

Table of Contents

Preface

Chapter 1: Polymers and Composites

Evaluation of Cell Deformation in Functionally Graded Natural Rubber Foam via Finite Element Analysis

M.S.F. Samsudin, A. Ariffin, M.K. Abdullah and Z.M. Ariff 3

Thermoresponsive Shape Memory Polymer Based on Polylactic Acid/Styrene-Butadiene-Styrene Blends with Different Inorganic Metal Fillers

F.H.A. Rahim and A. Rusli 11

Emulsion Polymerisation of Poly(Methyl Methacrylate)-Grafted-Graphene Oxide (PMMA-GO): Effect of Surfactant Concentration on Colloidal Stabilization

M.N.A. Said, N.A. Hasbullah, M.R.H. Rosdi, A. Rusli, A. Ariffin and M.D. Shafiq 21

Boiling Temperature and Particle Size Effect on the Tensile Strength of Rice Straw-Based Biomaterials

M.P. Pinem, Y. Yusuf, N.J. Pamungkas, J. Dharmesta, K.P. Yudha, D. Satria and D. Sukamto 27

Study of Tensile and Impact Properties for 0⁰ and 45⁰ Fiber Directional Orientation of Polyester Resin Composites with Woven Ramie Reinforced

M. Jannah, S. Sunardi and Y. Dwiki 33

A Review on Oil-Soluble Polyisobutylene-Based Dispersant for Colloidal Stabilization

A.M.N.A.A. Rahman, Y.Z. Kei, A. Ariffin and M.D. Shafiq 41

Analysis of Stress Distribution of Composites Based on Hydroxyapatite by Finite Element Method

A. Pramono, A. Milandia, S. Suryana, A. Juniarah and F. Sulaiman 49

Chapter 2: Metallurgical and Mineral Extraction Processes

Effect of Temperature and Cycle Spheroidizing on Mechanical Properties and Microstructure of Low Carbon Steel

A. Alhamidi, A. Alfirano and A. Prawira 59

The Effect of Leaching Time on ZrO₂ Synthesis through Alkali Fusion and Acid Leaching

E. Yustanti, L. Artrisanti and E. Sulistiyono 65

Chapter 3: Functional Materials

Comparative Study of Optical and Chemical Properties of ZnO-Ag Composites Synthesized from Mimosa Pudica and Andrographis Paniculata Extracts

P. Raknoi, W. Chochuang and S. Sangjan 79

Effects of Electrolyte Composition on the Electrochemical Properties of an Aluminum Alloy Electrode for Al-Air Batteries

Y.W. Chung, S. Lee, W.K. Choi, C. Baeg and S.K. Jeong 89

The Effect of Electrode Voltage on Acetylene Plasma Deposition Particles during the Preparation of PECVD Carbon Film Based on PIC-MCC Simulation

J. Che, P.Y. Yi, Y.J. Deng, L.F. Peng and X.M. Lai 97

Doping Effects of Metals on Electrical Conductivity of TiO₂ from First-Principles Calculations

H. Sun, Z.T. Xu and D. Zhang 105

Chapter 4: Waste Treatment

Analysis of the Effect of an Absorbent Plate Coated with CuO Nanoparticles on Single Slope Solar Distillation

N.K. Caturwati, D.F. Yusvia, R. Fauzi and D. Sukamto 113

Chapter 5: Materials and Technologies for Radiotherapy

**a-Si EPID Modeling in GATE for Monte Carlo Investigation on the Optical Properties of
 $\text{Gd}_2\text{O}_2\text{S:Tb}$ and $\text{Lu}_2\text{SiO}_5:\text{Ce}$ Scintillators**

D.R.S. Pamisa and C.T.J. Quiñones

133

**Monte Carlo Simulation Study on the Depth-Dose Distribution of Thermoplastic Reinforced
Composites for Potential Applications in External Beam Radiotherapy**

V.V. Destura, C.T.J. Quiñones and R. Vequizo

141

A Method for *In Vivo* Dosimetry Using an Electronic Portal Imaging Device

D.R.S. Pamisa and C.T.J. Quiñones

169

**Kinetic Energy of Secondary Particles Produced from Various Electromagnetic Interactions
in Water: A Monte Carlo Study**

E.L.P. Rivera, D.R.S. Pamisa and C.T.J. Quiñones

179