

Table of Contents

Preface

Chapter 1: Materials for Solar Cells

Inorganic-Organic Hybrid Perovskite Solar Cells Fabricated with Additives Y. Furukawa, S. Ikawa, H. Kiyohara, Y. Sendai and A. Bahtiar	3
Improved the Performance and Stability at High Humidity of Perovskite Solar Cells by Mixed Cesium-Metylammonium Cations A. Bahtiar, R. Yazibarahmah, A. Aprilia and D. Hidayat	9
The Addition of Reduced Graphene Oxide Layer to TiO₂ Photoanode of DSSC Using UV Oven Spraying Method L. Safriani, A. Aprilia, S. Suryaningsih, F. Yuliasari, M.R. Nurawan, A. Nuroctaviani, E. Dina, T. Amelia, N. Syakir and Fitrilawati	15
Effect of Lead-Free Perovskite Cs₂SnI₆ Addition in the Structure of Dye-Sensitized Solar Cell H. Pujiarti, R. Hidayat and P. Wulandari	22
Performance of Air-Stable Cs₂SnI₆ Perovskite as Electron Transport Layer in Inverted Bulk Heterojunction Solar Cell R. Khaeroni, Herman and P. Wulandari	28
Photovoltaic Characterization of Hybrid Bulk Heterojunction Solar Cell Incorporated Gold Nanoparticles Embedded in Active Layer N.F. Syarif, R. Hidayat and P. Wulandari	34
Synthesis and Dispersion of Ni-Doped Cu₂ZnSnS₄ C. Panatarani, H. Redianti, F. Faizal, E. Cahya Prima, B. Yulianto and I.M. Joni	42

Chapter 2: Materials for Batteries and Supercapacitors

Rolled Supercapacitor Device Model Using Carbon-Sheet as Electrodes in KCl Electrolyte System D.U. Dzujah, R. Hidayat, Fitrilawati and N. Syakir	53
Synthesis of Carboxymethyl Cellulose Form Banana Stems and its Characterization for Anode Binder of Li-Ion Battery S. Hidayat, L. Rohmani, B. Adiperdana, F. Faizal, Y.W. Hartati and I. Rahayu	59
The Influence of Mechanical Milling on the Electrical Conductivity of LiFeSi_{0.03}P_{0.97}O₄/C Composite Materials M. Zainuri, H.E. Della and B.A. Subagyo	64
The Effect of Gadolinium Ion Doping on Electronic Conductivity of LiFePO₄/C I. Rahayu, E.E. Ernawati, A.R. Noviyanti, Y. Linda, D. Rakhmawaty, A. Suprabawati, A. Anggraeni, H.H. Bahti and S. Hidayat	69
Active Materials LiFeSi_xP_{1-x}O₄/C as Lithium Ion Battery Cathode with Doping Variations Si Ions (0≤x≤0,06) M. Zainuri, Triwikantoro and P.A. Zahra	75

Chapter 3: Advanced Ceramics

Fe₃O₄.SiO₂: A Study of Structural and Magnetic Properties in Various Volume of Tetraethyl Orthosilicate T. Saragi, H.D. Sinaga, F. Rahmi, G.A. Pramesti, A. Sugiarto, A. Therigan, B. Permana, N. Syakir and R. Risdiana	83
Effect of Different Synthesis Methods on Structural, Morphological and Magnetic Properties of La_{0.7}Ba_{0.25}Nd_{0.05}MnO₃ D.R. Munazat, B. Kurniawan, D.S. Razaq, I.N. Rahman, A. Sudarmaji, D. Handoko, D. Nanto and W.B.K. Putri	89

Structural and Morphological $\text{La}_{0.85-x}\text{Ba}_x\text{Na}_{0.15}\text{MnO}_3$ ($x = 0, 0.05, 0.10$ and 0.15) Perovskite Manganite	
I.N. Rahman, B. Kurniawan, D.S. Razaq, A. Sudarmaji and D.R. Munazat	95
Structure and Morphology of Copper Substituted in $\text{La}_{0.667}\text{Ba}_{0.333}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ ($x = 0.35$ and 0.40)	
R.F. Syahrizal and B. Kurniawan	101
Structure and Morphology Properties of Nanosized $\text{La}_{0.75}\text{K}_{0.05}\text{Ba}_{0.05}\text{Sr}_{0.15}\text{MnO}_3$ Manganite	
D.S. Razaq, B. Kurniawan, I.N. Rahman and D.R. Munazat	106
The Influence of Cu Substitution on the Crystal and Morphological Structure of $\text{Ca}_{0.9}\text{La}_{0.05}\text{Bi}_{0.05}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ ($x = 0, 0.025, 0.05, 0.075$, and 0.1) Manganites	
B.B. Arbianto, B. Kurniawan and A. Sudarmaji	112
Effect of Ni Substitution to Structure and Morphology of $\text{Ca}_{0.9}\text{La}_{0.05}\text{Bi}_{0.05}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ by Sol-Gel Method	
M.A.N. Nur and B. Kurniawan	117
Conductivity of Lanthanum Silicate Apatite Derived from Rice Husk	
A.R. Noviyanti, Y.B. Yuliyati, Solihudin, I. Rahayu, D.G. Syarif and R. Risdiana	122
Particle Size Analysis of the Synthesized Al_2O_3 by Dissolution and Alkali Fusion-Coprecipitation Methods	
C.F.K. Murti, M.A. Baqiya, Endarko and Triwikantoro	128

Chapter 4: Superconductivity and Superconductors

Anisotropy of Lower Critical Field in Organic Layered Superconductor λ-(BETS)$_2$GaCl$_4$	
D.P. Sari, N. Rui, K. Hiraki, T. Nakano, M. Hagiwara, Y. Nozue, T. Kusakawa, A. Hori, I. Watanabe and Y. Ishii	137
Variable Range Hopping Resistivity in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ Nanoparticles Evaluated by Four Point Probe Method	
S. Winarsih, F. Budiman, H. Tanaka, T. Adachi, T. Goto, B. Soegijono, B. Kurniawan and I. Watanabe	142
The Dependence of Magnetic Moments on Magnetic Impurities of Ni in $\text{Eu}_{1.86}\text{Ce}_{0.14}\text{Cu}_{1-y}\text{Ni}_y\text{O}_{4+a-d}$	
M.A. Syakuur, Y. Maryati, U. Widyaiswari, D.P. Sari, T. Saragi and R. Risdiana	148
Spin Alignment Studies on the Muon-Site Determination in La_2CuO_4	
M.R. Ramadhan, I. Ramli, D.P. Sari, B. Kurniawan, A. Manaf, M.I. Mohamed-Ibrahim, S. Sulaiman and I. Watanabe	154
Study of Purity and Electrical Resistivity of $\text{Eu}_{1.91}\text{Ce}_{0.09}\text{CuO}_4$ and $\text{Eu}_{1.84}\text{Ce}_{0.16}\text{CuO}_4$	
Y.R. Tayubi, Y. Maryati, N. Nafisah, D.G. Auliya, E. Nurwati, T. Amalia, M.A. Syakuur, Wiendartun, S. Feranie, T. Saragi and R. Risdiana	160
The Effect of Interaction Weight on Dipole Field Calculations to Reconstruct the La_2CuO_4 μSR Spectrum	
B. Adiperdana and R. Risdiana	165

Chapter 5: Carbon Materials

Synthesis of High Quality Porous Carbon from Water Hyacinth	
O. Nurhilal, R.S. Lesmana, K. Ramadayanti, S. Habibah, S. Hidayat, D. Sumiarsa and R. Risdiana	173
Carbon Extraction from Rice Husk and its Application as a Microwave Adsorbent	
Yusmaniar, S. Juwita, W.A. Adi, M.R. Fuazi and E. Handoko	178
Electronic Properties of Nitrogen- and Boron-Doped Amorphous Carbon (a-C:N and a-C:B) Films from Palmyra Sugar	
A.Z. Laila, K. Nadiyyah, I.S. Ardiani, B. Priyanto and Darminto	185
Structural Analysis of Boron- and Nitrogen-Doped Amorphous Carbon Films from Bio-Product	
I.S. Ardiani, K. Nadiyyah, A.Z. Laila, S. Tunmee, H. Nakajima, B. Priyanto and Darminto	190
Electrical Characterization of N- and B- Doped Amorphous Carbon Film from Palmyra Sugar	
K. Nadiyyah, A.Z. Laila, I.S. Ardiani, B. Priyanto and Darminto	196

Chapter 6: Materials for Biomedical Application

Synthesis and Characterization of Zn-Mg Alloys as Biodegradable Materials A. Supardi, S. Willy and D. Hikmawati	205
Characterization of Microstructure and Composition of Plasma Electrolytic Oxide Film Formed on AZ31 Mg Alloy E. Hidayati and A. Anawati	213
Effect of Solution Treatment on Microstructure and Mechanical Hardness of Ti-6Al-7Nb D. Maharani, A. Anawati, I.N. Jujur and Damisih	218
Fabrication of Compact Magnesium Disk by Spark Plasma Sintering D. Wirani, A. Anawati and T. Sudiro	223
The Effect of Temperature Synthesis on the Purity and Crystallinity of Hydroxyapatite A. Yusuf, N.M. Muhammad, A.R. Noviyanti and R. Risdiana	228
Synthesis of Polydimethylsiloxane and its Monomer from Hydrolysis of Dichlorodimethylsilane S. Setiadji, E. Sumiyanto, Fitrilawati, N. Syakir, A.R. Noviyanti, I. Rahayu and R. Risdiana	234
Fabrication of Hydroxyapatite Coating on Commercially Pure Ti by Electrophoretic Deposition Technique S. Rahmadani, A. Anawati, I.N. Jujur and R. Hanafi	239
The Effect of Ultraviolet Exposure on Physical Properties of Electrospun Nanofiber Membrane Based on Polyvinyl Alcohol and <i>Aloe vera</i> D. Hikmawati, N.P. Maharani, A.P. Putra and Siswanto	244

Chapter 7: Functional Materials

Palladium Role in Growth of ZnO Nanostructure with Plasmonics Layering by Seed Mediated Hydrothermal Method Y. Albaihaqi, R. Abdi, S. Natalia, R.F. Syahputra, A. Awitdrus and I. Iwantono	253
Absorption Electromagnetic Waves in X-Band Range Using Barium M-Hexaferriite Dopping Zn Ions and Polyaniline Conductive with Variation of Thickness Coating M. Zainuri, Triwikantoro and D.A. Primadani	260
The Effect of Variation Concentration Sodium Hydroxide (NaOH) on the Structure of Calcium Carbonate (CaCO₃) Based on Natural Sand L. Silvia, Amilia, L. Awathifi, Mashuri, Z. Arifin, B.A. Subagyo, H. Sukamto, S.Y. Purwaningsih, Y.D. Hapsari, Sudarsono, Mariyanto, M.A. Baqiya, Y. Cahyono and M. Zainuri	267
ZnO Thin Films Prepared Using the Ultrasonic Spray Pyrolysis Method for High Performance Metal Oxides-Based Photoconductors N.A. Putri, C. Imawan and V. Fauzia	274
Basis Set Effects in Density Functional Theory Calculation of Muoniated Cytosine Nucleobase W.N. Zaharim, S. Sulaiman, S.S. Mohd Tajudin, S.N. Abu Bakar, N.E. Ismail, H. Rozak and I. Watanabe	282
Magnetic Properties of Pyrochlore Ruthenate Nd₂Ru₂O₇ Studied by μSr U. Widyaiswari, H. Sakai, K. Inoue, N. Hanasaki, D.P. Sari, B. Kurniawan and I. Watanabe	288

Chapter 8: Polymers and Composites

Temperature in the Extraction Process: The Number of Cavities Created in Polymer Based on Molecularly Imprinted Polymer (MIP) Caffeine I. Royani, J. Rahmayani, Maimuna, E. Koriyanti, Jorena, K. Saleh and F. Monado	297
Metal-Polymer Composite as an Acoustic Attenuating Material for Ultrasonic Transducers D. Hidayat, N.S. Syafei, B.M. Wibawa, M. Taufik, A. Bahtiar and R. Risdiana	303
Morphology of Micro-Porous Membrane of Waste Cigarette Butts Using Phase Inversion Method Setianto, L.K. Men, A. Bahtiar, B.M. Wibawa and D. Hidayat	310

Effect of Concentration and Nozzle-Collector Distance on the Morphology of Nanofibers I. Fatimah, T.I. Sari and D. Anggoro	315
Electrodepositing Ni-TiN/Si₃N₄ Composite Layer with Variation of Current Density E. Budi, Y. Oktaviani, A. Fikry, W. Indrasari, I. Sugihartono and T.B. Prayitno	320

Chapter 9: Materials and Technologies for Environmental Engineering

Study of Low Temperature Preparation of Al Doped ZnO Powder and its Photocatalytic Properties A. Aprilia, D.P. Hanavi, C. Ghina Afrilia, A. Bahtiar, S. Suryaningsih and L. Safriani	329
Feasibility of Ceria Nanocrystal Adsorbent for Amoxicillin Removal from Water I. Nurhasanah, Kadarisman, V. Gunawan and H. Sutanto	338
The Effect of Fermentation Process on Physical Properties of Organic Material from Domestic Food Waste Y. Andriani, W. Lili, I. Zidni, M.F. Wiyatna and R. Risdiana	345
Carbon Nanofibers Form by Electrospinning with Flowrate Variations as Electrodes for Capacitive Deionization D. Anggoro, I. Muhlas and I. Fatimah	351