

Table of Contents

Preface

Chapter 1: Functional and Special Materials, Processing Technologies

Synthesis and Characterization of Complex from K₄[Co(SCN)₆], Zinc(II) Chloride and Quinoline as Electrode Material of K-Ion Battery	
A. Rifaldi, Fariati, H.W. Wijaya, W.D. Jayanti, S. Golhen and I.W. Dasna	3
Effect of Polyaniline on Structural and Optical Characteristics of Fe₃O₄ and TiO₂ Nanoparticles	
A. Taufiq, M.S. Nuroni, N. Hidayat, S.U.I. Subadra, Sunaryono, A. Hidayat and Y. Yudyanto	9
Annealing Temperature Effect of ZnO Seed Layer on Integrated Photosupercapacitor Performance	
M. Diantoro, S. Yanor, T. Suprayogi, N. Mufti, Aripriharta, A. Taufiq, Sunaryono and W. Meevasana	16
Performance of B-Doped SrTiO₃/Ni Sheet for Supercapacitor Material Application	
M. Diantoro, A.A. Ittikhad, T. Suprayogi, Nasikhudin and J. Utomo	25
Fabrication of Bilayer Fe₂O₃/ZnO Photoanode and its Photoelectrochemical Performance	
M.T.H. Abadi, S. Maryam, Y. Yudyanto, S. Zulaikah and N. Mufti	32
Effect of Additional MnFe₂O₄ on a Combination of EG-Water Nanofluid and Volumetric Flowrate Variations towards Heat Transfer in Shell and Tube Heat Exchanger System	
A.A. Permanasari, F. Fadillah, P. Puspitasari and S. Sukarni	38
The Effect of Addition of Waste Materials on Nitrile Butadiene Rubber to the Mechanical Properties of Roller Rubber	
P.H. Setyarini, Purnomo, D.H. Sulistyarini and A. Asfia	47
Phase Identification and Mechanical Properties on Post Weld Heat Treatment of Steel St.70	
S. Angkasa, W.S.B. Prastyo, P. Puspitasari and A. Aminnudin	53
Corrosion Resistance Analysis of ST37 Carbon Steel Material Using Phosphate Conversion Coating in Various Immersion Durations	
P. Puspitasari, C. Alifian, Aripriharta, J.A. Razak and M.M.A. Pratama	61
Measuring the Influence of Process Parameter on CuCr Electrode Tool Wear Rate for Biocompatible Zr-Based BMG Cutting Using Sinking-EDM	
Y.R.A. Pradana, F.A. Fanani, A. Aminnudin, Wahono and J.S. Jang	68

Chapter 2: Materials for Biomedical Application

Effect of Drying Methods on the Structure of Bacterial Cellulose from Pineapple Peel Extract	
H. Suryanto, M. Muhajir, N. Zakia, U. Yanuhar, A. Aminnudin and Y.R.A. Pradana	79
Effect of Disintegration Process on the Properties of Bacterial Cellulose Foam	
H. Suryanto, M. Muhajir, T.A. Sutrisno, U. Yanuhar and R.D. Bintara	86
Effect of Alkalization on the Bacterial Cellulose Film Structure Produced Using the Pineapple Waste	
M. Muhajir, H. Suryanto and A. Larasati	92
Physical Properties Characterization and Design Comparation of Knee Implant with Ti6Al4V Material	
G.A. Kurniawan, A. Andoko, R. Wulandari, Sunomo and A.D. Putra	97
Punch Tool Speed and Material Effect on Keychain Cranioplasty Plate Dimensions Using Finite Element Method	
D.Z. Lubis, Aminnudin and A.H. Perwira	105
Simulation of Hip Joint Implants Using Finite Element Method with Time and Load Variations	
A.D. Putra, A. Andoko, R. Wulandari and G.A. Kurniawan	111

Correlation of Extract Composition on Antioxidant Activity of Electrospun PolyvinylPyrrolidone/<i>Bassela rubra linn</i> Leaf Extract Composite	
E.L. Septiani, A.A. Gabriel, O.P. Prastuti, D.N. Indahsari, E.D. Ariyanti, S. Machmudah, s. winardi, w. wahyudiono, H. Kanda and M. Goto	122
Fracture Propagation Pathways Pattern on UV-Irradiated Double-Edge Cracked of Mordenite Zeolite-HDPE Composites	
Purnomo and P.H. Setyarini	128

Chapter 5: Biomass Processing

Pyrolytic Characteristics and Kinetic Parameters Evaluation of Cassava Stalks Using Thermogravimetric Analyzer	
S. Sukarni and M.R. Ramadhan	137
Arrhenius Kinetic Analysis during Combustion of <i>Spirulina platensis</i> Microalgae	
S. Sukarni and M. Anwar	142
Thermal Characteristic of <i>Tetraselmis chuii</i> Combustion Influenced by Titanium Dioxide (TiO_2) Nanoparticle	
S. Sukarni, A. Prasetyo, R. Wulandari, A.E. Widiono and P. Puspitasari	149
Thermogravimetric Study on the Thermal Characteristics of <i>Tetraselmis chuii</i> Microalgae Pyrolysis in the Presence of Titanium dioxide	
S. Sukarni, A.E. Widiono, R. Wulandari, A. Prasetyo and P. Puspitasari	156
Synthesis of Methyl Ester from Rice Bran Oil through the Esterification Reaction	
A. Santoso, Abdurrohman, A.R. Wijaya, D. Sukarianingsih, Sumari and D.E. Putri	164
Fabrication Process Optimization of <i>Gombong (Gigantochloa pseudoarundinacea)</i>, <i>Haur Hejo (Bambusa tuloides)</i> and <i>Tali (Gigantochloa apus)</i> Bamboo Fibers for Structural Application	
Martijanti, A.N. Pratomo, Sutarno and A.L. Juwono	172
Synthesis of $CaO@CoFe_2O_4$ Nanoparticles and its Application as a Catalyst for Biodiesel Production from Used Cooking Oil	
T.R. Primadi, F. Fajaroh, A. Santoso, Nazriati and E. Ciptawati	184

Chapter 6: Materials and Technologies in Environmental Engineering

Adsorption Properties of Magnetic Sorbent $Mn_{0.25}Fe_{2.75}O_4@SiO_2$ for Mercury Removal	
Y.A. Muhammad, Sunaryono, A.J.W.T. Nenohai, N. Mufti, R. Situmorang and A. Taufiq	197
Geochemical Explorations of Leached Fe in Tiga Warna Beach, Indonesia	
A.R. Wijaya, A.M. Fajar, A. Santoso and D.E. Putri	205
Activation of Zeolite from Malang as Catalyst for Plastic Waste Conversion to Fuel	
A. Santoso, I.B.S. Sumari, N.N. Safitri, A.R. Wijaya and D.E. Putri	212
Fourier Transform Infrared (FTIR) Spectroscopy and X-Ray Diffraction (XRD) Analysis of Synthetic Waste during Combustion Process	
S. Sukarni and L.A.A. Saputra	220