

Table of Contents

Preface

Chapter 1: Investigation of Magnetic and Electronic Characteristics of Advanced Functional Materials

Effect of Nitrogen with Pyridinic Configuration on Magnetic Moments in Graphene Sheets: Density Functional Theory Study A.J.W.T. Nenohai, F.M. Santana, R. Asih, R. Arifin and D. Darminto	3
Structural, Dielectric, and Magnetic Characterization of $\text{Ba}_{0.6}\text{Sr}_{0.4}\text{Fe}_{11.50}\text{Al}_{0.50}\text{O}_{19}/\text{MoS}_2$ Composite M.P. Izaak, Y.E. Gunanto, H. Sitompul, J. Setiawan, A. Mulyawan, Y. Yunasfi and W.A. Adi	11
A Comparison Study on Structural Properties in $\text{La}_{0.7}\text{Ca}_{0.2}\text{Sr}_{0.1}\text{MnO}_3$ Compound Synthesized by Solid-State, Sol-Gel, and Wet-Mixing Methods P.Z.Z. Nehan, O. Vitayaya, D.R. Munazat, M. Naibaho, M. Manawan, D. Darminto and B. Kurniawan	17
Investigating the Narrowing Effect in Muon Spin Relaxation within Fluctuating Magnetic Fields: A Strong Collision Model Approach M.D. Umar and H.L. Hariyanto	27
The Improvement of Magnetic Order in Overdoped Regime by Magnetic Impurities in $\text{Eu}_{2-(x+y)}\text{Ce}_{x-y}\text{Cu}_{1-y}\text{Fe}_y\text{O}_{4+\alpha-\delta}$ M.N. Farras, R. Pratama, M.N. Ardian, U. Widayaiswari, R.S. Effendi, M.A. Syakuur, A.E. Putri, R. Risdiana and T. Saragi	37
Low-Pressure Magnetic Susceptibility Study in λ-(BETS)$_2$GaCl$_4$ A.A. Firdaus, D.P. Sari, M. Ueno, R. Nomura, N. Katusoka, A.E. Putri, I. Watanabe, T. Suzuki and Y. Ishii	47
Preparation of Magnetic Film Using Kappa Carrageenan Biopolymer Matrix and Its Characterization M.A.F. Turnip, P.S. Rudati, A. Taufiq and A.A. Nugroho	55
Synthesis Temperature Affects the Crystalline and Magnetic Properties of Strontium-Modified Cobalt Ferrite Nanoparticles N.P. Prasetya, S. Suharyana, N. Rikamukti, R. Riyatun, U. Utari and B. Purnama	63
The Suppression of Superconductivity in Heavily Overdoped Regime of $\text{Eu}_{1.81}\text{Ce}_{0.19}\text{CuO}_{4+\alpha-\delta}$ by Nonmagnetic Zn Impurities R. Pratama, M.N. Farras, M.A. Syakuur, Y. Maryati, U. Widayaiswari, A.E. Putri, T. Saragi, A.R. Noviyanti and R. Risdiana	73
Vacancy Induced Magnetism in Tetragonal Structure ZrO_2 Based on First-Principles Study M.Y.H. Widiyanto, R. Asih and S. Pratapa	81
First-Principles Simulation of Structural and Magnetic Properties of H-Terminated Silicene and Germanene A.N. Rahadi, C.W. Oktavina, N. Fajariah, M. Fadllyana, A.D. Nugraheni and S. Sholihun	87
Layer-Resolved Rashba Spin-Orbit Coupling of Ferromagnetic Interface from a First-Principles Study I. Pardede, M. Obata, D. Yoshikawa, T. Kanagawa, N. Ikhsan and T. Oda	93
Multiferroicity in Quasi-One-Dimensional Compound $\text{Ca}_3\text{NiMnO}_6$ N. Mufti, I.G.A.I.F. Ramadhani, T. Amrillah, A. Taufiq, S. Sunaryono, M. Diantoro and G.R. Blake	99
Magnetism and Electronics of Pyridinic and Pyrrolic Site in Graphene: A Density Functional Theory Study F.M. Santana, A.J.W.T. Nenohai, R. Arifin, R. Asih and D. Darminto	107
Magnetic Study of $\text{LiFe}(\text{P,Si})\text{O}_4$ Probed by SQUID and μSR F. Astuti, M. Zainuri, D. Darminto, M.R. Ramadhan, D.P. Sari and I. Watanabe	117
Synthesis of Fe_3O_4 and Fe_2O_3 Nanocrystal from Iron Sand with Semi-Automatic Coprecipitator A.D. Agustin, A.N.K. Wardani, S.R. Meutuah, I. Sidharta and D. Darminto	123

Chapter 2: Nanomaterials for Drug Delivery and Antibacterial Applications

Fe₃O₄/HA-APTES Nanocomposite as Drug Delivery Agent R.C. Sanjaya, J. Utomo, S.T.U.I. Subadra, M.S. Abd Aziz, N. Hidayat and A. Taufiq	133
Synthesis of Mg_{0.5}Fe_{2.5}O₄/Chitosan Nanocomposite for Drug Delivery System M. Rohmah, A. Nikmah, A. Hidayat, S. Sunaryono, M.S. Abd Aziz and A. Taufiq	143
Impact of Annealing Treatment on the Green Synthesis of Magnetite (Fe₃O₄) Nanoparticles Using <i>Citrus limon</i> Juice for Antibacterial Activities R. Arilasita, A. Fitriani, N.P. Prasetya, U. Utari, R. Riyatun and B. Purnama	153
Potentially of Bengawan Solo Iron Sands as Fe³⁺ Source in Green-Coprecipitated CFO & Ag-CFO Nanoparticles for Antibacterial Agent A. Musadewi, R. Arilasita, U. Utari, R. Riyatun and B. Purnama	163

Chapter 3: Composites for Microwave Absorption

Cobalt Titanate/Natural Rubber Composites: A Promising Microwave Absorber in X-Band M. Apit, Y.K. Krisnandi and W.A. Adi	175
Hard-Soft Magnetic Composite as Microwave Absorber in S-Band and C-Band Y.E. Gunanto, J. Setiawan, M.P. Izaak, W.A. Adi, A. Mulyawan, H. Sitompul and Y. Yunasfi	191
Radar Absorbption Performance in the K_a- Band Region of Fe₃O₄/SWCNT/TiO₂ Nanocomposite D.A. Putra, W. Agista, S.T.U.I. Subadra, S. Sunaryono, E. Handoko, M. Alaydrus, N.E. Khamsan and A. Taufiq	201

Chapter 4: Photocatalysts for Wastewater Treatment

Influence of Green-Synthesized Fe₃O₄/ PEG Nanocomposite Concentration on Photodegradation of Methylene Blue C.K. Bagasdeva, N.I. Istiqomah, L.J. Mahardhika, E.K. Sari, N. Mabarroh, R.M. Tumbelaka, D.A. Larasati and E. Suharyadi	215
Concentration Dependent Photocatalytic Degradation of Methylene Blue Using Green Synthesized Fe₃O₄/ Cdots Nanocomposites Utilizing Moringa Oleifera Leaf Extracts C.D. Lestari, N.I. Istiqomah, E.K. Sari, E. Suharyadi and H. Aliah	227
Green Synthesized Fe₃O₄/rGO Nanocomposite for Photodegradation of Rhodamine B I.N. Ramadhani, L.J. Mahardhika, Z. Zurnansyah, P.D. Jayanti, H.P. Kusumah, N.I. Istiqomah, E.K. Sari, D.A. Larasati, N.P. Rini, N.S. Asri, J. Angel and E. Suharyadi	237
Characterization of AC/TiO₂/Fe₃O₄ Nanocomposite on Cork Ball Coating Material as Floating Photocatalyst to Degrade Wastewater F. Choirunnisa, H. Hidayat, N. Mufti, S. Sukarni and H. Setiyanto	247