, Y. Zhang, C.B. Wang, Z.J. Peng and X.L. Fu	
<b>Enhanced Photocatalytic Activity of Cu<sub>1.8</sub>Se/CuAgSe for Organic Pollutants under Visible and Near-Infrared Light</b>	825
L.N. Qiao, M.R. Tang, Y.Y. Gang, M.H. Xu and Y.H. Lin	
<b>Effect of Anionic Surfactant on Adsorption Properties of Nano Calcium Carbonate</b>	830
Q.L. Ren, Q. Luo and F.L. Wang	
<b>Zn-Cr Layered Double Hydroxides Composites for Methyl Orange (MO) Absorption</b>	836
T. Zhou, J.P. Ai, W.X. Liao, L.H. Cheng, Y. Zhang, R. Jiang, Z.Q. Chen and W.K. Li	
<b>The Synthesis and Application of the Hollow Mesoporous SiO<sub>2</sub>/ Dense SiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> Composite Particles</b>	842
Z.J. Ma, Q.Y. Li, K.R. Ma, S.B. Sun, Q. Wei and S.P. Cui	
<b>Synthesis and Photocatalytic Degradation Performance of g-C<sub>3</sub>N<sub>4</sub>/ CoAPO-5/rGO Ternary Composite</b>	848
L.F. Qiu, X.B. Qiu, Z.W. Zhou and S.W. Duo	
<b>A Facile Synthesis of NiFe<sub>2</sub>O<sub>4</sub> with High Specific Capacitance as Supercapacitor Electrode Material</b>	854
X.C. Gao, J.Q. Bi, W.L. Wang, G.X. Sun, X.X. Hao, W.K. Yan and L. Wang	
<b>Synthesis of La<sub>2</sub>NiO<sub>4+δ</sub> Nanofibers by Electrospinning Method and their Application</b>	859
Y. Xing, M.F. Zhang, T.J. Li and W. Pan	
<b>Preparation and Optical Properties of ZnO Nanocrystals by Chemical Bath Deposition</b>	865
R.F. Zhong, Z. Liu, L. Zhang, T.Z. Liu and S.W. Duo	
<b>Hydrothermal Method Preparation of Flower-Like Ce-Doped ZnO as an Efficient Photocatalyst</b>	872
J.P. Ai, W.X. Liao, S.S. Luo, T. Zhou, L.H. Cheng, Z.Q. Chen, Y. Chen, Y.L. Yang and W.K. Li	
<b>The Synthesis, Characterization and Visible-Light Photodegradation Performance of Graphitic Carbon Nitride Coupling with CoAPO-5</b>	878
Z.W. Zhou, L.F. Qiu, X.B. Qiu and S.W. Duo	

## Chapter 8: Ceramics-Related Materials

<b>P-Type Molecular Sieve Antibacterial Agent and Hydrothermal Control</b>	887
S.S. Gao, X.L. Wang, Y.C. Pei, X.J. Meng and N.C. Chen	
<b>Growth of Highly (110) Oriented Diamond Film by Microwave Plasma Chemical Vapor Deposition</b>	893
Y.F. Xi, J. Huang, K. Tang, X.Y. Zhou, B. Ren and L.J. Wang	
<b>The Tribological Properties of Water Lubricated Ceramics with Silica Nanoparticle Additives</b>	900
M. Ding, B. Lin, T.Y. Sui, S. Yan, J.H. Wei and A.Y. Wang	
<b>Investigation on Magnetoviscous Effects of Water-Based Magnetic Fluid</b>	906
Z.L. Zhang, N.N. Di, L. Bai, Y. Yang and D.C. Li	
<b>Preparation and Performance of Zirconia Fiber Board</b>	912
L.S. Tao, Y.F. Chen, S.C. Zhang, K.W. Deng, H.R. Sun, X.K. Sun, D.C. Yan, K. Fang and N. Li	
<b>Computer Modeling of Ceramics Sintering: Effects of Inhomogeneity on Sintering Kinetics</b>	918
W.D. Luo, H.P. Qiu and J.Z. Pan	

<b>The Study of Heating Mode of an Expansion Insulation Material</b>		
K. Fang, Y.F. Chen, S.C. Zhang, H.R. Sun, X.K. Sun, D.C. Yan and L.S. Tao		934
<b>Effect of Alkali Activator on Preparation, and Mechanical and Thermal Properties of Iron Mine Tailing-Based Lightweight Materials</b>		
S.T. Ge, Y.B. Bi, J.K. Wang, S.S. Li, G. Zhang and H.J. Zhang		940
<b>Temperature Field Simulation of TC4/SiC Bilayer in Laser Forming</b>		
N. Li, L. Gao, Z.Z. Yi, F.R. Zhai and K. Shan		946
<b>Mechanism and Technics to Produce Geographical Indication Products of Chinese Blue-and-White Porcelain</b>		
G.Q. Shao, X.B. Zhong, Y. Zhang, X.Y. Feng, C. Zhu, J.W. Mao, Z.B. Qiu, G.Z. Xie, H.B. Li, Z.C. Zhong and Y.Y. Zhong		952
<b>Effect of <math>B_4C</math> and <math>SiO_2</math> on Bond Property for Phenolic Resin-Based Adhesive</b>		
F. Zhang, C.Q. Hu, S.C. Zhang, H.R. Sun, Y. Tian, X.K. Sun, K. Fang, D.C. Yan and Y.F. Chen		959