

Table of Contents

Preface

Chapter 1: Semiconductors and Semiconductor Structures

Enhanced Performance of the Non-Polar Ultraviolet Light-Emitting Diodes with Lattice-Matched Quaternary Quantum Barriers Q. Dai, X. Zhang, Z.L. Wu and X.H. Zeng	3
Design of Hafnium Oxide (HfO₂) Sidewall in InGaAs/InP for High-Speed Electronic Devices N. Gowthaman and V. Srivastava	10
Impact of Deep Ultraviolet-Ozone Photoactivation on Dielectric Properties of Amorphous SrTiO₃ Thin Films A. Mudhaffar and H. Al-Jawhari	17
Photo Effect Studies in Graphene/N-GaAs Schottky Junction Using NEGF Method for Photovoltaic Application M.A.U. Khan, N.O. Adesina and J. Xu	24
Reversible Poly Lactic Acid (PLA) Film for Volatile Organic Compounds (VOCs) Gas Sensor S.A. Alias and K.M.K. Ishak	32
Influence of Plasmonic Gold Nanoparticles on the Optical Properties of Oxide Glasses Doped with Rare-Earth Ions G. Shakhgildyan	38
Microstructure and Optical Properties of Zirconium Co-Doped Barium Titanate Thin Films on Quartz Substrates D.K. Sandi, Y. Iriani and D. Fasquelle	44
Class-B Power Amplifier with Si-Based Double-Gate MOSFET: A Circuit Perspective S.H. Mbonane and V. Srivastava	50

Chapter 2: Synthesis and Application of Nanomaterials

Advances and Prospects of Self-Assembly of Nanomaterials in 1D to 4D via Electrospinning Z.T. Tian	59
Effects of Nanoscale Zero-Valent Iron on Soil-Leaching of Trinitrotoluene Contaminated Soil in Acid Rain Conditions W. Kosanlavit and N. Noinumsai	66

Chapter 3: Applied Approaches of Physical Chemistry

A Novelty Analytical Approach to Determine Oxidation States in Complex Refractory Oxides Containing Iron, Uranium, Cerium and other Mixed Valence Cations K. Al Essa, K.I. Lilova, L. Zhang and A. Navrotsky	77
Study on the Growth Mechanism of Chlorocarbon Radicals on the Surface of CVD Diamond (100) X.G. Jian and J.B. Hu	83

Chapter 4: Materials for Biomedicine and Pharmacology

Inhibitory Potential of Artificial Saliva Containing Vanillin against Biofilm Formation of Candida S. Thaweboon and B. Thaweboon	91
One-Pot Synthesis of 2-Phenylquinoline-4-Carboxylic Acid: Iron(III) Trifluoromethanesulfonate Catalysed Doebner Reaction A.M. Halim, A.H. Cahyana and R.T. Yunarti	97

Research Progress in the Application of CuS Nanoparticles in Tumor Diagnosis and Treatment	
Y.F. Qu and Z.L. Wang	103

Chapter 5: Advanced Composite Materials and Structures

Protecting the Hull of High-Speed Crafts against Slamming Loads Using Hybrid Viscoelastic Layers	
P. Townsend, J.C. Suárez, A. Rodríguez-Ortiz and N. Muñoz	111
Examination of Toughening Mechanisms of Zirconia Fabricated by Spark Plasma Sintering Methods	
K. Sudo, T. Kudo and H. Tsukamoto	124
Fabrication of Metal Matrix Composites with Thermally Unstable Reinforcements by Spark Plasma Sintering	
Y. Watanabe, Y.M. Shrikrishna and H. Sato	130
Compressive Strength Experiment of Honeycomb Sandwich Composite Panel	
A. Chen, W.F. Zang and L. Li	136
Mechanical Analysis of Laminated Structures Consisting of Denim Fabric and Recycled HDPE / LDPE Bottle Caps	
I. Yalcin-Enis and H. Sezgin	142
Fabrication of Zirconia/ 304 Stainless Steel Functionally Graded Materials Using Centrifugal Slurry Methods and Spark Plasma Sintering	
K. Fukui and H. Tsukamoto	148
Processing Biodegradable Fused Filament Fabrication Waste with Micro-Silica Particles	
S. Siraj, A. Al-Marzouqi and W. Ahmed	156
Waterborne Polyurethanes for Electrical Applications as Insulators and Anti-Electrostatic	
M. Marín-Genescà and J. Garcia-Amoros	163

Chapter 6: Membranes and Membrane Technology

Nanozeolite-Impregnated Polysulfone/Polyethylene Glycol Nanocomposite Membrane for Ion Adsorption Application	
A.B.G. Deang, R.S.A. Alcantara, J.B. Bayot, N.K.D. Ledesma, V.L.J.L. Vasquez and J.C. Millare	173
Fabrication and Characterization of Cellulose Acetate/Organo-Montmorillonite Composite Membrane for Ion Adsorption	
S.C.J. Querijero, A.P.L. Melgar, M.C.A.M. Suba, M.M.G. Lagman, K.R. Bucud and J.C. Millare	179
Recent Advances and Challenges of Metal-Organic Frameworks for Ethylene/Ethane Separation	
Y.X. Cheng	186

Chapter 7: Properties and Processing Technologies of Metallic Materials

Numerical Analysis of Microstructure Anomalies during Laser Welding Nickel-Based Single-Crystal Superalloy Part II: Favorable Dendrite Tip Undercooling	
Z.G. Gao	197
Optimization Design of Cold Extrusion Process Parameters for Multi-Ribs Aluminum Alloy Part	
X.Y. Ji, W.Z. Fu, M.Z. Li, C.Y. Wang and X. Chang	209
Numerical Analysis of Microstructure Anomalies during Laser Welding Nickel-Based Single-Crystal Superalloy Part I: Salient Aluminum Redistribution Melioration	
Z.G. Gao	215
Research on the End Effect of Cylindrical Parts	
C.Y. Wang, H.B. Wang, B. Yu, X.Y. Ji, M.Z. Li and W.Z. Fu	228
A Review on Dissolvable Alloys - Part I: Development of Materials	
J.H. Xu, G.D. Zhan, A.S. Aljohar and T.E. Moellendick	234

High Throughput Calculation and Screening of High Strength and High Conductivity Cu-Cr-Sn Copper Alloy J.J. Tang, C. Liang and C.G. Xu	244
High Throughput Calculation and Characteristic Structure Selection of Cu-Cr-Sn Copper Alloy Based on Matchcloud Platform J.J. Tang, C. Liang and C.G. Xu	250

Chapter 8: Corrosion Inhibition

Comparison of the Inhibition Effect of Cedrus Atlantica and Azadirachta Indica on Low Carbon Steel Corrosion: Data and Statistical Analysis R.T. Loto, C.A. Loto and A. Busari	261
Study of the Corrosion Inhibition Reaction of Admixed Plant Distillates on Mild Steel R.T. Loto, R. Leramo, T. Olowoyo and K. Igwe	268

Chapter 9: Materials and Technologies in Construction

Effect of Elevated Temperature on the Compressive Strength of Waste Tile Aggregate Concrete C.H. Wu, J.H. Chi, M.C. Chi and C.K. Huang	279
Impact Behavior of High-Strength Engineered Cementitious Composite and Concrete Layered Slabs C. Wu, M.M. Mohammed, Y. Wang and C.C. Hou	285
Analysis and Optimization of Forming Quality of 3D Concrete Printing Materials S.P. Liu, Z.Y. Ma, W.J. Xia and Y.J. Huang	293