Table of Contents

Preface

Chapter 1: Ceramic Materials and Technologies

Synthesis of Hierarchy-Structural BaTiO ₃ Powder Used for X8R Multilayer Ceramic Capacitors by Two-Step Soft Chemical Method	
J. Wang, G.J. Rong, Y. Ding, T.W. Wang and H. Yao	3
Effect of H ₃ BO ₃ Coating on the Microwave Dielectric Properties of BZN Ceramics L.S. Yang, B. Jin and X. Wang	8
Dielectric Properties and Microstructure of BaO-Nd $_2$ O $_3$ -Bi $_2$ O $_3$ -TiO $_2$ Microwave Ceramics with Li $_2$ O-B $_2$ O $_3$ -SiO $_2$	
Y.G. Zhang and X.G. Wu	12
Effect of Process on the Dielectric Properties of BaTiO ₃ -Based X9R Ceramics B.L. Zhang, B.B. Zhang, N.N. Wang and J.M. Fei	18
Improvement in the Low-Fire Dielectric Compositions with Middle Permittivity for LTCC Applications Y.G. Zhang and X.G. Wu	25
Low Temperature Sintering of Lead-Free BaTiO ₃ -Based X9R Ceramics with Bi ₂ O ₃ Dopant	23
and Assisted by LiF-CaF ₂ Flux Agent B.L. Zhang, B.B. Zhang, N.N. Wang and J. Zhang	31
Chapter 2: Material Physics and Applied Chemistry	
High Efficient Photoreduction CO_2 with H_2O on Metal Cu-Modified Graphitic Ordered Mesoporous Carbon Supported TiO_2 Catalysts under Simulated Solar C.L. Zhang, S.F. Kang, Q.Y. Zhang and X. Li	39
Processing Effect on the Compressive Strength and Bioactivity of Ti-Based Composites Produced with TiH ₂ and Calcium Phosphate E. Compilie F. Norre N. H. A. Compress V. A. Bodrigues Hagrigues and D. E. de Silve	45
E. Gemelli, F. Nery, N.H.A. Camargo, V.A. Rodrigues Henriques and D.F. da Silva	43
Rechargeable Alkali and Alkaline Earth Metal-Air Batteries – Potential and Challenges H. Cheng and K. Scott	51
Performance Improvement of Dye-Sensitized Solar Cell by Optimizing TiO ₂ -Photoanode Structure	
F. Yang, L.F. Liu, X. Wang and J.F. Kang	55
Synthesis and Luminescence Properties of $Ba_3Y_{1-x}Eu_xB_3O_9$ (0.05 $\le x \le 0.35$) under UV Excitation	(0
X.X. Li	60
Sol-Gel Synthesis and Characterization of Ultrafine ZrSiO ₄ Powder Z.Q. Li, Q. Zhen and Y.L. Wang	66
A Theoretical Formula for the Validity Limits of the Dipole Approximation for a Dielectric Mixture	
C.H. Yang, D.L. Cao and L.S. Guo	72
Calculations of Absorbed Dose in Heavy-Ion Irradiated Phase-Change Memory Cells N. Zdjelarević, L. Timotijević, R. Marić, K. Stanković and M. Vujisić	81
Simulation of Ion Beam Irradiation Effects in Perovskite Oxide Memristors I. Knežević, M. Obrenović, Z. Rajović, B. Iričanin and P. Osmokrović	89
A Fluorescence Quenching Study for the Interaction of 2,6-bis(5-(p-methylphenyl)-1- <i>H</i> -pyrazol-3-yl)pridine with Zn ²⁺ Ion Y. Pi, H. Liu and D.J. Wang	96

Chapter 3: Chemical Engineering and Technologies

Kinetics of Hydrogenolysis of Glycerol to Ethylene Glycol over Raney Ni Catalyst T. Jiang, M.X. Ren, S.S. Chen, Q. Huai, W.Y. Ying and F.H. Cao	103
Biocompatible LDH-Alginate Composites for the Adsorption of Naphthalene Anionic Dye AG 120: Influence of Alginate Concentration on the Adsorption Characteristics S. Sebastian, S. Mayadevi and S. Mandal	112
Production of High-Purity Hydrogen and Carbon Dioxide Capture by Sorption Enhanced	
WGS Reaction Process C.T. Chou, Y.J. Huang and H.S. Yang	118
Epoxidation of Palm Kernel Oil-Based Crude Oleic Acid M.J. Jalil, N. Mohamed, S.K. Jamaludin, A.M. Som and A.R. Mohamad Daud	125
Effect of Pretreatment on Adsorption of Nickel by Oil Palm Mesocarp Fiber S.N.I. Nor-Azemi, F.A. Fuadi and S.S.A. Syed-Hassan	131
Study on the Extraction of Phenolic Compounds from Model Oil by Using Ionic Liquid X.L. Zhuang, Z.Q. Li and E.Q. Wang	137
Recent Development of Biomass Fast Pyrolysis Technology and Bio-Oil Upgrading: An Overview	1.40
N.S. Ab Rasid and M. Asadullah Casification of Oil Polyn Biomess to Braduce Sympos for Electricity Concretion. Cost	142
Gasification of Oil Palm Biomass to Produce Syngas for Electricity Generation – Cost Benefit Analysis	1.40
N. Hanina and M. Asadullah Thermal Behaviour of Slurry Prepared from Clermont Bituminous Coal and Oil Palm	148
Empty Fruit Bunch Bio-Oil H. Hamdan, M.Z. Shahruddin, A.R. Mohamad Daud and S.S.A. Syed-Hassan	153
Regeneration of Activated Carbon Using Photo-Oxidation Process	
S.K. Al-Dawery Effect of Sisal Fiber Surface Treatments on Sisal Fiber Reinforced Polypropylene (PP)	159
Composites H.L. Gan, L. Tian and C.H. Yi	167
The Effect of Preparation Method of Precursor on Synthesis of BiFeO ₃ by a Hydrothermal	107
Method Y. Xiao, Z.Z. Cao, R.Y. Shao, W.Y. He, Y.F. Gao and J.R. Liu	178
Chapter 4: Nano-Materials and Technologies	
Curvature Elastic Energy Model for Carbon Nanotubes W.W. Yao	185
Micro-Structural Properties of Zinc Oxide Nano-Particles Synthesized by Bio-Polymeric	
Templates S. Mandal, D. Savio, S.J. Selvaraj, S. Natarajan and A.B. Mandal	190
Microwave Hydrothermal Synthesis of W-Doped CuS Nanoparticle W.X. Ye, Q.X. Zhu, W.Q. Xiong, J. Lei and X.H. Liao	196
The Microwave Synthesis and Photocatalytic Activity of InVO ₄ Nanocrystalline J. Lei, Q.X. Zhu, W.Q. Xiong, W.X. Ye and X.H. Liao	200
Photo-Thermal Conversion and Stability of Gold and Silver Nanostructures Y. Ni, C.X. Kan, B. Cong, J.S. Liu and H.Y. Xu	204
Chapter 5: Biomaterials	
Structural and Mechanical Properties of Poly(\varepsilon-Caprolactone) Biocomposites Reinforced with Different Silk-Fibroin Fabric Structures	
Y.M. Wu, X. Liu, J.C. Sun, L.Z. Wang, Z.S. Yao, J.J. Dong and K.Y. Sui	217
Electrospun Absorbable Polycaprolactone (PCL) Scaffolds for Medical Applications Y.C. Wang and P.H. Zhang	221
Effect of Calcium Titanate and/or Titanium-Phosphides in the Properties of Titanium Composites for Implant Materials	
E. Gemelli, P.B. da Silva Maia, F. Nery, N.H.A. Camargo, V.A.R. Henriques, J. de Jesus and P.F. Franczak	226

Rheological Behaviors of Carbonaceous Materials Suspended in Sodium Alginate Solutions H.X. Liu, Y.Q. Tan, Q.X. Zhang, X. Qin, R.R. Zheng, K.Y. Sui and Y.Z. Xia	232
Preparation and <i>In Vitro</i> Degradation of PDO Intravascular Stents with Braided Structure C.R. Wang, H.J. Xu and P.H. Zhang	238
Chapter 6: Metals and Alloy	
Strain Hardening Behaviour of Hipped and Non-Hipped Castings of Aluminium Alloy 354 Subjected to Two-Step Ageing Treatments A. Gupta, A. Eswar, G.D. Babu and M.N. Rao	249
The Change of Processing Maps in Hot Compression Procession for Ti-6.0Al-7.0Nb Biomedical Titanium Alloy Y.H. Liu, Z.K. Yao, Y.Q. Ning, H.Z. Guo and Z.L. Zhao	254
Statistical Analysis of Pit Dimensions for Pre-Corroded AA 7075-T6 Y.F. Huang, L.J. Chen and X.B. Ye	259
Feature Recognition of Corrosion Pit for Pre-Corroded AA 2524 and Statistical Analysis Z. Li and L.J. Chen	263
Precipitation Behavior of the Second Phase Particles in Grain Oriented Silicon Steel Slabs under Different Reheating Conditions X.H. Chen, C.Y. Zhu, L. Deng and G.Q. Li	268
Electrochemical Corrosion Behavior of Different Graphite Shapes Cast Irons in Acidic Solution	
Z.H. Yu, J.F. Qiang and H.L. Li	275
Chapter 7: Materials Processing in Mechanical Engineering	
The Extrusion Behavior of AZ31 Mg Alloys by Finite Element Simulation P. Li, S.R. Wang, Y. Wang and G.J. Xue	285
The Extrusion Behavior of Mg Alloys Interpenetrating with Stainless Steel Wire P. Li, S.R. Wang, Y. Wang and G.J. Xue	289
Evolution of Wear on the Abrasive Tool during the Polishing of Porcelain Tile Using Morphological Space	
F.J. Pinheiro Sousa, J. Seewig, C. Chiamulera, O.E. Alarcon and W.L. Weingärtner	293
Chapter 8: Materials of Engineering Structures	
Study of the Effect of Cement Asphalt Mortar Disease on Mechanical Properties of CRTS II Slab Ballastless Track F.S. Liu, Z.P. Zeng, B. Wu, Z.C. Zhang and K. Peng	305
Flexural Toughness of Hybrid Fiber Reinforced Concrete under Notched Beam Three-Point Bending	211
S.H. Xiong, D.T. Xia and X.K. Liu Structural Deformation and Stress Analysis of Aircraft Wing by Finite Element Method	311
M.F. Rabbey, A.M. Rumi, F.H. Nuri, H.M. Monerujjaman and M.M. Hassan	318
Research on the Longitudinal Displacement between Track Plate and Filling Layer under the Influence of Temperature Z.C. Zhang, Z.P. Zeng, F.S. Liu, Y.M. Zhang and D.P. Zeng	323
Experimental Study on Axial Tensile Strength of Low Volume Fraction of Ternary Hybrid Fiber Reinforced Concrete Y.T. Zhu, D.T. Xia and B.R. Zhou	329
· · · · · · · · · · · · · · · · · · ·	Z _ /