

Table of Contents

Preface

Chapter 1: Materials and Technologies for Production in Opto- and Microelectronics

Morphological, Structural and Optical Characteristics of Porous GaN Fabricated by UV-Assisted Electrochemical Etching	
N.S. Mohd Razali, A.F. Abd Rahim, R. Radzali, A. Mahmood and M.F. Bahrol Anuar	3
Porosification Analysis on the Effect of Resistivity Dependence on N-Type Pulsed Porous Silicon	
N.H. Abd Wahab, A.F. Abd Rahim, A. Mahmood, N.A.M. Napiah, R. Radzali and Y. Yusof	12
The Effect of Needle Diameter on Optical Properties and Morphological Structure of La₂O₃- PVA Phosphor Nanofibers Prepared by Electrospinning Method	
H.A. Wahab, Z. Hassan and N.M. Ahmed	18
The Effect of Hydrogen Concentration on Chemical Vapour Deposition Synthesis of β-Ga₂O₃ Nanostructures	
P.R. Jubu, F.K. Yam and I. Ahemen	27
Morphological and Structural Properties of Sol-Gel Derived ZnO Thin Films Spin-Coated on Different Substrates	
N. Kasim, Z. Hassan, W.F. Lim, S.M. Mohammad and H.J. Quah	35
Spin Coated CuO with Different Additives (PEG) Value Thin Film: Physical, Structural, Optical and Electrical Characteristics of CuO/PEG	
R. Abdul Rahman, M.A. Zulkefle, N.S. Muhammad Kamar, Z. Mohamad, S.H. Herman and R.I. Alip	43
UV-Blue Light Conversion Using Dyes Polymeric Materials	
A.F. Ismael	52
Study of the Effect of Injection Currents on White Light Emission of Ce-Doped YAG Phosphor Powder Prepared by Microwave Combustion	
H.R. Abd, Z. Hassan, N.M. Ahmed, A.F. Omar, K.S. Lau and F.H. Alsultany	60
Synthesis and Characterization of YAG:Ce Phosphor by Microwave Induced Combustion Synthesis with Different Fuel Sources	
K.S. Lau, Z. Hassan, W.F. Lim, H.J. Quah, N.M. Ahmed and H.R. Abd	69
Chromaticity Properties of Curcuminoids Dye Nanofibers Prepared by Electrospinning for White Light Down-Conversion	
M. Al Shafouri, N.M. Ahmed, Z. Hassan and M.A. Almessiere	77

Chapter 2: Materials for Sensing Technologies and Planar Unipolar Devices

Agarose-Chitosan Based Hydrogel Waveguide Matrix: Comparison Synthesis and Performance for Optical Leaky Waveguide (OLW) Biosensor	
S.R. Makhsin, P. Gardner, N.J. Goddard and P.J. Scully	87
Effect of Li Substitution in MgO Nanostructured on Band Gap Energy via Combustion Synthesis Method	
N.F. Chayed, N. Badar, K. Elong and N. Kamarulzaman	97
Fabrication of SiNWs-FET Nanostructure Via Atomic Force Microscopy Lithography	
N.N. Alias, K.A. Yaacob and K.Y. Cheong	103
Improved Rectification Performance and Terahertz Detection in Hybrid Structure of Self-Switching Device (SSD) and Planar Barrier Diode (PBD) Using Two-Dimensional Device Simulation	
N.F. Zakaria, S.R. Kasjoo, M.M. Isa, Z. Zailan, M.K. Md Arshad and A. Song	111
Photometric Detection of Heavy Metals Using Biosynthesized Gold Nanoparticles	
A.I. Usman and A. Abdul Aziz	118

Chapter 3: Materials in Photovoltaics and Photocatalytic Technologies

Application of Conjugated Chlorophyll from Natural Dye (*Imperata cylindrica*) to Apply in Hybrid DSSC as Third Generation Solar Energy

N. Ishak, H. Salleh, S.A. Rahman, A.N. Dagang, N.H. Kamarulzaman, Z. Ahmad, S.N. Abd Majid and S.M. Ghazali

135

Boron Nitride Doped Polypyrrole Hybrid Composites for Photocatalytic Degradation of 2-Chlorophenol from Aqueous Solution

F. Yunus, M.S. Kassim, S. Shahabuddin, N.R. Said and S.N.A. Baharin

145

Effect of Ultrasonic Agitation and Spin Coating Speed on the Photovoltaic Properties of Inverted Organic Solar Cell Using Solution-Dispersed Copper Iodide as Anode Buffer Layer

F.L. Khairulaman and C.C. Yap

153

A Simplest, Cheapest and Most Efficient Technique to Enhance the Performance of Solid State Dye-Sensitized Solar Cell: Deposition of Purple Seaweed as a Photosensitizer

S.M. Ghazali, H. Salleh, A.N. Dagang, N.A. Nik Ali, N. Ishak, N.H. Kamaruzaman, M.S.M. Ghazali, M.N. Md Daud and N. Ali

160

Broadband Anti-Reflection in Black Silicon Fabricated by Two-Step Silver-Assisted Wet Chemical Etching for Photovoltaics

A. Abdulkadir, N.A. Md. Noor, A. Abdul Aziz and M.Z. Pakhuruddin

167

Photocatalytic Fuel Cell Based on Zinc Oxide Loaded Carbon Plate Photoanode for Simultaneous Photocatalytic Degradation of Azo Dyes and Electricity Generation

Y.P. Ong, L.N. Ho, S.A. Ong, B. Johar and A.H. Ibrahim

175

Ray Tracing of Light Trapping Schemes in Thin Crystalline Silicon for Photovoltaics

M.Z. Pakhuruddin

183

Chapter 4: Functional and Special Materials

Electrochemical Performance of Mn and Fe Substitution in LiCo_{0.9}X_{0.1}O₂ Cathode Materials

N.S.S. Mohd Abdillih, N. Kamarulzaman, K. Elong, N. Badar and M.S. Mastuli

195

Impact of Eu Nanoparticles Substitution for Ca Site in Bi(Pb)-2223 Cuprates Superconductor

E.S. Nurbaisyatul, H. Azhan, A. Kasim, I. Norazila and S.F. Saipuddin

202

Long Chain Imidazolium Ionic Liquids as Templates in the Formation of Mesoporous Silica Nanospheres

E.D.M. Isa, H. Ahmad and M.B.A. Rahman

209

Chapter 5: Polymeric and Composite Materials

Effect of Acetylation Contact Time to the Physical and Mechanical Properties of Jack Fruit Rind Cellulose Acetate (JR-CA) Reinforced Gelatine Film

W.A. Rahman, N.S. Anuar and N.A. Majid

219

Study on Effect of Fiber Orientation on Flexural Properties of Glass Fiber Reinforced Epoxy Composite Laminates for Structural Applications

H.F.A. Marzuki, E.A.E. Ubaidillah, S.A. Sivarasa, M. Syamsul and M. Mustapha

227