

Table of Contents

Preface

Chapter 1: Materials for Energy Storage Devices

Characterization of LTO/Silicon Oxycarbide with Activated Carbon Addition for Anode of Lithium-Ion Batteries B. Priyono, M.F. Fitratama, S. Roulli, A. Subhan and A. Zulfia	3
Integration of Reduced Graphene Oxide in Platinum-Free Counter Electrode of Dye-Sensitized Solar Cell A.F. Madsuha, M.S. Wahab, S. Daelay, E.S. Rosa, D. Dhaneswara and A.H. Yuwono	12
Optimizing Performance of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (LTO) by Addition of Sn Microparticle in High Loading as Anode for Lithium-Ion Batteries B. Priyono, R.M. Ulum, A. Zulfia, S. Trixie, H. Jodi, L.Z. Ramadhan and A. Subhan	20
Optimizing Performance of ZnO Nanorod and Activated Carbon as a Composite Anode for Lithium-Ion Batteries B. Priyono, A.R. Bachtiar, H. Abraham, M.R. Nugraha, Faizah, A. Zulfia, J.F. Fatriansyah and A. Subhan	31
Performance of Coconut Shell Activated Carbon in $\text{LiMn}_{0.7}\text{Fe}_{0.3}\text{PO}_4/\text{CNT}/\text{C}$ Composite for Lithium Ion Battery Cathode N. Sofyan, D. Suhendar, A. Zulfia and A. Subhan	41
Preparation of Activated Carbon Derived from Water Hyacinth as Electrode Active Material for Li-Ion Supercapacitor J. Paduraksa, M. Luthfi, A. Verdianto, A. Subhan, W.B. Widayatno, B. Prihandoko, E. Kartini and C. Hudaya	50
The Effect of KOH Activator Concentration upon the Characteristics of Biomass-Derived Water Hyacinth Process on Lithium-Ion Capacitor M. Luthfi, J. Paduraksa, A. Verdianto, Y.D.S. Pambudi, B. Priyono, A. Zulfia Syahrial, J.K. Lee and C. Hudaya	58

Chapter 2: Biomedical Materials

Electrophoretic Deposition Performance of Hydroxyapatite Coating on Titanium Alloys for Orthopedic Implant Application N.F. Nuswantoro, D. Juliadmi, H. Fajri, M. Manjas, N. Suharti, D.H. Tjong, J. Affi and Gunawarman	69
Material Selection Based on Finite Element Method in Customized Iliac Implant D. Annur, M.S. Utomo, T. Asmaria, D.P. Malau, S. Supriadi, B. Suharno, A.J. Rahyussalim, Y. Prabowo and M.I. Amal	82
Recyclability of Dental Gypsum via Calcination A. Zakiyuddin, D.J. Indrani, R.A. Khoirurrijal and S. Astutiningsih	90
The Coating of Bovine-Source Hydroxyapatite on Titanium Alloy (Ti-6Al-4V ELI) Using Electrophoretic Deposition for Biomedical Application D. Juliadmi, N.F. Nuswantoro, H. Fajri, I.Y. Indriyani, J. Affi, M. Manjas, D.H. Tjong and Gunawarman	97
The Effect of Additional Zinc Oxide to Antibacterial Property of Chitosan/Collagen-Based Scaffold R. Alfata, G. Ramahdita and A.H. Yuwono	107
Effect of Multiwalled Carbon Nanotubes (MWCNTs) on the Micro-Hardness and Corrosion Behaviour Mg-Zn Alloy Prepared by Powder Metallurgy N. Darsono, M. Handayani, F.P. Lestari, A. Erryani, I.N.G. Putrayasa, Y.N. Thaha, Y.I. Sihaloho and H. Sutanto	115
Electrophoretic Deposition (EPD) of Natural Hydroxyapatite Coatings on Titanium Ti-29Nb-13Ta-4.6Zr Substrates for Implant Material H. Fajri, F. Ramadhan, N.F. Nuswantoro, D. Juliadmi, D.H. Tjong, M. Manjas, J. Affi, Y. Yetri and Gunawarman	123

Response Surface Methodology Study on Macroporous Hydroxyapatite Prepared by Protein Foaming-Consolidation Method A. Fadli, F. Huda, Komalasari, I. Habib and Arosyidin	132
Degradation Characteristics of Mg-1,6Gd Alloy at Low Thickness Reduction of Warm Rolling A.N.F. Hidayat, A. Zakiyuddin, S. Harjanto and O. Susanti	139

Chapter 3: Composites

Delamination Damages of Drilling Epoxy/Carbon/Basalt Fiber Reinforced Hybrid Composites Using Conventional Drill Machine I.D.G.A. Subagia, I.N. Sutantra and A.H. Yuwono	151
Effect of Nano-Al_2O_3 on Characteristics of Aluminium A356 Matrix Composite Produced by Stir Casting Route N.A.K. Islam, N.E. Wicaksana and A. Zulfia Syahril	160
Study of Mechanical Properties of Hemp Fiber Composites for Electric Bicycle Frames I.K.A. Atmika, I.D.G.A. Subagia, I.W. Surata, I.N. Sutantra and I.G.A.K. Suriadi	167
The Development of Natural Rubber Composite Based Canal Blocking to Sustain Peatland Environment n. kinasih, C.T. Stevanus, I.S. Nugraha, A. Aprizal, A. Cifriadi, T. Wijaya, D.R. Maspanger and A. Ramadhan	173
The Role of Al_2O_3 Particles on Mechanical Properties and Microstructure of Aluminum A356 Composites Produced by Stir Casting Method H. Haritsa, M.W. Akira and A. Zulfia Syahril	185
The Strength of Polylactic Acid Composites Reinforced with Sugarcane Bagasse and Rice Husk J. Anggono, B. Budiarto, S. Sugondo, H. Purwaningsih and Antoni	193

Chapter 4: Functional and Special Materials

Superparamagnetic Nanoparticles with Mesoporous Structure Prepared through Hydrothermal Technique A. Fadli, A. Amri, E.O. Sari, S. Sukoco and D. Saprudin	203
Tribological Study of Addition Oleic Acid in Palm and Coconut Oils as Bio-Lubricants D. Gasni, I. Fikri and M. Latif	210
Local Silica Sand as a Substitute for Standard Ottawa Sand in Testing of Cement Mortar W. Pratiwi, G.A. Karim and T. Rachmawati	220
Effect of Cobalt Content on the Structural Properties of Zirconia Prepared by Sol-Gel Method N.I. Ciptasari, A. Nora, L. Nuraini, Lusiana, N. Darsono and M.I. Amal	227
Preliminary Study on Gallium-Based Particle Synthesis by Ultrasonication for Microfluid Application R.M. Ulum, W.N. Putra and M.A. Hidayat	233
Surface Mechanical Properties of Tool Steel on the Addition of Carbon Nanotubes with the Process of Flame Spray Tungsten Carbide Coatings S. Mudiantoro, M. Gerry, W. Winarto, M. Anis, M. Kemal and M. Fadzli	238
The Comparison of Nitrogen Atom Solubility in the Formation of Surface Layer on Stainless Steel and Alloy Steel I.K.A. Widi, W. Sujana and T. Rahardjo	248

Chapter 5: Materials and Technologies of Chemical Production

Analysis of NiMoP/γ-Al_2O_3 Catalyst Preparation with Impregnation and Microwave Polyol Methods for Bio-Jet Production B.H. Susanto and J.R.V. Siallagan	257
The Role of Anionic Surfactant to the Particle Size Reduction of Conductive PANi M.A. Elita Hafizah, A.L. Mahar, Suparno, Andreas and A. Manaf	265

Micro-Fibrillated Cellulose Fabrication from Empty Fruit Bunches of Oil Palm M. Christwardana, A.S. Handayani, S. Savetlana, R.H. Lumingkewas and M. Chalid	272
Study on the Effect of Bleaching Treatment on the Mechanical Properties of Kenaf Fibers Y.A. Husnil, E. Yuanita, N. Ramadhani and M. Chalid	278
Performance of Mesoporous Organo Silica Membrane for Desalination A.E. Lestari, M. Elma, S. Rabiah, E.L.A. Rampun, A. Rahma and A.E. Pratiwi	285
Activated Natural Zeolite Membrane for Separating Dissolved Impurities in Coconut Sap H. Aripin, N. Busaeri, A.I. Gufroni and S. Sabchevski	293
Adsorption of CO Gas and Cigarette Smoke Using NiO-Modified Metal Activated Carbon Yuliusman, F. Al Farouq, S.P. Sipangkar, M. Fatkhurrahman and S.A. Putri	303
Modified Activated Carbon Using NiO for Natural Gas Storage Yuliusman, M. Fatkhurrahman, F. Al Farouq, S.A. Putri, S.P. Sipangkar and Nasruddin	311
Numerical Simulation of Carbon Dioxide Absorption by Monoethanolamine Solution with Super Mini Ring Contactor M. Yuswan, Hamzah and R.M. Audry	318
Solvent Effects on the Synthesis of Polymeric Nanoparticles via Block Copolymer Self-Assembly Using Microporous Membranes S. Agustina, M. Tokuda, H. Minami, C. Boyer and P.B. Zetterlund	324
Study of Zeolite Usage in Thermal Degradation Process of Polypropylene Pyrolysis N.G. Rahmat, J.F. Fatriansyah, D. Dhaneswara and A.P.S. Kaban	331

Chapter 6: Welding Technologies

Mechanical Properties and Microstructure of Pulsatile Current Gas Tungsten Arc Welding (PC-GTAW) of AISI 304L Butt Joint Weld A. Widyianto, A.S. Baskoro and G. Kiswanto	339
Integrity Analysis of a Vessel Subject to Weld Repair and Post-Weld Heat Treatment: Thermal Stress Distribution Using Numerical Approach A. Yatim, G. Prayogo, A. Karayan, H. Novi, W. Hamdani, S. Tambunan and R. Burhanuddin	348
Optimization of Gas Metal Arc Welding (GMAW) Parameters for Minimum Distortion of T Welded Joints of A36 Mild Steel by Taguchi Method A.S. Baskoro, R. Hidayat, A. Widyianto, M.A. Amat and D.U. Putra	356
Study the Effect of Welding Position and Plate Thickness to the Mechanical and Microstructural Properties of the TIG Dissimilar Metal Welded between Carbon Steel ASTM A36 and Stainless Steel 304 Plates W. Winarto, M. Anis, R. Riastuti and I.N. Suarjana	364

Chapter 7: Metallurgical Engineering

Alteration in the Phase Morphology of Ti-6Al-4V Alloy Produced Using Directed Energy Deposition D. Nursyifaulkhair, F.A. Mawardi, N. Park, E.R. Baek and S. Kim	375
Die Soldering Behavior of H13 and Cr-Mo-V Tool Steel on Die Casting Process on Nitriding-Shot Pinning Die Surface Treatment M.A. Mochtar and R. Aldila	381
Effect of Coal Blended on the Physical Properties of Iron Ore Briquette for Direct Reduction Iron Khairil, S. Bahri, N. Ali, S.E. Sofyan and Jalaluddin	391
Effect of Cooling Rates during a Double Stage Solution Treatment on the Massive Phase Formation in Ti-6Al-4V Alloy G. Suprobo, F.A. Mawardi, N. Park and E.R. Baek	398
Evaluation of Austenite Grains Growth in High Nb and Low Nb HSLA Steel E.S. Siradj	404
Influence of Manganese on the Recrystallization Characteristics and Texture Development of Cu-29Zn Alloys I. Basori and B.T. Sofyan	412
Investigation of Dynamic Recrystallization Phenomenon in Drawn Ti-6Al-4V Alloy J.A. Nugroho, G. Suprobo, N. Park and E.R. Baek	419

Massive Phase Transformation as a New Prospective on Microstructural Design in a Titanium Alloy - A Review E.R. Baek and G. Suprobo	428
Study of Low-Grade Nickel Laterite Processing Using Palm Shell Charcoal as Reductant B. Suharno, N.P. Ilman, A. Shofi, D. Ferdian and F. Nurjaman	436
The Use of Local Raw Materials for the Manufacturing of Import Substitution Casting Products on Investment Casting Technology H. Abdullah and S.B. Pratomo	447
Effect of Strontium Addition in Graphite Morphology and Nodularization of Hypoeutectic Cast Iron Rahmadi and D. Ferdian	454