

Table of Contents

Preface, Committees and Sponsors

Chapter 1: Novel Composite Materials and their Characterization

High Volume Fraction Aluminum /Alumina-Fused Silica Hybrid Particulate Metal Matrix Composite

G. Roudini, M. Asgharian and M. Khosravi 3

Tensile Properties of Impregnated Sugar Palm (*Arenga pinnata*) Fibre Composite Filled Thermosetting Polymer Composites

A.H. Ibrahim, L. Zulkiflle and S.M. Sapuan 8

Development of Concrete Mix Design Nomograph Containing Polyethylene Terephthalate (PET) as Fine Aggregate

M.I. Juki, K. Muhamad, M.M.K. Annas, K.H. Boon, N. Othman, A. binti Abdul Kadir, R.M. Asyraf and F.S. Khalid 12

PP/PS/PMMA Ternary Blend Foaming Using Supercritical CO₂

R.W. Sharudin, H. Alwi and M. Ohshima 17

Effect of Different Vacuum Pressure on the Tensile Properties of Sugar Palm Frond Fibre Reinforced Polyester Composites

S.A. Syed Azuan, M.M. Saufi, M.G. Azniah and J.M. Juraidi 23

Carbon Doped Iron Ore Using Palm Kernel Shell

R.Z.A. Rashid, H. Purwanto, H.M. Salleh, M.H. Ani, N.A. Yunus and T. Akiyama 28

Flexural Strength Behavior of Composite UHPFC - Existing Concrete

B.A. Tayeh, B.H.A. Bakar, M.A. Megat Johari and A.M. Zeyad 32

Mechanical Properties of Rubber Toughened Polyester Filled Carbon Black

A.A. Redzuan, N.N. Bonnia, S. Siti Shakirah, M.R.H. Mohamed and S.N. Surip 37

Comparison of Melt Flow and Mechanical Properties of Rice Husk and Kenaf Hybrid Composites

A.A. Noor Zuhaira and R. Mohamed 42

Dielectric Properties of the Composite Insulator Mica Epoxy-Novolac

D.E. Gavrilă and H.C. Gavrilă 47

Sound Absorption Coefficients Natural Fibre Reinforced Composites

E. Jayamani and S. Hamdan 53

Environmental Stress Cracking Resistance (ESCR) of Rubber-Toughened Polyester-Kenaf Composites under Active Environment

N.S. Shuhaimen, N.N. Bonnia, M.R. Aein Afina and M.R.H. Mohamed 59

Thermal Characterizations and Mechanical Properties of Hybrid Blends of Pva/Starch/LLDPE

M.F. Bin Ab Aziz and M. Rahmah 64

Chapter 2: Advances in Materials Technology

Evaluation on Diffusion of Bipolar Junction Transistor (BJT) Charge-Carrier and its Dependency on Total Dose Irradiation

H.F. Abdul Amir and F.P. Chee 71

Fatigue Life for Type 316L Stainless Steel under Cyclic Loading

K.A. Mohammad, E.S. Zainudin, S.M. Sapuan, N.I. Zahari and A. Aidy 77

Effect of Tubes Length and Annealing Temperature on Energy Absorption of Aluminium Alloy Tube 6061-T6 under Inversion Collapse Mode

M.S. Meon, M.F. Othman, M.H. Mahamad Basri, H. Husain and J.B. Saedon 82

Review of Self-Healing Effect on Shape Memory Alloy (SMA) Structures

M.R. Hassan, M. Mehrpouya, S. Emamian and M.N. Sheikholeslam 87

Effect of Chitosan Compounds on Composite Fibers Properties

N. Suwannamek and K. Srikulkit 93

Cryogel Based Oil Encapsulation for Controlled Release of Curcumin by Using a Ternary System of Chitosan, Kappa-Carrageenan, and Carboxymethylcellulose Sodium Salt	98
N. Sowasod, K. Nakagawa, W. Tanthapanichakoon and T. Charinpanitkul	
Synthesis of VTES/SBA-15 Prepared by Post-Grafting: XRD Characteristics on the Effect of Calcination Properties	103
N. Rahmat and K.N. Ismail	
Effect of New Thermal Insulation to the Growth of LiNbO₃ Single Crystal by Czochralski Method	108
W.H.A. Kamaruddin, H.H. Kusuma and Z. Ibrahim	

Chapter 3: Developments in Magnetic Materials, Electrical Composites, Thin Films and ZnO Technology

Conduction Mechanism and Dielectric Properties of Solid Biopolymer Electrolyte Incorporated with Silver Nitrate	
M.F. Shukur, R. Ithnin, F. Sonsudin, R. Yahya, Z. Ahmad and M.F.Z. Kadir	115
Electrical Properties of Starch Based Silver Ion Conducting Solid Biopolymer Electrolyte	120
M.F. Shukur, F. Sonsudin, R. Yahya, Z. Ahmad, R. Ithnin and M.F.Z. Kadir	
Electronic Structure of Defects in SnTe	125
S. Ahmad	
Synthesis and Characterization of Strontium-Doped Lanthanum Cobaltite Cathode Material Prepared by a Modified Combined Complexing Method	
A.A. Samat, M.A. Mohd Ishak, H.A. Hamid and O. Nafisah	131
Effect of Dielectric Waveguide in the Design of RLSA Antenna: A Review	
O.S. Ifeoma, T.A. Rahman, R. Ngah and I.S. Zakwoi	136
Magnetization of Low Grade Iron Ore Using Empty Fruit Bunch Ash	
A.Y. Nurul, M.H. Ani, P. Hadi, M.S. Hamzah, Z.A.R. Rusila and A. Tomohiro	141
Tunable Silver Leaching from Polyelectrolyte Multilayers Thin Films	
S. Wacharanad and S.T. Dubas	145
Effect of Al₂O₃ on the Electrical Conductivity and Structural Study in MgI₂-Mg₃(PO₄)₂ Based Solid Electrolyte	
A. Aziz, M.M. Mahat and A.H. Ahmad	150
Exchange Coupled Composite Media for Magnetic Recording – Issues and Challenges	
H. Gavrilă and D. Gavrilă	154
Synthesis and Characterization of Zinc Oxide Hollow and Flower like Microspheres by Simple One Step Solvothermal Approach	
S. Jamil, X.Y. Jing, J. Wang and M.L. Zhang	163
Synthesis of ZnO Thin Film on Porous Silicon by Spin Coating in Various Low Molarities Precursor	
K.A. Eswar, A.A. Azlinda, M.H. Fadzilah Suhaimi, M. Rusop and S. Abdullah	167
Synthesis and Characterization of ZnO Thin Film Memristor	
M.M. Yusoff, M.H. Ani and Suryanto	172

Chapter 4: More Studies on Nano Materials, Nano Composites and Nano Technology

Hydrogen Storage Investigation of Fixed Bed of Nanocrystalline Mg-Ni-Cr Mixed Oxides	179
M.A. Salam, S. Sufian and T. Murugesan	
Morphological and Structural Study on Titania Nanotubes Formation by Difference Voltage	
Z. Usaili, N.A. Jani and S. Abdullah	184
A Comparative Study of Confined Carrier Concentration of Laser Using Quantum well and Quantum Dot in Active Layer	
M.A. Humayun, M.A. Rashid, F. Malek, A. Yusof, F.S. Abdullah and N.B. Ahmad	188
Characteristics of Dammar Based Paint System with the Addition of Silver Nanoclay	
A.N. Hasnan, A.H. Ahmad and M.M. Zain	192

Electrical Conductivity and Hardness Property of CNTs/Epoxy Nanocomposites H. Suherman, J. Sahari and A.B. Sulong	197
Cable and Wire Application: Adoption of Nanomagnesium Hydroxide Blended with LDPE/EVA for Mechanical and Physical Properties A.A. Abdul Aziz, S.M. Alauddin, R.M. Salleh and M.I. Shueb	202
Thermal Stability Study of Ce_{0.75}-Zr_{0.25}O Nanostructures Synthesized via Water-in-Oil Microemulsion Method N.A.M. Jani, A. Hadi and K.N. Ismail	207
The Effect of Synthesis Method on the Physico-Chemical Properties of Magnetite Iron Oxide Nanoparticles H. Mohd Zobir, S. Nor Suzariana and S. Abdul Halim	212
A Thermal Controlled Release of Naproxen from Sodium Phosphorylated Chitosan Nanoemulsion S. Chongprakobkit and W. Tachaboonyakiat	217

Chapter 5: Developments in Biocomposites, Bioethanol and Green Materials

Flexural and Impact Properties of Biopolymer Derived from Sugar Palm Tree J. Sahari, S.M. Sapuan, E.S. Zainudin and M.A. Maleque	225
Preparation of Biodegradable Film from Esterified Corn Husk Cellulose U. Ratanakamnuan, W. Manorom and P. Inthasai	229
Enhancement the Dissolution Rate and Solubility of Poorly Soluble Drugs: Review M.A. Saleh, S.A. Mohammed, E.C. Abdullah and L.A. Hashim	234
Effect of Alkali Treatment on the Tensile Behavior and Structure of Betel Nut (<i>Areca catechu</i>) Husk Fiber L. Yusriah, S.M. Sapuan, E.S. Zainudin and J.M. Mariatti	239
Biomaterials Availability: Potential for Bioethanol Production I.S. Azmi, A. Azizan, R. Mohd Salleh, R. Jalil, T.E.T. Zainal Mulok, N. Idris, S. Ubong and A.L. Sihab	243
Energy Efficient Microwave Irradiation of Sago Bark Waste (SBW) for Bioethanol Production T.S. Kannan, A.S. Ahmed and A. Farid Nasir	249
The Effect of Processing Parameters Onpoly (Lactic Acid)/Poly(Ethylene Oxide)Bicomponentultrafine Fibersby Co-Electrospinning S. Pavasupree, K. Srikulkit and R. Rangkupan	254

Chapter 6: Lightweight Foamed Concrete, Foamed Greencrete, Cement Syntactic Foam

Impact Energy for First Crack of Reinforced Concrete with Partial Replacements of Sand by Rubber 1 mm Particle Size B.H. Abu Bakar, M.M. Al-Tayeb, H. Ismail and H. M. Akil	261
Use of Plastic Waste (High Density Polyethylene) in Concrete Mixture as Aggregate Replacement N.L. Rahim, S. Sallehuddin, N.M. Ibrahim, R. Che Amat and M.F. Ab Jalil	265
Morphology of Formulated Used Cooking Oil Foam (FUSCOF) Created for Lightweight Greencrete M.M.A. Hafiz, A.R.M. Ridzuan, A.M. Faiza, M.F. Arshad and J. Nurliza	270
Morphology and Physical Analysis of Waste Paper Sludge Ash (WPSA) Polymeric Mortar A.R.M. Ridzuan, A.A. Khairulniza, M.A. Fadzil and J. Nurliza	275
Development of Precast Lightweight Foamed Concrete Sandwich Panel (PLFP) with Double Shear Truss Connector: An Overview W.I. Goh, N. Mohamad and R. Abdullah	280
Impact Energy for the First Crack of Reinforced Concrete with Partial Replacements of Sand by Fine Crumb Rubber M.M. Al-Tayeb, B.H. Abu Bakar, H. Ismail and H.M. Akil	286

The Influence Wall Thickness of Cement Hollow Spheres towards Compressive Properties of Cement Syntactic Foam

N. Hasan, S.F.S. Hashim and Z.M. Ariff

291

Effect of Fineness of Fly Ash on Powder Packing Density and Paste Performance

W. Yang, N.Q. Feng, C.G. Bee and X. Deng

296

Chapter 7: Chemical Engineering, Corrosion, Geochemistry and Geotextile

Application of Plasma Treated Activated Carbon to Enhancement of Phenol Removal by Ozonation in Three-Phase Fluidized Bed Reactor

P. Limsuwan, S. Kumagai, M. Nonaka, K. Sasaki, W. Tanthapanichakoon and T. Hirajima

305

Effect of Humic Acid on Geochemistry Properties of Kaolin

F.B. Pakir, A.T.B. Abdul Karim, F.N.L. Ling and K.A. Kassim

310

Comparative Electrochemical Performance Characteristics of Aluminium-Air Cell Employing Seawater and NaCl Electrolytes

M. Akmal, R. Othman and M.H. Ani

314

The Effect of Amorphous Rice Husk Silica to the Polysulfone Membrane Separation Process

Z. Harun, M.R. Jamalludin, M.Z. Yunos, M.F. Shohur and A.F. Ismail

319

Natural Corrosion Inhibitor for Corrosion Protection of Metal Artefact: An Overview

M. Musa, M.H. Ani and R. Othman

323

Rheological Properties of Urea-CaLS Mixture for Urea Fertilizer Granulation

J.M. Juoi, F.I. Nazari, N.M.M. Mitan and A. Shaaban

329

Performance of Nonwoven Geotextile as a Filter at Road Shoulder

S. binti Salehuddin, N.L. Rahim, N.M. Ibrahim and M.A. Hafiz Bin Ilias

333

Mathematical Modelling of Urea-Formaldehyde Polymerization Kinetics Using Mechanism Approach

P. Ruamcharoen and J. Ruamcharoen

337

Simplified Colorimetric Method Using Reactive Orange 16 for Analysis of Cationic Surfactant

S.W. Puasa, M.S. Ruzitah and A.S.A.K. Sharifah

342

Chapter 8: Advances in Manufacturing Techniques

Influence of Machining Parameters on Surface Roughness in WEDM Titanium Alloy

J.B. Saedon, P.J.R. Ding J.R., M.S.M. Shawal, H. Husain and M.S. Meon

349

Investigation of Chip-Tool Interface Temperature during Turning of Hardened AISI 4340 Alloy Steel Using Multi-Layer Coated Carbide Inserts

S. Chinchanikar, S.K. Choudhury and A.P. Kulkarni

354

Real Coded Genetic Algorithms for Solving Flexible Job-Shop Scheduling Problem - Part I: Modelling

W.F. Mahmudy, R.M. Marian and L.H.S. Luong

359

Real Coded Genetic Algorithms for Solving Flexible Job-Shop Scheduling Problem - Part II: Optimization

W.F. Mahmudy, R.M. Marian and L.H.S. Luong

364

Ti6Al4V Surface Hardness Improvement by Duplex Coating

Y. Yusuf, Z.M. Rosli, J.M. Juoi, Z. Mahamud and K.W. Loon

370

Overview Potential Applications of Cold Spray Process for Aviation Industry in Malaysia

O. Nooririnah, A.Y. Khalil, M.S. Aludin, A. Rohana and R.R. Zuraidah

375

Development of a New Approach for Incorporating Tool Tilting in Friction Stir Welding

B. Ghazanfar, M. Awang, S.R. Khan and H. Fawad

378

A. Hariri, A.M. Leman and M.Z.M. Yusof

382

Chapter 9: Wastewater Treatment and Biotechnology

Elemental Analysis and Wettability Properties of Polyene with Epoxidised Oil Based Coating	389
M.N. Norizan and R. Mohamed	
Screening Microbial Surface Active Compound Produced by Bacteria Isolated from Various Waste Streams	394
C. Marajan, K. Ramasamy and S. Abdul Talib	
Ionic Liquids: Green Solvent for Pretreatment of Lingocellulosic Biomass	399
A.A. Nagoor Gunny and D. Arbain	
A Metaheuristic Approach to Transmembrane Protein Assembly Using Limited Distance Restraints	403
K. Sujaree and P. Sompornpisut	
Characterization of Rambutan Seed (<i>Nephelium lappaceum</i>) as Natural Adsorbent for Wastewater Treatment	408
N.M. Ibrahim, S.F.Z. Mohd Sarif, R. Che Amat, S. Salehuddin and N.L. Rahim	

Chapter 10: Analysis of Composite Structures and Other Miscellaneous Researches

Storage Conditions and Particle Size Effects on Powder Cohesion Index Using Stable Micro System	415
S.A. Mohammed, E.C. Abdullah and A.A.A. Raman	
Effect of Polycaprolactone Electrospun Fiber Size on L929 Cell Behavior	420
N. Kulpreechanan, T. Bunaprasert, S. Damrongsakkul, S. Kanokpanont and R. Rangkupan	
Finite Element Analysis of Composite Cylinder with Centre Cutout under Axial Load and Internal Pressure	425
M.S. Ismail, B.T.H.T. Baharudin, S.A. Yahya and H.A. Kahar	
Comprehensive Review on the Utilization of PALF	430
S.A. Binti Yahya and Y. Yusof	
Analysis of Surface Electromyography for On-Off Control	435
B.S. Chan, C.L. Sia, F. Wong, R. Chin, J.A. Dargham and Y.S. Siang	
Study and Comparison of Vibration-Based Intrusive and Non-Intrusive Sand Monitoring System	440
G. Liu, P.T. Liu and B.S. He	