

Table of Contents

Preface

Chapter 1: Ferrites and Manganites

Effect of Fe³⁺ Partial Substitution at Mn-Site on Electroresistance Behaviour in La_{0.7}Ba_{0.3}Mn_{1-x}Fe_xO₃ (x = 0 and 0.02) Manganites	3
M.S. Sazali, N. Ibrahim, Z. Mohamed, R. Rajmi and A.K. Yahya	
Effect of Fe Doping on the Structural, Electrical and Magnetic Properties of Perovskite La_{0.7}Ca_{0.3}Mn_{1-x}Fe_xO₃ (X = 0, 0.01, 0.03 and 0.05)	10
N.A. Nik-Jaafar, R. Abd-Shukor and M.A. Kamarudin	
Electroresistance Effect due to Mo Substitution at Mn-Site in Monovalent Doped La_{0.85}Ag_{0.15}Mn_{1-x}Mo_xO₃ (x = 0.00 and 0.05) Manganites	17
M.S. Mohd Sabri, N.A.A. Che Apandi and N. Ibrahim	
Microwave Absorption Properties of Monovalent Doped La_{0.85}Ag_{0.15}MnO₃ Manganites Prepared by Solid State Method	22
N.A.A. Che Apandi, N. Ibrahim, Z. Awang, R.S. Azis, M.S. Mustaffa and A.K. Yahya	
Band Structure and Thermoelectric Properties of Ni_(x)Zn_(1-x)Fe₂O₄	28
J.H. Lim	
Structural and Dielectric Analysis of La_{0.88}Bi_{0.12}Mn_{0.80}Ni_{0.20}O₃ Composite	35
A.E. Sinin, W.C. Primus, Z.A. Talib, C.S. Kien, A.H. Shaari, S. Hamdan and Z. Zainuddin	
Synthesis and Characterization Barium M-Hexaferrites (BaFe_{12-2x}Co_xMn_xNi_xO₁₉) as a Microwave Absorbent Material	46
S. Hambali and A. Doyan	
Structural and Optical Properties of BiFeO₃ via Polymer-Assisted Hydrothermal Synthesis under Different Weight of Chitosan	53
M.S. Sazali, M.K. Yaakob, M.H. Mamat, O.H. Hassan and M.Z.A. Yahya	
Effect of TiO₂ Nanoparticle on the Structural and Electrical Properties of Nd_{0.67}Sr_{0.33}MnO₃/TiO₂ Composites	60
K.P. Lim, L.N. Lau, A.N. Ishak, M.M.A. Kechik, S.K. Chen, A.H. Shaari and W.T. Chong	
Structural and Electrical Properties of La_{0.7}Ca_{0.3}MnO₃ /α-Fe₂O₃ Composites	66
L.N. Lau, K.P. Lim, A.N. Ishak, M.M.A. Kechik, S.K. Chen, N.B. Ibrahim, A.H. Shaari and E. Lim	

Chapter 2: Glass and Ceramics

Linear Shrinkage, Strength and Porosity of Alumina-Based Ceramic Foam with Corn Starch as Pore Former	75
N.F.A. Rahman, H.A. Rahman, W.M.S.W. Azhan and N.H. Yatim	
Comparative Spectroscopic Studies on Luminescence Performance of Er³⁺ Doped Tellurite Glass Embedded with Different Nanoparticles (Ag Co and Fe) at 0.55 μm Emission	81
S.N.S. Yaacob, M.R. Sahar, F.M. Noor, N.L.A. Rodin, S.K.M. Zain, P.A. Buchori, S.M. Aziz, N.M. Yusoff and S. Sulhadi	
Optimum Lasing Cavity for Erbium Doped Zinc Tellurite Glass Rods Embedded with Ag Nanoparticles	87
N.A.M. Adnan, M.R. Sahar and E.S. Sazali	
The Optical Performance of Holmium Oxide Doped Tellurite Glass for Potential Optical Fiber	95
M.N. Abd Azis, H.M. Kamari, A.B. Suriani, A. Yahya and U.S. Aliyu	
Effect of Samarium Ions on Physical and Optical Properties of Zinc Borotellurite Glass System	100
S.N. Mohd Rafien, A. Kasim, N. Yahya, A. Hashim and W.A. Wan Razali	
Fabrication of Silica (SiO₂) Foam from Rice Husk Ash (RHA): Effects of Solid Loadings	109
R. Muda, H.A. Rahman, M.A. Azmi, S. Ahmad, S. Mahzan and H. Taib	

Chapter 3: Functional Nanomaterials and Nanotechnologies

Assessment of Magnetic Properties between Fe and Ni Doped ZnO Nanoparticles Synthesized by Microwave Assisted Synthesis Method S.S. Abdullahi, G.S.M. Galadanci, N.M. Saiden and J.Y.C. Liew	119
Enhanced Transport Critical Current Density of Tl-1212 Bulk Superconductor Added with Nickel-Zinc Ferrite Nanoparticles W. Kong, N.A. Khalid, W.N.T. Nizam, K.Y. Tshai, I. Kong, E.H. Yap and R. Abd-Shukor	125
Synthesis and Characterization of Low Density Bi-2223 Cuprates Superconductor Doped Eu₂O₃ Nanoparticles N.E. Suhaimi, A. Hashim, A. Kasim, N. Ibrahim and S.F. Saipuddin	131
Spheroid Nickel Nanoparticles Synthesized in CTAB Solution Using Gamma Radiation S.I. Ahmad, S. Rahim, S.A. Shamsudin, A. Mohamed Noor, F.C. Ros and F.W. Badrudin	138
Microcrystalline Cellulose as Graphite Exfoliation Agent and its Effect on Electrical Conductivity A.H. Azmi, S.F. Abd Rahman and M.S. Zainal Abidin	144
Synthesis and Characterization of Copper Selenide and Tin Selenide Powders by Mechanical Alloying Method L.Y. Nee, Z.A. Talib, Z. Zainal and J.L.Y. Chyi	152
Synthesis of Silver Nanoparticles by Plasma-Assisted Hot-Filament Evaporation for Enhancing in Luminescence Properties of Organic Light Emitting Diode A.H.H. Al-Masoodi, B.T. Goh, A.H.H. Al-Masoodi and W.H.A. Majid	157
The Study of Platinum Coated Carbon Nanotubes as Third-Order Nonlinear Optical Materials N.A. Ahmad Shah, S.Z.N. Demon, F.N. Diauddin, N. Kasim, N. Abdullah and G. Krishnan	166
Influence of Zr Additive on the Chemical Reduction Behaviour of MoO₃ in Carbon Monoxide Atmosphere A. Samsuri, M.N. Latif, N. Dzakaria, F. Salleh, M.A. Abu Tahari, T.S. Tengku Saharuddin and M.A. Yarmo	173
Nanocellulose-Based Filters as Novel Barrier Systems for Chemical Warfare Agents M.N.F. Norrrahim, N.A. Ahmad Shah, S.H. Jamal, W.M.Z.W. Yunus, V.F.K.V. Ernest and N.A.M. Kasim	180

Chapter 4: Materials for Sensing Technologies

Morphology Studies of SWCNT Dispersed in Conducting Polymer as Potential Sensing Materials N.S.N. Sa'aya, S.Z.N. Demon, N. Abdullah and N. Abdul Halim	189
Multi-Walled Carbon Nanotubes Functionalized with Carboxyl and Amide for Acetone detection at Room Temperature N. Janudin, N. Abdullah, F. Md Yasin, M.H. Yaacob, M.Z. Ahmad and N.A.M. Kasim	195
Supramolecular Interactions in Aromatic Structures for Non-Optical and Optical Chemosensors of Explosive Chemicals J. Matmin, N.F. Ghazalli, F.I. Abdul Razak, H.O. Lintang and M.A. Jalani	202
Facile Synthesis and Characterizations of Silver Nanoparticles-Reduced Graphene Oxide Hybrid N.I. Ikhsan and N.A.M. Zamri	208

Chapter 5: Biomaterials

Synthesis, Characterization and Bioactivity of Chitosan Hydroxyapatite Composite Doped with Strontium I. Abdullahi and I. Zainol	217
In Vivo Toxicity Assessment of Nickel Zinc Carbon Nanotubes in a Living Host Model C. Kong, S.S.S. Azizan, A.B. Kakarla, I. Kong and W. Kong	227

Synthesis of Calcium/Aluminium-Ciprofloxacin-Layered Double Hydroxide for a New Antibacterial Drug Formulation
M.L. Jadam, Z. Jubri and S.H. Sarijo

233

Chapter 6: Materials and Technologies for Environmental Engineering

Feasibility of Irradiated Corn-Based Bioplastics as Packaging Material N.N. Nasir and S.A. OTHMAN	241
Synthesis of Carbide Lime Derived Strong Base Catalyst for Biodiesel Production L.H. Hua, F.L. Pua, R. Othman, T.Y.Y. Hin and S. Nabihah	251
Photocatalytic Degradation of Methylene Blue by TiO₂- Graphene Composite S. Razak, O.S. Hin and R. Hamzah	257
Cellulose Nanofiber as Potential Absorbent Material for Chloride Ion M.S.M. Misenan, N. Janudin, M.A. Idayu, M.N.F. Norrrahim, S.H. Jamal, W.Y. Wan Yusoff, N. Kasim, W.M.Z.W. Yunus, V.F.K.V. Ernest and N.A.M. Kasim	263
Rapid Adsorption of Magnetite Nanoparticles from Recycled Mill Scale Waste as Potential Adsorbent for Removal of Cu(II) Ions S. Sulaiman, R.S. Azis, I. Ismail, H.C. Man and N. Rosdi	270
Comparative Study on Micronized and Nanosized <i>Carica papaya</i> Seed Modified Pullulan as Biocoagulant in Wastewater Treatment D.J. Lie, M. Ahmad and N.S. Azhar	276
Study on the Effect of Applied Pressure on Iron and Manganese Rejection by Polyamide and Polypiperazine Amide Nanofiltration Membranes N. Kasim, E. Mahmoudi, A.W. Mohammad and S.R. Sheikh Abdullah	283

Chapter 7: Polymers and Composites

Fatigue Crack Growth of Natural Rubber/Butadiene Rubber Blend Containing Waste Tyre Rubber Powders D.H.A.I. Hassim, F. Abraham, J. Summerscales and P. Brown	293
Enhancement of Heat Ageing Properties of Epoxidised Natural Rubber Blend M.M. Kamal	300
Conversion of Bacterial Cellulose to Cellulose Nitrate with High Nitrogen Content as Propellant Ingredient S.H. Jamal, N. Jori Roslan, N.A. Ahmad Shah, S.A. Mohd Noor, O.K. Khim and W.M.Z. Wan Yunus	305
Preliminary Study on the Effect of Sulphuric Acid to Nitric Acid Mixture Composition, Temperature and Time on Nitrocellulose Synthesis Based <i>Nata de Coco</i> N. Jori Roslan, S.H. Jamal, K.K. Ong and W.M.Z. Wan Yunus	312
Effect of Fabrication Method on Tensile Behaviour of Polysiloxane (POS) Filled Rice Husk Silica (RHA SiO₂) Composites M.A. Azmi, S.M. Yahya, S. Ahmad, S. Mahzan, H.A. Rahman, N.A. Baharuddin, H. Zakaria, S. Hassan and H. Taib	320
Purification on Kappa Carrageenan by Re-Precipitation Technique N. Shrgawi, I.J. Shamsudin, H. Hanibah, S.A. Mohd Noor and N. Kasim	327
Thermomechanical Study and Thermal Behavior of Plasticized Poly(Lactic Acid) Nanocomposites M. Zorah, I.R. Mustapa, N. Daud, N. Jumah, N.A.S. Sudin, A. Majhool and E. Mahmoudi	333
Thermomechanical Properties and Thermal Behavior of Poly(Lactic Acid) Composites Reinforced with TiO₂ Nanofiller N.A.S. Sudin, N. Daud, I.R. Mustapa and M. Zorah	341
Thermomechanical, Crystallization and Melting Behavior of Plasticized Poly(Lactic Acid) Nanocomposites N.A.S. Sudin, I.R. Mustapa, N. Daud and M. Zorah	351
Acoustic Performance Mixture of Natural Fibres of Oil Palm Frond (OPF) and Empty Fruit Bunch (EFB) M.R. Chandran, E.L. Sheng, Y.W. Kean, M.N. Nasir and Z. Ibrahim	361

Localized Deep and Shallow Traps of α -Peaks from Thermally Stimulated Current (TSC) Measurement on Thermoplastic Polymers

N.A. Halim, S.Z.N. Demon, N. Abdullah, N. Ahmad and Z.H.Z. Abidin

369

Investigation on the Dielectric Properties of Palm Oil with Silicon Carbide Doping for Transformer Application

M.F. Md Din, N.S. Mazlan, A.R.A. Rahman, M.T. Ishak, N.S. Suhaimi and F.R. Hashim

377

Chapter 8: Batteries and Fuel Cells

Electrical and Electrochemical Studies of Polymer Gel Electrolytes Based on Agarose-LiBOB and P(VP-co-VAc)-LiBOB

M.S.S. Ari, S.Z.Z. Abidin, M.F.M. Taib and M.Z.A. Yahya

385

Physical and Electrical Studies of High Molecular Weight Poly (Methyl Methacrylate) Based Solid Polymer Electrolytes

N. Azhar, A.M.M. Ali, R. Zakaria, M.F.M. Taib, O.H. Hassan and M.Z.A. Yahya

393

***Ab Initio* Study on Structural Properties of NaFeSO₄OH Cathode Material for Rechargeable Sodium Ion Battery**

A. Idrus, F.W. Badrudin, M.F.M. Taib, O.H. Hassan, A.M.M. Ali and M.Z.A. Yahya

400

Structural and Conductivity of NiO-BCZY Anode Functional Layer for Proton Conducting Fuel Cell

L.A. Malik, N.W. Mazlan, N.N. Mohd Tahir, O.H. Hassan, A.M.M. Jani and N. Osman

406

The Impact of Zr Substitution on the Crystal Structure of Yb Doped BaCeO₃ Solid Solution Prepared by a Sol-Gel Method

N. Osman, N.W. Mazlan, O.H. Hassan and Z. Mohamed

412

Perovskite-Type Oxide-Based Dual Composite Cathode for Solid Oxide Fuel Cells: A Short Review

N.F.A. Rahman, H.A. Rahman and M.A. Azmi

417

The Effect of Ammonium Bromide on Methylcellulose Biopolymer Electrolytes for Electrical Studies

S.N. Abd Majid, A.Q. Ishak, N.A. Nik Ali, M.Z. Daud and H. Salleh

426

Properties of Gel Polymer Electrolyte Based Poly(Vinylidene Fluoride-co-Hexafluoropropylene) (PVdF-HFP), Lithium Perchlorate (LiClO₄) and 1-Butyl-3-Methylimidazoliumhexafluorophosphate [PF₆]

S.A. Mohd Noor, C.P. Wong, M.Z. Dzulkipli, M.S. Su'ait, L. Tian Khoon and N.H. Hassan

434

Poly(Vinyl Alcohol)/ N-Methylene Phosphonic Chitosan/ 2-Hydroxyethylammonium Formate (PVA/NMPC/2-HEAF) Membrane for Fuel Cell Application

S.A. Mohd Noor, L. Tian Khoon, M.S. Su'ait, S. Yook Peng, K.S. Loh and A. Ahmad

440

Effect of pH Value on the Synthesis of NiO Nanoparticles and Microstructure of NiO Based Composite Anode

N.H.A. Zakaria and N. Osman

447

Chapter 9: Thin Films

Vibrational Spectroscopy Analysis of Oligothiophene Blend Film

S.Z.N. Demon and N.A. Poad

457

Influence of Applied Potential on Electrodeposited ZnSe/ZnO Nanostructured Films for Photoelectrochemical Cell

L.M. Fudzi, Z. Zainal, H.N. Lim, S. Shafie and S.K. Chang

463

Influence of Various Target to Substrate Distances on the Structural and Optical Properties of Sputtered Gd-Doped ZnO Thin Films

N.A. Raship, S.N.M. Tawil, N. Nayan, K. Ismail, M. Tahan and A.S. Bakri

471

The Optical Properties of Thin Films Tin Oxide with Triple Doping (Aluminum, Indium, and Fluorine) for Electronic Device

A. Doyan, Susilawati, M. Taufik, S. Hakim and L. Mulyadi

477

The Effect of pH and Monomer Concentration on Polyaniline Thin Films Grown Using Electrodeposition

N.A. Shaari and N.A. Abdul-Manaf

483

Chapter 10: Coatings and Surface Engineering

Effect of pH and Immersion Time on the Corrosion Protection of SDBS:ZnSO₄ Pretreated Mild Steel in Sodium Chloride Solution	
I. Ismail, M.K. Harun and M.Z.A. Yahya	491
Corrosion Inhibition of Mild Steel by Electrodeposited Poly(M-Aminophenol) Coating	
S.M. Yahaya, M.K. Harun, I. Ismail and R. Ramli	498
Effect of Mechanical Agitation on Cr-Al₂O₃ Nanocomposite Coatings Fabricated from Trivalent Chromium Electrodeposition	
E. Tey, Z. Zainal, L.K. Pah and I. Ismail	506

Chapter 11: Structural Materials

Effect of Cooling Rate on the Volume Fractions of the Constituent Phases of the Tempcore Steel Rebars	
M.K. El-Fawkhry, A.M. Fathy and A. El-Sherbiny	517
The Effect of Blast Exposure Distance on Hardness and Reduced Modulus Properties of Lead-Free Solder	
W.Y. Wan Yusoff, N.S. Safee, A. Ismail, N. Ismail, M. Abu Bakar and A. Jalar	523
Compressibility Characteristics of Peat Soil Treated with MUF-P Resin	
M.N. Mohd Daud and N.N. Nik Daud	529
Effect of Gamma Radiation on Micromechanical Behaviour of SAC305 Solder	
N.F. Rahmat, W.Y. Wan Yusoff, A. Jalar, A. Amat, I.A. Rahman and N.S. Ibrahim	535

Chapter 12: Computational Methods and Numerical Investigation

Effect of Vanadium Doping on Thermoelectric Properties of CaMnO₃ Using First Principle Calculations	
A. Chik, R.M. Zaki, A.A. Adewale, F.C. Pa and Y.C. Keat	543
Structural and Electronic Properties of Ag-Doped in Ba-Site of YBa_{2-x}Ag_xCu₃O_δ Using Density Functional Theory via First Principle Study	
S.F. Saipuddin, M.S. Mahmood, A. Hashim, N.E. Suhaimi and M.F.M. Taib	549
Studying the Dynamics and Complexity of a 3D Laser Plasma System	
M.F.A. Rahim, H. Natiq and N.A.A. Fataf	556