

Table of Contents

Preface

Chapter 1: Advanced and Functional Materials

The Study on Tuning Photoluminescence of Colloidal Graphene Quantum Dots Synthesized through Laser Ablation F.H. Murdaka, A.A. Nugroho, A. Kusumaatmaja, Isnaeni and I. Santoso	3
Crystal Structure and Electrical Properties of $(1-x)(\text{Ba}_{0.85}\text{Sr}_{0.15})\text{TiO}_3 - x(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$ System U. Nuraini, Y.N. Kaukaba, Mashuri and Suasgoro	8
Precipitated Silica from Sodium Silicate by CO_2 on Fixed Bed Column R. Dewati, Suprihatin, K. Sumada and S. Muljani	14
The Morphology of Si-K-HAs Composite Prepared by Spray Drying S. Muljani, H. Setyawan and K. Sumada	19
Mechanical Exfoliation of Reduced Graphene Oxide From Old Coconut Shell as Radar Absorber in X-Band A.F. Kurniawan, M.S. Anwar, K. Nadiyyah, Mashuri, Triwikantoro and Darminto	25
Characterization of TiN Oxide Doping Antimony Thin Layer with Sol- Gel Spin Coating Method for Electronic Device A. Doyan, Susilawati, A. Harjono, S. Azzahra and M. Taufik	30
The Effects of Layer Thickness of Radar Absorbing Materials Prepared by Double Layer Method on X-Band Wavelength Frequency M. Zainuri, R.F. Puspitasari, D. Ristiani and Triwikantoro	35
Geopolymer Concrete for Radiation Shielding Application Nurhasmi, D. Tahir, B. Abdullah, A. Ansar, S. Ilyas, I. Mutmainna and W.I. Madda	41
Effects of Spin-Orbit Coupling on the Electronic and Excitonic Structures of Monolayer WS_2 B.E. Dharma, A. Syahroni and M.A. Majidi	48
Characterization of BaM and PaNi-Based Radar Absorbency (RAM) Behavior with Multilayer Geometry Structure for X-Band Absorption M. Zainuri and D. Andriyani	54
Preparation and Characterization of Electrospun Composite Fiber of Polymer-TiO_2 G. Yudoyono, Sudarsono and D. Anggoro	60
Structural Analysis and Electrical Properties of Amorphous Carbon Thin Films D.I. Pamungkas, Mukarromah, B. Priyanto, H. Nakajima, S. Tunmee and Darminto	66
Optical Transmission of p-Type a-Si:H Thin Film Deposited by PECVD on ITO-Coated Glass S. Prayogi, M.A. Baqiya, Y. Cahyono and Darminto	72
Synthesis of Silica-Potassium-Nitrogen from Carbamide and Potassium Silicate by CO_2 Precipitator K. Sumada, S. Muljani and C. Pujiastuti	77
Effect of Modified SiO_2 on the Hydrophobic Properties as Self-Cleaning Materials L. Silvia, A.H. Wardani, Y.D. Hapsari and M. Zainuri	83
Particle Size Analysis of the Synthesised ZrO_2 from Natural Zircon Sand with Variation of pH Deposition Using Alkali Fusion-Coprecipitation Method C.F.K. Murti, H. Aldila, Endarko and Triwikantoro	89
Fabrication of Amorphous Carbon Thin Film from CH_4 Using PEVCD B. Priyanto, M. Saleh, S. Tunmee, C. Euaruksakul, Y. Cahyono, Triwikantoro and Darminto	95
Low Temperature Graphene Growth Effort on Corning Glass Substrate by Using VHF-IP HWC-PECVD M.A. Yusuf, A. Rosikhin, J.D. Malago, F.A. Noor and T. Winata	100
Electrochemical Deposition of Polyaniline on Carbon Steel for Corrosion Study in Geothermal Solution G. Aristia, L.Q. Hoa and R. Baessler	107

Chapter 2: Bio- and Food Technologies, Materials in Biomedicine

Relationship between the Structure and Electrical Conductivity of 12-Mer Single-Stranded Polyadenine Studied by Scanning Tunnelling Microscope H. Rozak, W.N. Zaharim, I. Miyazaki, N.E. Ismail, S.N. Abu Bakar, D. Kernain, R. Samian, K. Ichimura, M.I. Mohamed-Ibrahim, S. Sulaiman and I. Watanabe	119
Study of Carbonated Calcium Phosphate Precipitation on Collagen R. Tasomara, S. Julia, Y.W. Sari, Nurlery and D.S. Soejoko	126
Physicochemical and Cytotoxicity Characterization of Injectable Bone Substitute Based on Hydroxyapatite - Chitosan - Streptomycin for Spinal Tuberculosis Cases S.A. Rachmawati, D. Hikmawati, A.S. Budiatin and A.P. Putra	133
Quality Improvement of Biomaterial of <i>Lemna</i> Sp Y. Andriani, Iskandar, I. Zidni and R. Risdiana	139
Hydroxyapatite-Collagen Composite Made from Coral and Chicken Claws for Bone Implant Application Siswanto, D. Hikmawati, Aminatun and M. Zamawi Ichsan	145
Study on Formalization of Oil Palm Trunk Modified by Melamine Formaldehyde T.N. Manik, Mashuri and Darminto	151
The Role of Relative Humidity on Physical Characteristics of Poly Vinyl Alcohol-<i>Aloe vera</i> Fiber Membrane by Using Electrospinning Methods D. Hikmawati, E.F. Adiputri, A.P. Putra and J. Ady	157
Synthesis of Carbon Nanosphere at Low Temperatures Based on Bamboo Fiber Y.K. Lahsmin, D. Tahir, B. Abdullah, S. Ilyas and I. Mutmainna	163
Irradiation Effect on the Structural Properties of <i>Ipomoea batatas</i> L as a Function of Temperature and Time S. Fatimah, M. Nur, S.D.A. Ilyas and D. Tahir	169
Sorption Efficiency in Dye Removal and Thermal Stability of Sorghum Stem Aerogel E.L. Septiani, O.P. Prastuti, Y. Kurniati, M. Fauziyah, Widiyastuti, H. Setyawan, Wahyudiono, H. Kanda and M. Goto	175
Investigation of Structural and Antifungal Behaviors of Nano-Sized Anatase Titanium Dioxide Synthesized by Co-Precipitation Route A. Taufiq, D. Arista, Sunaryono, R.E. Saputro, N. Hidayat, S. Soontaranon, E. Handoko and Darminto	181
Optimization of Polydimethylsiloxane Synthesized Parameters as Vitreous Humour Substitutes S. Setiadji, Fitrilawati, A.N. Fauza, A. Ardi, R. Novianti, N. Syakir, Waslaluiddin, I. Rahayu, A.S. Kartasasmita and R. Risdiana	189
Physical Characteristics of Soft Tissue Phantom from Silicone Rubber Based Vulcanization System A. Ansar, D. Tahir, B. Abdullah, Nurhasmi, S. Fatimah and Jusmawang	194
Synthesis of Precipitate Calcium Carbonate with Variation Morphology from Limestone by Using Solution Mixing Method Z. Arifin, Triwikantoro, B.A. Subagyo, M. Zainuri and Darminto	200
Banana Peel Activated Carbon in Removal of Dyes and Metals Ion in Textile Industrial Waste O.P. Prastuti, E.L. Septiani, Y. Kurniati, Widiyastuti and H. Setyawan	204
The Analysis of Composite Particle Board Based on Mushroom Growing Media Waste T.P. Harmi, Sutarman, W. Edi, A. Faldy, A. Syamsul and G.A.N. Fitri	210
Solvent Effect on Bond Dissociation Enthalpy (BDE) of Tetrahydrocurcumin: A Theoretical Study L.S.P. Boli, N.D. Aisyah, V. Khoirunisa, H. Rachmawati, H.K. Dipojono and F. Rusydi	215
The Effects of Split Valence Basis Sets on Muon Hyperfine Interaction in Guanine Nucleobase and Nucleotide Structures W.N. Zaharim, S. Sulaiman, S.N. Abu Bakar, N.E. Ismail, H. Rozak and I. Watanabe	222
Predicting Notable Radical Scavenging Sites of Gnetin C Using Density Functional Theory V. Khoirunisa, L.S.P. Boli, R. Nur Fadilla, A.G. Saputro, H. Rachmawati, H.K. Dipojono and F. Rusydi	229

Chapter 3: Investigation of Magnetic and Superconducting Properties

Synthesis and Characterization of Magnetic Rubidium Superoxide, RbO_2 F. Astuti, M. Miyajima, T. Fukuda, M. Kodani, T. Nakano, T. Kambe and I. Watanabe	237
Electrical Transport Properties of Perovskite $\text{La}_{0.7}\text{Sr}_{0.2}\text{Ba}_{0.1}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ ($x = 0$ and 0.1) Manganite D.R. Munazat, B. Kurniawan and A. Imaduddin	243
The Doping Effects of SiC and Carbon Nanotubes on the Manufacture of Superconducting Monofilament MgB_2 Wires A. Imaduddin, Samsulludin, M.R. Wicaksono, I. Saefuloh, S. Herbirowo, S.D. Yudanto, Hendrik, H. Nugraha, Lusiana, E. Mabruri, N. Darsono and A.W. Pramono	249
Magnetic Properties of $\text{YBa}_2\text{Cu}_3\text{O}_6$ Studied by Density Functional Theory Calculations I. Ramli, S.S. Mohd Tajudin, M.R. Ramadhan, D.P. Sari, S. Sulaiman, M.I. Mohamed-Ibrahim, B. Kurniawan and I. Watanabe	257
Enhanced Room-Temperature Ferromagnetism in Superconducting $\text{Pr}_{2-x}\text{Ce}_x\text{CuO}_4$ Nanoparticles M.A. Baqiya, P.E.D. Putra, R. Irfanita, Suasmoro, Darminto, T. Kawamata, T. Noji, H. Sato, M. Kato and Y. Koike	263
Magnetic Properties of Hole-Doped Pyrochlore Iridate $(\text{Y}_{1-x-y}\text{Cu}_x\text{Ca}_y)_2\text{Ir}_2\text{O}_7$ J. Angel, R. Asih, H. Nomura, T. Taniguchi, K. Matsuhira, M.R. Ramadhan, I. Ramli, M. Wakeshima, Y. Hinatsu, M.I. Mohamed-Ibrahim, S. Sulaiman and I. Watanabe	269
Physical Properties of Encapsulated Iron Oxide T. Saragi, B. Permana, A. Therigan, S. Hidayat, N. Syakir and R. Risdiana	277
Characterization of Barium M-Hexaferrite with Doping Zn and Mn for Microwaves Absorbent Susilawati, A. Doyan, M. Taufik, Wahyudi, E.R. Gunawan, A. Fitriani and Nazarudin	282
Comparative Study on Magnetism of Reduced Graphene Oxide (rGO) Prepared from Coconut Shells and the Commercial Product R. Asih, E.B. Yutomo, D. Ristiani, M.A. Baqiya, T. Kawamata, M. Kato, I. Watanabe, Y. Koike and Darminto	290
Magnetic Study of the Lower Critical Field of Organic Superconductor λ-(BETS)$_2\text{GaCl}_4$ D.P. Sari, K. Hiraki, T. Nakano, M. Hagiwara, Y. Nozue, T. Kusakawa, A. Hori, A. Yamamoto, I. Watanabe and Y. Ishii	296
Complex Permittivity, Permeability and Microwave Absorption Studies of Double Layer Magnetic Absorbers Based on $\text{BaFe}_{12}\text{O}_{19}$ and $\text{BaFe}_{10}\text{CoZnO}_{19}$ E. Handoko, I. Sugihartono, M.A. Marpaung, U. Cahyana, S. Aritonang, J. Zulkarnain, Rusmono, A. Taufiq, Sunaryono, M. Randa and M. Alaydrus	302
Preparation of Local Raw Material for α-Fe_2O_3 Nanoparticles Powder from Mineral Extraction of Iron Sand M.P. Izaak, H. Sitompul, A.A. Wisnu and Y.E. Gunanto	308
Study of Magnetic Properties in Electron Doped Superconductor $\text{Eu}_{2-x}\text{Ce}_x\text{CuO}_{4+\alpha}$ Y. Maryati, N. Nafisah, D.G. Auliya, E. Nurwati, T. Amalia, Y.R. Tayubi, T. Saragi and R. Risdiana	314
Crystal Structure and Magnetic Properties of Non-Stoichiometric Co_2MnGa Heusler Alloy M.Y. Pandu Akbar, R.R. Sihombing, A. Sakai, A.A. Nugroho and S. Nakatsuji	319
Analysis of Physical Properties, Crystal Structure and Magnetic Properties of Barium Hexaferrite Doped with 2 % wt. of SrO and Prepared by Coprecipitation Method Suprapedi, Muljadi, D. Djuhana and R. Ramlan	325
Effect of Copper Substitution on the Electrical Transport Properties of $\text{La}_{0.7}\text{Ba}_{0.1}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ ($x = 0$ and 0.05) Manganites B. Kurniawan, D.S. Razaq and A. Imaduddin	331
Enhanced Microwave Absorbing Capabilities of Multilayer Absorbers Based on $\text{BaFe}_{12}\text{O}_{19}$ and Fe_3O_4 E. Handoko, I. Sugihartono, M.A. Marpaung, U. Cahyana, S. Aritonang, J. Zulkarnain, Rusmono, A. Taufiq, Sunaryono and M. Alaydrus	338
The Effect of Freezing-Thawing Route Number on Magnetic Properties and Nanostructural of Fe_3O_4/ Carboxymethyl Cellulose/Polyvinyl Alcohol Magnetic Hydrogel Sunaryono, M.N. Kholifah, A. Taufiq and E. Handoko	344

Synthesis and Characterization of $\text{Nd}_2\text{Fe}_{14}\text{B}$ Powder Prepared by Using Milling and Heat Treatment	
R. Ramlan, P. Sardjono, Muljadi, D. Setiabudidaya and F. Gulo	352
Growth of Free-Standing $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ Nanoparticles	
S. Winarsih, F. Budiman, H. Tanaka, T. Adachi, T. Goto, B. Soegijono, B. Kurniawan and I. Watanabe	357
Study of Magnetoresistance Effect and Magnetic Properties of $\text{La}_{0.67}\text{Sr}_{0.33}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ ($x = 0$ and 0.2) Material Prepared by Sol-Gel Method	
U. Widyaiswari, B. Kurniawan, A. Imaduddin and I. Watanabe	363

Chapter 4: Materials for Technologies of Energy Storage and Conversion

Characteristics of Large Area Perovskite Solar Cells from Electrodes of Used Car Batteries	
A. Bahtiar, C. Agustin, E.S. Nurazizah, A. Aprilia and D. Hidayat	373
Study of Electrochemical Deposition Process of Graphene Oxide on DSSC TiO_2 Based Photoanode	
A. Aprilia, V. Marcelina, F. Yuliasari, Y.W. Hartati, Fitrilawati, L. Safriani and R.E. Siregar	378
The Effect of Reduced Graphene Oxide (rGO) Coating on Electrical Conductivity of Lithium Ferro Phosphate (LFP) as an Alternative Cathode for Li-Ion Battery	
E. Suarso, A.Z. Laila, F.A. Setyawan, M. Zainuri, Z. Arifin and Darminto	386
Preparation of Lithium Iron Phosphate-Carbon Composite as a Cathode for Lithium Ion Battery	
I. Rahayu, A.R. Noviyanti, D. Rakhmawaty, A. Anggraeni, H.H. Bahti, S. Hidayat and R. Risdiana	392
Analysis of Defects and Surface Roughness on the Hydrogenated Amorphous Silicon (a-Si:H) Intrinsic Thin Film for Solar Cells	
Y. Cahyono, N. Dwi Purnamasari, M. Zainuri, S. Pratapa and Darminto	398
μSR Study with Light Irradiation of P3HT:ZnO Nanoparticles as Active Material of Hybrid Solar Cells	
L. Safriani, R. Risdiana, Fitrilawati, A. Bahtiar, A. Aprilia, R.E. Siregar, M. Manawan, D.P. Sari, J. Angel and I. Watanabe	404
Band Gap Optimization of Thin Film a-Si:H Bifacial Solar Cells (BFSCs) Using AFORS-HET	
D. Hamdani, Y. Cahyono, G. Yudoyono and Darminto	409
Structure, Chemical Stability and Magnetic Properties of Lanthanum Silicate Oxide Apatite Synthesized by Hydrothermal Method	
Y.T. Malik, A.R. Noviyanti, N. Akbar, I. Hastiawan, T. Saragi and R. Risdiana	415
Effect of Electrical Resistance of TiO_2 Layer Characteristics of Dye Sensitized Solar Cell Using Chlorophyll as a Sensitizer	
N. Puspitasari, N.Y. Cahaya, G. Yudoyono, G. Prajitno and Darminto	422
Energy Storage Characteristics of Electrochemically Deposited Graphene Oxide on ITO and Cu Substrates	
Fitrilawati, V. Marcelina, D.U. Dzujah, A. Bahtiar, Y.W. Hartati and N. Syakir	428
Characteristics of CMC from Corncob and its Application as Electrode Binder in Lithium Ion Battery	
S. Hidayat, I. Mubarak, B. Adiperdana, B.J. Suroto, N. Riveli, Y.W. Hartati and I. Rahayu	433
Synthesis of n-Doped Reduced Graphene Oxide from Coconut Shell as Supercapacitors	
I. Khambali, I.S. Ardiani, A.R. Kurniawan, Triwikantoro, M. Zainuri and Darminto	437
Synthesis and Characterization of Supercapacitor Electrode from Fiber of <i>Borassus flabelifer</i> L by Activation Method	
F.A. Prasetya, U. Anggarini, Y. Zakaria and R.D.S. Putri	444
Bi Doping Effect on the Conductivity of Lanthanum Silicate Apatite	
A.R. Noviyanti, N. Akbar, I. Hastiawan, I. Rahayu, Haryono, Y.T. Malik and R. Risdiana	451
Effect of Ni Doping Variations on Microstructure and Conductivity of Cathode $\text{LiNi}_x\text{Fe}_{1-x}\text{PO}_4/\text{C}$ Materials	
M. Zainuri, B.A. Subagyo and E. Novialent	456

Chapter 5: Modeling, Computational Procedures and Devices in Research of Functional Materials

Effects of the Supercell's Size on Muon Positions Calculations of La_2CuO_4 M.R. Ramadhan, I. Ramli, M.D. Umar, S. Winarsih, D.P. Sari, A. Manaf, B. Kurniawan, M.I. Mohamed-Ibrahim, S. Sulaiman and I. Watanabe	465
Study on the Diffusion Rate of the Charge Carrier Transport in Regio-Random P3HT N. Riveli, B. Adiperdana, L. Safriani, B.J. Suroto, A.R. Noviyanti, I.H. Mohammad, I. Rahayu, M. Manawan, T. Saragi and R. Risdiana	471
An Approach to the Intermediate State of the Distributed Internal Fields on Muon Site M.D. Umar and I. Watanabe	476
μSR Spectrum Reconstruction Using Monte Carlo Approach: A Preliminary Study B. Adiperdana and R. Risdiana	483
Optical Spectra of Bi_2Se_3: The Effects of Electron-Hole Interactions D.N. Asturo, A. Syahroni and M.A. Majidi	489
Effects of Polarization Function on the Spin Contamination and Distribution in β'-$\text{Me}_4\text{P}[\text{Pd}(\text{dmit})_2]_2$ S.N.A. Ahmad, S. Sulaiman, L.S. Ang and I. Watanabe	494
Numerical Simulation on Effects of TCO Work Function on Performance of a-Si:H Solar Cells A. Sholih, D. Hamdani, S.T. Wicaksono, M.I.P. Hidayat, Y. Cahyono and Darminto	501
A Potential Application of Photonic Jet in Observing Micro-Metric Materials A. Abdurrochman, M.O. Wahidullah, D. Naufal, D.S. Sofiati, A. Aprilia, L. Safriani, S. Perrin and S. Lecler	507