

Table of Contents

Preface, Committee

Chapter 1: Development of New Composite Materials

Composite Material Modeling under Drop Weight Impact Test Using Finite Element Analysis K. Tanadrob and C. Suvanjumrat	3
Structural and Electrical Properties of Graphite in Polyaniline/Graphite (PANI/G) Composites T.N. Atiqah, S.J. Tan, K.L. Foo, A.G. Supri and M.F. Abdullah	9
Effect of Thermal Expansion and Sonication on Mechanical Properties and Adhesive Toughness Measurement of Polymer/Graphene Composite N.I. Che Berhanuddin, S.A. Mohd Rozlan, I.B. Zaman, M.S. Mustapa, M.E. Abdullah and I.A. Bahrudin	14
Development Approach of Asbestos-Free Friction Material Using Flyash Particles D. Pupan, C. Suvanjumrat and W. Chookaew	19
Study on Properties of Spherical Non-Metallic Explosion Suppression Materials Y.J. Zhou, C.B. Lu, C.H. Xiong, Z.L. Yang, G.J. An and X.D. Wang	25
The Influence of Particles Size and Composition Variation of NiCr-CrC(20NiCr) Metal Matrix Composites Coatings Properties on Boiler Tubes Application E. Martides, B. Prawara, H. Ardy, E. Junianto and B. Priyono	30
Failure Analysis of Glass/Epoxy and Graphite/Epoxy Laminates due to the Effect of Variation in Lamination Scheme and Angle of Fibre Orientation N.N. Noh, A.H. Samsudin and J. Mahmud	36
Effect of ENR Contents on Cure Characteristic and Properties of NR/ENR/EVA Foam C. Thongpin, A. Muanwong, J. Yanyongsak and P. Lorphaitoon	45
Optimum Injection Moulding Processing Condition to Reduce Shrinkage and Warpage for Polypropylene-Nanoclay-Bamboo Fibre with Compatibilizer M.H. Othman, S. Hasan, M.H.I. Ibrahim and S.Z. Khamis	51
Mechanical Characterization of Graphite and CNT Reinforced Aluminium-5083 D.S.R. Smart, N.P. Johns and J.J. Smart	56

Chapter 2: Materials for Biomedical Application

Analysis on Mechanical Property for Varied Geometry and Structure Parameters of Silicon Based Filtration Membrane for Artificial Kidney K.A. Mustafa, A.A. Hamzah, Y. Jumril and B.Y. Majlis	65
Surface Modification of Bacterial Cellulose Film F.C. Yee and S.I. Abd Razak	71
Effects of Halloysite Nanotubes on the Mechanical Properties of Polysaccharide Films I.F. Wahab, S.I. Abd Razak and F.C. Yee	75
Development of Porous Ti-6Al-4V Dental Implant by Metal Injection Molding with Palm Stearin Binder System N.A. Abu Kasim, N.H.M. Nor, M.H. Ismail and J. Saedon	79
Investigation of Temperature and Stress Distribution on High Speed Machining of Ti6Al4V and 316L Steel Biomaterials Using Explicit Dynamic Analysis P. Ponnusamy and M. Joshi	84
Phase Contamination Characterization of Stepwise-Built Functionally Graded Hydroxyapatite/Titanium (HA/Ti) Sintered under Various Atmospheres S.N.S. Jamaludin, S. Basri, F. Mustapha, D.M. Nuruzzaman, M.I.A. Latiff and N.M. Ismail	90

Chapter 3: Properties and Processing Technologies of Metals and Alloys

Testing the Performance of a Traditional Furnace Melting Process on Bronze as the Material of Gamelan I.G.N. Priambadi and I.K.G. Sugita	99
Research Extent Equilibrium of the Melt Steel before Crystallization V.S. Tsepelev, V. Mushnikov and N. Tsepeleva	104
The Unit for Determining the Density and Surface Tension of Metallic Liquid Alloys, Using the Sessile Drop Method V.S. Tsepelev, V.V. Vyukhin and A. Povodator	108
Observation of Material Flow in Friction Stir Forming for A5083 Aluminum Alloy Gear-Rack T. Ohashi, H.M. Tabatabaei and T. Nishihara	113
Evaluation of Friction Properties of Magnesium Alloy during Hot Forging by Ring Compression Test S. Hirawatari, H. Watari, S. Nishida, Y. Sato and M. Suzuki	119
Influence of Process Conditions on Spangle Size of 55%Al-Zn Alloy Coated Steel Sheet T.X. Guo, Q. Xu, C.R. Ran and X.Q. Dong	127
The Study of Dendrite Arm Spacing (DAS) on Acoustical of Tin Bronze 20Sn Alloy as Gamelan Bali Materials I.K.G. Sugita and I.G.N. Priambadi	133
Effect of Secondary Phase Precipitation on Impact Toughness of Duplex Stainless Steel A. Powar, A. Gujar, N. Manthani, V. Pawar and R. Singh	138
Investigation on Mode I Propagation Behavior of Fatigue Crack in Precipitation-Hardened Aluminum Alloy with Different Mg Content S.F. Anis, M. Koyama and H. Noguchi	143
Solidification Analysis in Permanent Mould Casting of Aluminium Alloy LM6 Reinforced Titanium Carbide Particulates Metal Matrix Composites N. Fatchurrohman and S. Sulaiman	148
Investigation of Chip and Surface Roughness when Milling AISI304 Stainless Steel K. Kadirgama and K.A. Abou-El-Hossein	152
Cyclic Oxidation Performance of Si-Aluminide/MCrAlY Coating on Ni-Base GTD-111 Superalloy K. Shirvani and S.V. Miraboutalebi	159
Shape Memory Effect in New Ti-Nb-Ta Alloy A.M. Keshtta and M.A. Gepreel	165

Chapter 4: Materials and Technologies for Fuel Cells, Solar Cells and for Energy Storage

Synthesis of $\text{La}_{10}\text{Si}_{6-2x}\text{Bi}_{2x}\text{O}_{27-x}$ as Possible Electrolyte Materials for Solid Oxide Fuel Cells H.Q.H.H. Absah, A.H. Karim, M.S. Abu Bakar, L.C. Ming and A.K. Azad	173
Donor-Modified Anthocyanin Dye-Sensitized Solar Cell with TiO_2 Nanoparticles: Density Functional Theory Investigation E.C. Prima, B. Yulianto, Suyatman and H.K. Dipojono	178
Potential of Palm Oil Mill Effluent (POME) as Growth Medium for Sulfate-Reducing Bacterium in Microbial Fuel Cell Z. Abdul Halim, N.R. Abu Sepian and K. Abd Karim	184
Characterization of Planar Interdigital Micro Supercapacitor with PECVD Graphene as Electrodes at Low Temperature H.E.Z. Abidin, A.A. Hamzah, M.A. Mohamed and B.Y. Majlis	191
Synthesis, Structural and Thermal Properties of Layered Perovskites $\text{SmBaMn}_2\text{O}_{5+d}$ for SOFCs Applications A.M. Abdalla, S. Hossain, J. Zhou, P.M.I. Petra and A.K. Azad	195
The Influence of Temperature on Conductivity and Dielectric Properties of PMA/PVAc Blend with Addition of TPAI Salt A. Azmar, N.A.Y. Razamin and T. Winie	201

Chapter 5: Preparation and Characterization of Carbon Based Materials

Production and Characterisation of Single and Mixed Activated Carbons from Coconut Shell and Rubber Seed Pericarp Using Microwave-Induced Chemical Activating Agent N.S. Abdul Shukor, K. Ismail, R.R.R. Deris, A.B. Alis and M.A. Mohd Ishak	209
Preparation and Characterization of Single and Mixed Activated Carbons Derived from Coconut Shell and Palm Kernel Shell through Chemical Activation Using Microwave Irradiation System S.A. Mohd Amran, K. Ismail, A.B. Alis, S.S.A. Syed-Hassan and A.H. Jawad	215
Preparation and Application of Zinc Chloride-Modified Cocoa (<i>Theobroma cacao</i>) Pod Husk-Based Carbon for the Removal of Acid Dyes N.A. Zainal, S. Ibrahim and B. Arifin	221

Chapter 6: Nanomaterials and Nanotechnologies

Characterization of Nanostructured Titania and Titanate Materials Synthesized by Simple Hydrothermal Method N.A. Ismail, R. Mohd Hasmizam, K. Anuar and M. Amin	229
Study on Band Gap Energy of F Doped TiO₂ Nanotubes R. Mohd Hasmizam, N.A. Ismail and M. Yusoff	234
Study of Nano-Kaolinite Properties in Clay Liner Application A.N. binti Zainuddin, M. binti Mukri, N.N.S. binti Nik Ab Aziz and M.K.T. bin Mohamed Yusof	239
Dynamic Characteristics of Circular and Square Graphene Diaphragm for Capacitive Microphone H. Mohd Mustapha, M.A. Mohamed, A.A. Hamzah and B.Y. Majlis	243
Chirality Dependence of Gas Adsorption Property of Single Wall Carbon Nanotubes G.R. Ahmed Jamal, M.R. Islam, M.A. Rahman, J.F. Meem and R.A. Sathie	248
An Improved Technique for Chirality Assignment of SWCNTs Exploiting their (2n+m) Family Behavior G.R. Ahmed Jamal, M.A. Siddique, Sawon, K. Hasan and M.J. Alam	253

Chapter 7: Properties and Application of Building Materials

Strength and Water Absorption Rate of Concrete Made from Palm Oil Fuel Ash N. Manap, N.I. Muhamad and K. Sandirasegaran	261
Strength and Properties of Concrete Pavement Incorporating Multiple Blended Binders M.R. Hainin, P.J. Ramadhansyah, T.H. Chan, A.H. Norhidayah, F.M. Nazri and Ichwana	265
Structural Behaviour of Beam with HDPE Plastic Balls Subjected to Flexural Load N. Mohamad, W.I. Goh, A.A.A. Samad, A. Lockman and A. Alalwani	270
Flow Insulation Characteristics of Combined Two Cordierite Alumina Porous Plates with Free Space P. Khantikamol and M. Polsongkram	275