

Table of Contents

Chapter 1: Nanomaterials and Applied Nanotechnology

Synthesis and Characterization of Highly Crystalline Zinc Phosphide Nanoparticles	3
T.H. Lim, G.B. Teh and R.D. Tilley	
Effect of Ferrocene Catalyst and Hydrogen Feed on Microstructures of Vertically Aligned MWCNTs	8
S. Shukrullah, N.M. Mohamed, M.S. Shaharun and M. Yasar	
Thermal Conductivity Enhancement of Graphene Epoxy Nanocomposite	13
A. Izzati Ismadi, K.Z. Ku Ahmad, Norazrina, K.Y. Leong and R.N.I.R. Othman	
Surface Modification of Multi-Walled Carbon Nanotube Using Double-Chained Quaternary Ammonium Bromide	18
M.J. Osman, W.M.Z. Wan Yunus, O.K. Khim, N.A.M. Kasim, S.H. Jamal, M. Ahmad and N.A. Ibrahim	
Electrodeposited Iron(III) Oxide (α-Fe₂O₃) Thermoelectric Thin Films	23
M.Z. Shaiful Azni, H.K. Tan, P.L. Low, N.K. Devaraj, B.H. Ong and T.Y. Tou	
Synthesis of TiO₂ Nanotube Arrays in NaOH Added Ethylene Glycol Electrolyte and the Effect of Annealing Temperature on the Nanotube Arrays to their Photocurrent Performance	28
M.A.A. Taib, G. Kawamura, A. Matsuda, M. Mustapha, A.R. Khairunisak and Z. Lockman	
Electrophoretic Deposition of Functionalized Multi-Walled Carbon Nanotubes (f-MWCNTs)-Polyaniline (PANi)	33
S. Fahdil, S.H. Khalid, A. Mohamad Yusof, M. Mokhtar, A.N. Alias and I.S. Zaine	
Process Development and Optimization of Carbon-Based Thin Film Deposition through Ablation of Graphite	42
C.W.L. Andrew, V. Damideh, S.H. Saw and C.S. Lim	
Decoration of Plasma-Reduced Graphene Oxide with Uniform Gold Nanoparticles and their Redox Reaction Performance	47
K.A. Wahid, M.A.S.M. Haniff, M.I. Syono and I.A. Azid	
An Assessment of Chemical Vapor Deposition Synthesis of SnO₂ Nanowires by Statistical Design	52
M.A.M. Akhir, K. Mohamed, S.A. Rezan, H.L. Lee and S.S.M. Izah	
Modelling and Simulation of Rectangular Bundle of Single-Walled Carbon Nanotubes for Antenna Applications	57
Y.N. Jurn, F. Malek, S.A. Mahmood, W.W. Liu, M.A. Fakhri and M.H. Salih	
Effects of Ultrasound Irradiation on Synthesis of Solid Acid Catalysts	67
M. Ameen, M.T. Azizan, S. Yusup, A. Ramli, M. Yasir, K.A. Jais and M.H. Sa'aid	
Impact of LPCVD TEOS Thickness on Vt-Pushout in Flash Memory Cell due to Mechanical Stress	73
P.H. Teoh, G. Temple and C.C. Tin	
Characterization of Stoichiometric ZrO₂ Thin Film on Si by Angle-Resolved X-Ray Photoelectron Spectroscopy	77
Y.H. Wong and K.Y. Cheong	
Thermal Degradation and Char Morphology of HNTs Reinforced Epoxy Based Intumescent Fire Retardant Coatings	83
Q.F. Gillani, F. Ahmad, M.I. Abdul Mutalib and E. Syahera	
Surface Morphology Analysis and Mechanical Characterization of Electrospun Nanofibrous Structure	89
D. Wong, A. Andriyana, B.C. Ang, Y.R. Chan, J.J.L. Lee, A.M. Afifi and E. Verron	

Chapter 2: Properties of Materials and Development of Processing Technologies

Laser Recovery of Subsurface Damages in Chemomechanically Polished Silicon Wafers K. Niitsu, Y. Tayama, H. Maehara, T. Kato and J.W. Yan	97
Effect of Mixed Filler on Thermal Properties of Foodstuff Conveyor Belts Compound Using an Industrial Microwave Pre-Heating S. Limhengha, S. Limnararat and W. Sriseubsa	101
Effect of Surfactant on EDM of Low Conductivity Reaction-Bonded Silicon Carbide M.R. Abdul Razak, P.J. Liew, N.I.S. Hussein and Q. Ahsan	107
Optimization of Warm Compaction Process Parameters in Synthesizing Carbon-Copper Composite Using Taguchi Method S. Budin, M.A. Nurul Hadi, T.R. Jaafar and M.A. Selamat	112
Preparation of Oil Palm EFB Derived Solid Acid Catalyst for Esterification Reaction: Effect of Calcination Temperature S. Gowri Krishnan, F.L. Pua, K. Palanisamy and S. Nabihah	117
Oxidation Behavior of NiAl Produced by Gel Combustion Synthesis T.A. Gonsalvez, A. Manap, N. Afandi and H. Misran	122
Influence of Second Reflow on the Intermetallic Compound Growth with Different Surface Finish H. Kahar, Z.A. Abd Malek, S.R.A. Idris and M. Ishak	127
Microstructural Study of Leached Nitrided Malaysian Ilmenite with Coal-Polystyrene Reductant A. Yaraghi, M.H. Abang Sapri, E. Ahmadi, N. Baharun, S.A. Rezan, N.I. Shoparwe, S. Ramakrishnan, K.S. Ariffin, A.F. Mohd Noor, H. Zabidi, H. Ismail and H.H. Seli	132
Characterization of Raw and Thermally Treated Alum Sludge M.Y. Soleha, O.K. Khim, W.M.Z.W. Yunus, A. Mansor, F. Anwar, I.N. Azowa, S.A.S.M. Shafiq, N.A. Ahmad Shah, A. Aidy, K.Z. Ku Ahmad and C.C. Teoh	138
Prediction and Optimization of Process Parameters on Metal Inert Gas of Dissimilar Aluminium Alloy AA6061-T6 and AA7075-T6 Using Response Surface Method Analysis N.F. Mohd Noordin, M. Ishak and L.H. Ahmad Shah	143
Interfacial Reaction Analysis of Cu-Sn-Ni-P/Cu Joint Using Microwave Hybrid Heating M. Lutfi, F. Yusof, T. Ariga, R. Singh and M.H. Bin Abd Shukor	148
Effect of Taper Pin Ratio on AA7075 Aluminium Alloy Friction Stir Welding N.H. Othman, N. Abdul Razak, L.H. Ahmad Shah and M. Ishak	154
Influences of Stirring Speed and Post Annealing Temperature on the Properties of Zinc Oxide Colloid Prepared by Sol-Gel Spin Coating Method S.J. Teh, Y.K. Sin, K.Y. Chan and N.K. Devaraj	159
Investigation on the Effect of Crystal Orientation Dependence of Pulse Porous Silicon for White Light Emission N.H. Abd Wahab, A.F. Abd Rahim, F.I. Mohamad Latar and A. Mahmood	164
Study of Forging Process of Yttrium-Modified A356 Aluminum Alloy and Numerical Simulation by Thermo-Viscoplastic Finite Element Method H.K. Kam, C.C. Wang, Y.P. Lim and W.C. Cheong	177
Feasibility Study of Low Power Fiber Laser Welding AA2024 and AA7075 Alloys T-Joint S. Janasekaran, A.W. Tan, F. Yusof and M.H. Abdul Shukor	182
Effect of Rolling Reduction on Microstructure and Mechanical Properties of Plain Low Carbon Steel P. Nordala, R. Othman and A.B. Ismail	187
Optimisation of Assembly Line Balancing Type-E with Resource Constraints Using NSGA-II M. Jusop and M.F.F. Ab Rashid	195
Optimisation of End Milling Machining Parameters Using the Taguchi Method and ANOVA of AlSi/AlN Metal Matrix Composite Material M.S. Said, J.A. Ghani, M.A. Selamat, N.N. Wan and H.C.H. Che	200
Experimental Study of Engine Performance and Fuel Consumption Using Various Blends: Ethanol, Naphthalene and Palm Oil M.I.H. Ismail, R. Othman and L.K. Koay	205
Development of a Quantifiable Approach in Monitoring the Fatigue Cracks Using Digital Image Correlation S.W. Khoo, S. Karuppanan and C.S. Tan	211

Interfacial Reaction between Sn-Ag-Cu-Mg Solder and ENIG Substrate H. Nishikawa, A.N. Alhazaa, S.L. He, A.A. Almajid and M.S. Soliman	216
Evaluation of Thermoelectric Properties of Cu_{3.21}Bi_{4.79}S₉ Bismuth Chalcogenide M.C. Barma, B.D. Long, M.F. Mohd Sabri, R. Singh, S.M. Said, K. Kimura and S. Rahman	220
The Effect of Iron Oxide on the Mechanical and Ageing Properties of Y-TZP Ceramic S. Sivanesan, H.L. Teow, R. Singh, A. Niakan and N. Mase	225
Multiaxial Viscoplasticity Modelling of Power Plant Steel A.A. Saad, W. Sun and A.L. Mohd Tobi	230
Numerical Simulation of a Corner Crack Growth in Metals under Multiaxial Fatigue Loading Y.W. Siow, C.J. Tan, J. Purbolaksono and A. Andriyana	235

Chapter 3: Properties and Technological Use of Polymers and Composites

Effect of ENR50/STR5L Blends on Properties of Foodstuff Conveyor Belts Compound S. Limhengha, S. Limnararat and W. Sriseubsai	243
Effect of Ethylene Glycol on Polymeric Membrane Fabrication for Membrane Distillation K.C. Chong, C.E. Lim, S.O. Lai and W.J. Lau	250
The Progress of Polymeric Membrane Separation Technique in O₂/N₂ Separation K.C. Chong, S.O. Lai, H.S. Thiam and W.J. Lau	255
Fabrication and Characterization of Porcine Bone-Derived Hydroxyapatite-Alumina Biocomposite M. Apostol, J.L. Lobigan and J.K. Cruz	260
Fabrication and Characterization of Poly(Vinyl Alcohol)/Chitosan Blend Electrospun Nanofibrous Membrane M.S. Islam, F. Mansura, A.M. Afifi and B.C. Ang	265
Synthesis and Characterization of Covalent Organic Polymer S.P. Lee, N. Mellon, T.K. Lau, A. Mohd Shariff and J.M. Leveque	270
Mathematical Modeling of Thickness Dependent Physical Aging in Polymeric Membranes S.S.M. Lock, K.K. Lau, I.S.M. Lock, A.M. Shariff, Y.F. Yeong and B. Abdullah	275
The Synergistic Effect of Flame Retardants on Flammability, Thermal and Mechanical Properties of Natural Fiber Reinforced Epoxy Composite P. Khalili, K.Y. Tshai, I. Kong, J.H. Lee and F.A. Mostafa	281
The Effects of Graphene and Flame Retardants on Flammability and Mechanical Properties of Natural Fibre Reinforced Polymer Composites P. Khalili, K.Y. Tshai, I. Kong and C.H. Yeoh	286
Effect of Aluminum Source on the Structural and Thermal Properties of Partially Phosphorylated Polyvinyl Alcohol Composite (PPVA) - Aluminum Phosphate (PPVA-AlPO₄) Nanocomposite A.M. Saat and M.R. Johan	291
Effect of Chemical Treatment on Oil Palm Empty Fruit Bunch (OPEFB) Fiber on Water Absorption and Tensile Properties of OPEFB Fiber Reinforced Epoxy Composite C.S. Hassan, N.R. Chellaiah, B. Sahari, M.S. Salit and N. Abdul Aziz	295
Study on Interlaminar Shear Strength of Angle Ply Oriented Basalt-Carbon Hybrid Composite A.N. Mengal and S. Karuppanan	300
Synthesis and Characterization of Polyvinyl Alcohol/Zinc Hydroxide Composite U. Habiba, A.M. Afifi and B.C. Ang	307

Chapter 4: Materials and Technologies in Construction

Non-Isothermal Degradation Kinetics of Asphalt in Relation to its Chemical Composition K.P. Marquez and R.B. Lamorena-Lim	315
Shear Resistance Enhancement of Oil-Contaminated Railtrack Ballast with Rubber Circular Patch Formulation S.F.S.M. Johan and C.M. Chan	320