

Table of Contents

Preface

Chapter 1: Materials for Application in Electrical Engineering, Electronics and Spintronics

Investigation of Nano-Sized Al_2O_3 on Pr-Sr-Mn-O Composites: Structural, Microstructural and Magnetic Properties	
L.K. Pah, L.N. Lau, M.M.A. Kechik, S.K. Chen, S.A. Halim and N.S. Badron	3
Structural, Magnetic and Magnetotransport Properties of Sol-Gel Synthesized $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3:\text{TiO}_2$ Nanocomposite	
L.N. Lau, L.K. Pah, M.M.A. Kechik, S.K. Chen, N.B. Ibrahim, S.A. Halim and S.Y. Lai	9
Solderability of Coloured Lead Free Solder Composite	
M. Abu Bakar, A. Jalar, N. Ismail, A.G. Ismail and N.S. Ibrahim	15
A Study of Multiferroic BiFeO_3/Epoxy Resin Composite as Potential Coating Materials for Microwave Absorption	
S.N.A. Rusly, I. Ismail, K.A. Matori, Z. Abbas, A.H. Shaari and I.R. Ibrahim	20
Morphological Effect on the Intermetallic Compound Layer Growth Kinetics of Metallurgical Joining	
A. Jalar, M. Abu Bakar, M.Z.A. Razak and N. Ismail	26
Effect of Blast Wave on Intermetallics Formation, Hardness and Reduced Modulus Properties of Solder Joints	
N.S. Safee, W.Y. Wan Yusoff, A. Ismail, N. Ismail, M. Abu Bakar and A. Jalar	31
The Effect of Various ZnO Layer towards Sensing Performance as an Electrolyte-Insulator-Semiconductor pH Sensor	
E.M. Al-Khalqi, M.A.A. Hamid, R. Shamsudin, N.H. Al-Hardan and L.K. Keng	37
The Study of a Structural and Electronic Properties of Two-Dimensional Flat Layer Arsenene Using Planewaves Density Functional Calculation	
A.N. Rosli, M.M. Anas and H. Saadiah	45
Zinc Oxide Thin Film Synthesized by Sol-Gel Method	
A.A.N. Hakim, A.R.A. Rashid, N. Arsad and A.H. Surani	51
Synthesis and Characterization of Cobalt Ferrite Nanoparticles via Sol-Gel Auto Combustion Method	
C.Z. Najeehah, K.T. Chaudhary and J. Ali	58
Self-Catalysed Vapor-Liquid-Solid Growth Mechanism of ZnO Nanowires Grown on Silicon Substrate Pre-Coated with ZnO Buffer Layer	
N. Jamaludin, S. Sakrani, K.T. Chaudhary, J. Ali and F.D. Ismail	64
ZnO Coated Optical Fiber for Alcohol Sensing Applications	
A.R.A. Rashid, A.N.A. Latiff, W.M. Mukhtar, N.A.M. Taib, S. Suhaimi and K.A. Dasuki	70
Graphene Based Macrobend Unclad SMF for Monitoring pH Level in Aqueous Environment	
W.M. Mukhtar, S.N. Latib, R.M. Halim and A.R.A. Rashid	78
Plastic Optical Fiber Sensor for Detection of Ethanol Concentrations	
A.H. Surani, A.R.A. Rashid, N. Arsad and A.A.N. Hakim	84

Chapter 2: Superconducting Materials

Electrospinning Synthesis of Bi-2223 Superconducting Nanowires	
B.A. Balasan, A. Hashim, M.H. Mazwir and F.H. Zulkifli	93
Effect of $\text{Ni}_{0.5}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$ Nanoparticles Addition on Tl-1212 High Temperature Superconductor	
W. Kong, C. Jacob, I. Kong, C. Kong, E.H. Yap and R. Abd-Shukor	98
Effect of CeO_2 Nanoparticle on the Structural and Electrical Properties of BSCCO-2223 High Temperature Superconductor	
E.S. Nurbaisyatul, H. Azhan, A. Kasim and N. Ibrahim	104

Chapter 3: Materials and Technologies for Application in Energy Storage

Effect on Electrochemical Performance of Cr and Ni Substitution in LiCoO₂ Cathode Materials	
N.S.S. Mohd Abdillih, N. Kamarulzaman, K. Elong and M.S. Mastuli	113
Structural Studies and Ionic Transport Properties of Solid Biopolymer Electrolytes Based on Chitosan/ Methyl Cellulose Blend Doped with BMIMTFSI	
M.S.M. Misenan and A.S.A. Khair	119
Scan Rates and the Disparities in the Electrochemical Double Layer Capacitor (EDLC) Performance	
L. Sa'adu and M.A. Hashim@Ismail	125
The Influence of Structural Properties on the Electrochemical Performance of Surface-Modified Ordered Carbon	
N.I.H. Razman, S. Endud, I.I. Misnon and N. Nordin	131
The Effect of Calcination Time on Crystallite Size of LiMn_{1.8}Ni_{0.2}O₄ Cathode Materials	
M. Matius, N. Kamarulzaman, M.S. Mastuli, N.S.S.M. Abdillih and K. Elong	136

Chapter 4: Materials and Technologies for Fuel Cell Production

Fabrication of Compositionally Gradient Anode Functional Layer for Proton Conducting Fuel Cell at Intermediate Temperatures: A Preliminary Study	
L.A. Malik, S.M. Senari, O.H. Hassan, A.M.M. Jani, N. Osman and M. Suklueng	143
Lattice Expansion of BaCe_{0.54}Zr_{0.36}Y_{0.1}O_{3-δ} Ceramic Electrolyte	
N.W. Mazlan, N. Osman, O.H. Hassan and Z. Mohamed	149
Characterization of LSCF Cathode Material Modified with f-CNTs	
N.I.A. Malek, I. Ismail and N. Osman	154
Electrical Conductivity of Y³⁺ Doped Ba(Ce,Zr)O₃ in Wet N₂ Atmosphere Prepared with the Addition of Brij-97	
N.S. Mohd Affandi, N. Osman and O.H. Hassan	160
Characterization of BCZY Ceramic Material Prepared with Treated Activated Carbon from Empty Fruit Bunches (EFB)	
N.A. Mahmud, N. Osman and A.M. Md Jani	166
Phase Analysis of Cerate and Zirconate Ceramics Powder Prepared by Supercritical Ethanol Using High Temperature-High Pressure Batch Wise Reactor System	
N. Osman, N.W. Mazlan, O.H. Hassan, W.Z. Wan Zulkifli and Z. Mohamed	171

Chapter 5: Materials and Technologies for Application in Solar Cell and Photocatalysis Processes

Effect of Heat Treatment on Electrodeposited ZnSe on Vertically Aligned ZnO Nanorods for Photoelectrochemical Cell	
L.M. Fudzi, Z. Zainal, H.N. Lim, S.K. Chang and A. Samsudin	179
Characteristics of Electron Transport Study of Composited Graphene-Zinc Oxide Thin Film Photoanode for Dye-Sensitized Solar Cells	
N.S. Samsi, N.A.S. Affendi, M.K. Yaakob, M.F.M. Taib, A. Lepit, O.H. Hassan, M.Z.A. Yahya and A.M.M. Ali	185
Optimization of Dye Extraction from Purple Cabbage and Cordyline Fruticosa in Dye-Sensitized Solar Cell	
A.K. Rosli, S. Suhaimi, M.A. Hashim@Ismail, N.M. Yatim and N. Hamid	192
Potassium Doping Effect on Cu₂ZnSn(S,Se)₄ Thin Film Absorber Layer Deposited via Spray Pyrolysis	
M.S. Salleh, K.T. Chaudhary, E. Mazalan and J. Ali	201
Determination of HOMO and LUMO Level of Polythiophene, Poly(3-Thiophene Acetic Acid), Polypyrrole and Chlorophyll via Cyclic Voltammetry Method	
H. Salleh, N. Ali, C.C. Yap, A.M. Sinin, N. Ishak, N.H. Kamarulzaman, S.M. Ghazali and N.A. Nik Ali	207

Antimicrobial Activity of Photoactive Cerium Doped Zinc Oxide M.S. Rooshde, W.R.W. Abdullah, A.Z. Amran, N.F. Ibrahim, F. Ariffin and M.S.M. Ghazali	217
Temperature and Salinity Effects on Photocatalytic Performance of Cerium Doped Zinc Oxide W.R.W. Abdullah, L.C. Siang, M.S. Rooshde and M.S.M. Ghazali	223

Chapter 6: Environmental Treatment Technologies and Chemical Production

Determination of Cadmium Ions Using Schiff-Base Modified Carbon Paste Electrode: A Box-Behnken Design Approach A. binti Azhari, R.A. Wahab and R. Ahamad	231
Removal of Copper Ions from Aqueous Solution Using Waste Mill Scales A.N. Nur Asyikin, R.S. Azis, S. Sulaiman, N.A. Azuan, A.H. Shaari, H.C. Man, I. Ismail, I.R. Ibrahim and N.M. Saiden	247
Gelation Behavior of Polyacrylamide Reinforced with Nano-Silica for Water Shutoff Treatment in Oil Field N.A. Fadil, S. Irawan, N.A. Mohd Isa and S.R. Shafian	252
Gas Permeation Properties of Multiwalled Carbon Nanotubes on Polyether Block Amide (Pebax-1657)/Polyethersulfone(PES) Blend Mixed Matrix Membrane for CO₂/CH₄ Separation N. Fazil, H. Mukhtar, D.F. Mohshim and R. Nasir	258
Effect of Addition of Polyethylene Glycol into Trivalent Chromium Bath on Chromium Coating E. Tey, Z. Zainal, L.K. Pah and I. Ismail	264

Chapter 7: Functional Materials

Band Gap Narrowing of MgO and Mg_{0.95}Zn_{0.05}O Nanostructures N.F. Chayed, N. Badar, K. Elong and N. Kamarulzaman	273
Pulsed Laser Ablation Produced Copper Nanoparticles (CUO NPS): The Influence of Time N.N. Adnan, S.N. Ab Razak, M.S. Roslan, N.A.M. Taib, H. Nurhafizah and N.B. Amran	279
Corrosion Inhibition Properties of Epoxy-Zinc Oxide Nanocomposite Coating on Stainless Steel 316L N.F. Ibrahim, W.R. Wan Abdullah, M.S. Rooshde, M.S. Mohd Ghazali and W.B. Wan Nik	285
Sound Absorption Characteristics of a Single Micro-Perforated Panel Backed by a Natural Fiber Absorber Material M. Rusli, F. Rahman, H. Dahlan, Gusriwandi and M. Bur	291
PCM-Based for Heat Storage in Solar-Thermal Converter N.M. Yatim, S.R.M. Nizar, M.A. Hashim@Ismail and S. Suhaimi	297

Chapter 8: Functional Glasses and Glass-Ceramics

Physical, Absorption and Photoluminescence Performance of Eu³⁺ Doped Lithium Chloride Tellurite Glass S.N.S. Yaacob, M.R. Sahar, S.A. Jupri, E.S. Sazali, R. Zainal and P. Marwoto	307
Luminescence Properties of Magnesium Sodium Borate Glasses Doped Sm³⁺, Dy³⁺ and Eu³⁺ A.R. Tamuri, A.A. Majid and R. Husin	314
Elastic Properties of Vanadium Doped Silica-Borotellurite Glasses N.M. Nor, H.M. Kamari, A.A. Latif and N.M. Shah	321
Physical, Mechanical and Structural Properties of Yttrium Oxide Doped Zinc Borate Glasses N.H. Afrizal, N. Yahya, N.M. Yusoff, A. Kasim and A. Hashim	327

Chapter 9: Biomaterials

Biocompatible Hydroxyapatite Derive from Selayang Fish Bone via Mechanochemical Treatment	
A.Q. Ishak, N.A. Nik Ali, A.M.S. Nurhaziqah and H. Salleh	339
Poly(N-Isopropylacrylamide) Microgel Synthesised by Emulsion Polymerization	
H.N.E. Yong, K.Y. Tshai, S.S. Lim and I. Kong	345
Effect of Temperature and Frequency on the Acoustic Properties of Konjac Glucomannan-Agar Gels as Tissue Mimicking Materials	
A.N. Mat Daud, M.S. Rohani and R. Jaafar	351