

# Table of Contents

<b>Preface</b>	v
<b>Committees</b>	vi
<b>Chapter 1: Natural Rubber and Rubber Composites</b>	
<b>Optimal Method of Selection of Water Lubricated Rubber Bearing Materials</b> Z. Chen, Y.G. Li and S.S. Zhang .....	3
<b>Effect of Carbon Black Substitution with Raw and Modified Bentonite on the Thermal Aging Resistance of Natural Rubber Composites</b> C.L. Garing and B.B. Pajarito .....	8
<b>Effect of Partial Replacement of Silica with Raw and Modified Bentonite on the Tensile Properties of Natural Rubber Composites</b> M.R.R. Ali and B.B. Pajarito .....	14
<b>Synthesis of Novel Cationic Waterborne Polyurethane from Natural Rubber and its Properties Testing</b> N. Sukhawipat, N. Saetung and A. Saetung.....	19
<b>Effect of Grit Type, Aging Temperature, and Aging Time on Particle Size of Ground Natural Rubber/Zeolite Composite Powder</b> K.C. Ondoy and B.B. Pajarito.....	24
<b>Water Diffusion in Natural Rubber Vulcanizates: Effect of Ingredient Loading on Swelling and Mechanical Properties</b> A.Y. Ananoria and B.B. Pajarito .....	30
<b>Correlation of Blooming and Tensile Properties in Surfactant-Loaded Natural Rubber Vulcanizates</b> B.B. Pajarito and J. Arabit .....	35
<b>Cure and Mechanical Properties of Natural Rubber Filled Bacterial Cellulose</b> C. Vudjung.....	40
<b>Compatibilization Efficiency of Polybutadiene-Grafted Maleic Anhydride in Ethylene-Propylene Diene Rubber/Epoxidized Natural Rubber Blends</b> S. Prasertsri, P. Nuinu, S. Srichan, S. Radabutra, C. Vudjung and S. Boonyod.....	45
<b>Modification of Used Palm Oil: Preliminary Study of its Potentiality as Polyurethane Foam Precursors</b> D. Riyapan, N. Saetung and A. Saetung .....	50
<b>Chapter 2: Polymers, Composites</b>	
<b>Preparation and Properties of Solid Buoyancy Materials for Deep Sea with New Unsaturated Polyesters as Matrix</b> H.Y. Li, F.F. Zhu and Y.Y. Chen .....	57
<b>The Scrutiny of the Insulation Breakdown Strength for the Nanocomposite Oxide Doped Epoxy Resin Insulator with Different Electrodes by Using Positive Impulse Voltage</b> M. Xayyavong, K. Tonmitr, N. Tonmitr and E. Kaneko .....	63

<b>Poly(Vinyl Alcohol) (Core)-Polyurethane (Shell) Nanofibers Produced by Coaxial Electrospinning</b>	
G.Y. Park, S.Y. Lee, W.J. Kim and J.H. Choi .....	68
<b>Relationship between Tensile Modulus and Oxygen Uptake of Pro-Oxidant Loaded Low-Density Polyethylene Films during Heat Aging</b>	
R.D. Maalihan and B.B. Pajarito .....	72
<b>Effect of Colorant Additive and Thickness on Tensile Properties of Oxo-Biodegradable PE Plastic Bags in Alkaline Solution</b>	
G.L.D. Leuterio and B.B. Pajarito .....	77
<b>Effect of Morphology and Chemical Modification on Water Degradation Behavior of Polyvinyl Alcohol - Gelatin Blend</b>	
J.M. Ramis and B.B. Pajarito .....	82
<b>Effects of Gamma Radiation on Thermal and Mechanical Properties of Wood-Flour Filled Polybenzoxazines</b>	
S. Tiptipakorn, K. Puengbankoh, S. Rimdusit, P. Suwanmala, K. Hemvichian and N. Matchariyakul.....	87
<b>Sorption and Degradation Behaviour of Epoxy Composites Reinforced with Amine-Coated Polyester Triangular Bars in Acid Environment</b>	
B.B. Pajarito, D.F. Dang-Awan, M.A.A. Felipe and K.C. Handa .....	93
<b>Improvement on Surface Tracking and Tensile Stress of Insulator via the Used of Aluminium Oxide Filler</b>	
N. Nilbunpot and A. Suksri.....	98
<b>Experimental Research on Bearing Strength and Effect Laws for Woven GFRP Composite Laminates</b>	
L. Liu, H.D. Li and Z.Y. Mei.....	103
<b>Repair of Flexuously Impact Damaged CFRTP Applying an Inserting Method with Tiny Melted Sheet of PP Resin Modified with Fine Glass Fibers</b>	
R. Ootani, K. Okubo and T. Fujii.....	108
<b>Experimental Study on Effect of Ceiling on Upward Flame Spread over Poly(Methyl Methacrylate) Sheets</b>	
F. Peng, L.Z. Yang and X.D. Zhou .....	114
 <b>Chapter 3: Sustainable Technologies in Chemical Engineering</b>	
<b>Parametric Study of Silica Precipitation from Geothermal Brine</b>	
D.E.O. Santiago and B.B. Pajarito .....	121
<b>Development and Application of Bamboo Activated Carbons and their Potency as Adsorbent Material for Adsorbed Natural Gas (ANG); An Overview</b>	
D.N.K. Putra Negara, T.G.T. Nindhia, I.W. Surata and M. Sucipta.....	126
 <b>Chapter 4: Materials and Technologies for Conversion, Storage and Supply of Energy</b>	
<b>Effects of Dimethoxyethane as a Co-Solvent on Electrochemical Formation of a Surface Film on Graphite in an Ethylene Carbonate-Based Solution</b>	
S.K. Jeong .....	133

<b>Flexible Interdigital In-Plane Supercapacitor Based on Laser Reduced Graphene Oxide (LRGO)</b>	
E.N. Ghoniem and A. Abd El-Moneim .....	138
<b>Solid-State Synthesis and Characterization of <math>\text{Li}_{7-3x}\text{Ga}_x\text{La}_3\text{Zr}_2\text{O}_{12}</math> Solid Electrolyte for Li-Ion Battery Application</b>	
R.L.T. Gimpaya, R.R.R. Gamboa, S.A.S. Botin and R.B.M. Cervera .....	145
<b>Characterisation of Polymer Electrolytes Based on High Molecular Weight PVC and BMIMCF<sub>3</sub>SO<sub>3</sub></b>	
N.A.S. Nik Zulkepli, W. Tan and R.H.Y. Subban .....	150
<b>Manufacturing and Macroscopic Properties of Warm Sprayed Cu-36at.%In-15at.%Ga Coating Layer</b>	
G.S. Ham, H.J. Kim, D.H. Ji and K.A. Lee .....	155
 <b>Chapter 5: Materials and Technologies for Micro- and Optoelectronics</b>	
<b><i>In Situ</i> Electrochemical Study of Copper Nanoparticles Stabilized with Food Grade Gelatin</b>	
E.M. Datu and M.D.L. Balela .....	163
<b>Design of High Speed and High Efficiency Single-Photon Detectors Using Silicon Avalanche Photodiodes</b>	
N. Zhou, M.Q. Zhuang and H. Liang.....	168
<b>Electrical Characteristics of Different Gate Geometry of FinFET</b>	
N. Patcharasardtra and W. Pengchan .....	174
<b>Calculation of the Rate of Helium Ion Dispersion in Gallium Arsenide Compound</b>	
H.F. Abdul Amir, A. Hassan, A. Alias and F.P. Chee.....	179
<b>Photoresponse of Zinc Oxide-Polyaniline Junction at Different Light Intensities</b>	
E.S. Mones, A.V. Gillado and M.U. Herrera .....	186
<b>Wettability of Selected Lead-Free Solders for Higher Application Temperatures</b>	
R. Koleňák, I. Kostolný and P. Šebo .....	190
 <b>Chapter 6: Glasses and Special Alloys</b>	
<b>Electrical and Optical Properties of Soda-Lime Glass Coated Using High Voltage Electrodeposition Technique</b>	
M.M.P. Parel, A.V. Gillado and M.U. Herrera .....	199
<b>Strong Down-Conversion Emission of <math>\text{Sm}^{3+}</math> Doped Borotellurite Glass under 480 nm Excitation Wavelength</b>	
S.N. Rafien, A. Kasim, A. Hashim, S.A. Syamsyir, M. Abdullah and M.A. Naveed .....	204
<b>Viscosity and Density of Co-B Liquid Fusions</b>	
V. Konashkov, V. Vyukhin and V. Tsepelev.....	209
<b>Effect of Mn-Content on the Deformation Behavior of Binary Ti-Mn Alloys</b>	
M.K. Gouda, K. Nakamura and M. Abdel-Hady Gepreel .....	214
<b>Thermodynamic Study on Interfacial Reaction between Molten Iron and Spinel</b>	
H. Okuno, N. Fukami and N. Shinozaki .....	219

## Chapter 7: Materials Processing Technologies

<b>Comparative Study of Drilling Induced Delamination in CFRP with Different Ply Orientation</b>	
K. Phapale, S. Patil, R. Singh and R.K.P. Singh.....	227
<b>Effect of Gas Based Coolant Lubricants on Machinability of Titanium Alloy Ti6Al4V</b>	
S. Patil, P. Pawar, S. Kekade, S. Patil, K. Gujar and R.K.P. Singh .....	233
<b>Investigation of Microstructure in Friction Stir Welded Al-Cu-Li Alloy</b>	
Y.R. Lee, K. No, J.H. Yoon, J.T. Yoo and H.S. Lee .....	240
<b>Methodology of Uniform Filling Control for Vacuum Casting</b>	
F.L. Mao, H.G. Zhang and Q.X. Hu .....	245
<b>Effect of Shielding Gas Mixture on Gas Metal Arc Welding (GMAW) of Low Carbon Steel (LR Grade A)</b>	
Y. Purwaningrum, Triyono, M. Wirawan Pu and F. Alfarizi .....	250
<b>Parametric Analysis of Cylindrical Plunge Grinding on Micro-Alloyed Steel Using Taguchi Analysis</b>	
S. Kekade, S. Patil, S. Joshi and R. Singh .....	255

## Chapter 8: Coatings, Surface Engineering, Films and Layers

<b>Time Dependent High Dimension Model of Functional Gradient Thermal Barrier Coating Material</b>	
C. Zhao, Y.G. Li and S.S. Zhang.....	263
<b>Hydrophobicity of Surfaces Coated with Functionalized Titanium Dioxide Nanoparticles</b>	
P.A.L. Sino, M.U. Herrera and M.D.L. Balela .....	268
<b>Butane/Propane Gas Sensing Using Zinc Oxide Film Grown by Successive Ionic Layer Adhesion and Reaction</b>	
E.A. Florido and S.A. Solidum .....	273
<b>Fabrication and Characterization of Ultra Water Repellent Surfaces on Aluminum Alloy Substrate</b>	
R.H. Chi, Y.F. Yu, Z.J. Yu and G.Z. Kuang.....	278
<b>Morphological Studies on Spray Deposited Lanthanum Sulphide (La<sub>2</sub>S<sub>3</sub>) Thin Films</b>	
G.D. Bagde, C.T. Londhe and A.G. Bagde.....	283

## Chapter 9: Biomaterials

<b>Bio-Electrospraying of Human Umbilical Vein Endothelial Cells with a Customized Multi-Hole Spinneret</b>	
T. Zhang, Y.Y. Liu, H.C. Yu, S. Li, H.P. Chen and Q.X. Hu .....	291
<b>Osteogenesis and Degradability of Bioresorbable Biphasic Gypsum-Carbonated Apatite Granules for Bone Tissue Engineering</b>	
S. Ibrahim, S. Abu Bakar, M.A. Ahmad, N.A. Johan, S.F. Hisham and K. Jamuna-Thevi .....	297
<b>Formation of Carbonated Apatite Layer in 1.5× Simulated Body Fluid at Different Refreshing Time</b>	
M.H. Mohd Tajudin, Z. Tapsir, L.H. Ismail and S. Saidin .....	304

***In Vitro* Bioactivity of Macroporous Calcium Phosphate Scaffold for Biomedical Application**

S. Sabudin, S. Sahid, N.S. Kader Bashah, S. Ibrahim, Z.H. Hussin and M.A. Marzuke..... 309

**Effect of Hydroxyapatite: Fibroin Ratio on Hydroxyapatite/Fibroin/Chitosan Porous Scaffold Characteristics**

W. Wattanutchariya, A. Chaijaruwanich and T. Sukhachiradet ..... 315

**Chapter 10: Building Materials****Reflections on Mechanisms Affecting the Behavior of FRP-Concrete-Steel****Double-Skin Tubular Columns**

T. Ozbakkaloglu..... 323

**Modeling the Heat of Hydration of Concrete Incorporating Fly Ash**

Z.G. Lu and X.X. Wang..... 332

**Optimization of Radiation Shielding Concrete for Radiotherapy Treatment Room at Bangabandhu Sheikh Mujib Medical University**

D. Sarker, A. Biswas, M.M. Rahman and M.M. Mehedi ..... 338

**Compressive Strength and Water Penetration of Concrete with *Enterococcus faecalis* and Calcium Lactate**

J.M. Irwan, L.H. Anneza, N. Othman and A. Faisal Alshalif..... 345

**Experimental Research on Creep Laws of High-Water Material under Real Pressure Water Environment**

H. Xie and Y. Chen..... 350

**Chapter 11: Recycling and Waste Treatment****Application of Sand Casting to Recycle Aluminum Alloy for Motorcycle Brake Handle**

I.N.G. Antara, K.G. Made and G. Ketut ..... 357

**How to Increase Plastic Waste Acceptance for Mechanical Recycling: An Introduction to Material Value Conservation and its Phenomenon**

D.S. Gabriel..... 362

**Processing Zinc from Waste of Used Zinc-Carbon Battery with Sodium Chloride (NaCl) for Biogas Desulfurizer**

T.G.T. Nindhia, I.W. Surata, I.D.G. Putra Swastika and P. Widiana ..... 368

**Precious Nickel Recovery from Palm Oil Mill Fuel Ash Waste (Ni-POMFAW) Using Acidic Leaching Extraction (ALE)**

N. Said, S.M.S. Ahmad, V.S. Malar, A.K. Syafiqah, A.M.S. Hajar and A.R. Aina..... 374

**Remediation of Raw Wastewater of Palm Oil Mill Using Activated Cow Bone Powder through Batch Adsorption**

A.R.O. Adeleke, A.A. Abdul Latiff, Z. Daud, B. Ridzuan and N.F. Mat Daud..... 380

**Visible Light Photocatalytic Activity of Zinc Oxide-Copper Oxide Composites**

D.L.V. Almanza, M.C.T. Garcia, A.D. Prodigalidad and M.U. Herrera ..... 385

**Keyword Index** ..... 391**Author Index** ..... 395