

Table of Contents

Preface

Chapter 1: Special and Functional Materials

| | |
|---|----|
| Oxygen Reduction Reaction in Layer-by-Layer Fabricated Cobalt Porphyrin-Based Nanostructures | |
| B. Lamlua, T. Ohyama and Y. Nagao | 3 |
| Thermophysical Properties for ZnO-Water Nanofluid: Experimental Study | |
| A.H. Rasheed, H. Alias and S.D. Salman | 9 |
| Study on Electrical Conduction Properties of Plasticized CMC-DTAB Based Solid Biopolymer Electrolytes | |
| N.F. Mazuki, P.K. Singh and A.S. Samsudin | 15 |
| Electrochemical Characterization of Graphite-Zero-Valent Iron for 3-Monochloropropane-1,2-Diol (3-MCPD) Detection | |
| F.A. Arris, W.N. Manan, H. Kaco, A.H. Shaffie and M.S. Sajab | 20 |
| Effect of Intermolecular Interaction on Ionic Conductivity of CMC-DTAB Plasticized with Ec Based Solid Biopolymer Electrolyte | |
| N.M. Khan, N.S. Mohd Ali and A.S. Samsudin | 26 |
| Effect of Organic Linkers on Metal-Organic Frameworks Electrode Fabrication for Battery Supercapacitor Hybrid Application | |
| A.L. Sanusi, N.K.M. Zain, I.I. Misnon and R. Jose | 32 |
| Analysis of Absorbance Patterns and Functional Groups of BIO-Dye (<i>Ocimum sanctum</i>) Based on pH Variations in the Wet and Dry Extraction Method | |
| E. Supriyanto, A. Dikayanti, N. Andriani, H.A. Kartikasari, R. Qohhar and A.G.E. Sutjipto | 38 |

Chapter 2: Polymers and Composites

| | |
|--|----|
| 3D Printed Polyurethane Reinforced Graphene Nanoplatelets | |
| D. Mohan, M.S. Sajab, S.B. Bakarudin, R. Roslan and H. Kaco | 47 |
| Mechanical Properties of Aramid Composite as an Alternative in Use of Steel on the Manufacture of CN-235 Aircraft Wings | |
| F.N. Hidayah, I. Farikha and D.E. Maspaitella | 53 |
| Fabrication and Characterization of Cold-Pressed and Sintered Aluminium - MWCNT Composites | |
| V.G. Dhore, W.S. Rathod and K.N. Patil | 60 |
| The Effects of Different Chemical Treatment Methods and Maleic Anhydride Grafted Polyethylene on the Mechanical and Thermal Properties of <i>Alpinia galanga</i> Fiber Reinforced Polyethylene Composites | |
| R. Binti Mustapha, M. Awang and S.N.H. Binti Mustapha | 69 |
| Performance of Hybrid Reinforced Metal Matrix Composite Brake Disc: Simulation Approach | |
| W.K. Gan and N. Fatchurrohman | 77 |
| Potential of Seaweed (<i>Kappaphycus alvarezii</i>) as a Particleboard | |
| N. Salim, Y. Abdullah and R. Hashim | 82 |

Chapter 3: Bioprocessing and Green Chemistry

| | |
|---|----|
| Fourier-Transform Infra Red (FTIR) Analysis of UV Curing Biobased-Polyurethane from Epoxidized Palm Oil Using Acrylation and Thiols Addition | |
| N.A. Binti Ahmad, S.N.H. Binti Mustapha, S. Bin Zakaria, R. Roslan, T.C. Lee and R. Binti Mustapha | 91 |
| Effects of Cytokinin in Enhancing the Multiplication of Vegetative <i>Hylocereus polyrhizus</i> | |
| Z.C. Ng, S.H.R. Shiekh Mahmud and S.H. Tan | 97 |

| | |
|---|-----|
| Azolla Biomass as Liquid Biofertilizer to Improve Yield and Productivity of Paddy Plant Using Efficient Monitoring System | 104 |
| N.H.I. Bakar, N.S. Adzahar, T.C. Lee, R. Yusvana and R.A. Raus | |
| Study on Soil Properties towards Formation of High Quality Agarwood Resin in <i>Aquilaria crassna</i> | 110 |
| M.S.M. Hamdan, M.A.H. Ismail, S.H.N. Shaarani and S.N. bin Tajuddin | |
| Variability in Fat Properties, Polyphenols and Antinutrient Contents during Fermentation and Roasted Seed of Pulasan (<i>Nephelium mutabile</i>) | 116 |
| H. Abd Hamid, I.H. Yahya and C.P. See | |
| Analysis of Volatile Compound from Commercial Swiftlet Aroma Using Solid-Phase Microextraction Gas Chromatography-Mass Spectrometry (SPME-GC-MS) | 122 |
| N.F.N.b.M. Nordin, C.M.A. bin Che Mohd and S.N. bin Tajuddin | |
| Determination of Proximate Composition of Malaysian Horseshoe Crab (<i>Tachypleus gigas</i>) | 128 |
| N. Iszhan, F.N.M. Subakir and N. Zaharudin | |
| Application of Different Fruit Peels Powder as an Organic Fertilisers for the Effective Growth of Water Spinach (<i>Ipomoea aquatica</i>) | 134 |
| N. Iszhan, F.N.M. Subakir, H.K. Mun, T.H. Thing and N. Zaharudin | |
| Performance and Kinetic Evaluation of Palm Oil Mill Effluent (POME) Digestion in a Continuous High Rate Up-Flow Anaerobic Sludge Blanket (UASB) Bioreactor | 141 |
| M.M. Ibrahim, Z. Jemaat and A. Hamid Nour | |
| Optimization of Red Pigment Production by Solid State Fermentation Using Oil Palm Frond | 150 |
| N.F.S. Daud, F. Mohd Said, N.H.M. Yasin and M.A.K.M. Zahari | |
| Extraction and Characterization of Keratin from Chicken and Swiftlet Feather | 157 |
| S.Z.S. Badrulzaman, A.W. Aminan, A.N.M. Ramli, R. Che Man and N.I. Wan Azelee | |
| Antioxidant and Antimicrobial Screening of Isolated Alkaloids from <i>Tinospora crispa</i> | 163 |
| H. Abd Hamid, R. Mutazah, I.H. Yahya and S.S. Zeyohannes | |
| Microbiota of a UASB Reactor Treating Palm Oil Mill Effluent Using HiSeq Sequencing | 169 |
| M.M. Ibrahim, Z. Jemaat and A. Hamid Nour | |
| Obtaining Bio-Hydrogen from Palm Oil Mill Effluent (POME) - A Preliminary Evaluation | 177 |
| M.M. Ibrahim, Z. Jemaat and A. Hamid Nour | |

Chapter 4: Materials and Technologies for Pharmacology and Biomedicine

| | |
|--|-----|
| Biomineralization of Hydroxyethyl Cellulose/Sodium Alginate for Bone Tissue | 185 |
| E. Bakhiet, N.F.I.M. Jauhari and F.H. Zulkifli | |
| In Vitro Anti-Cancer Activities of <i>Luvunga scandens</i> ('Mengkurat Jakun') on Oral Squamous Cell Carcinoma Cells | 191 |
| S.J.A. Ichwan, M.A. bin Yacob, M.A.M. Ramlee, W. Lestari and M. Taher | |
| The Measurement of Saliva and Tongue Coating pH in Patients with Physiological Halitosis before and after Using Selected Mouthwashes | 197 |
| W. Lestari, F. bin Helmy, M.A.I. bin Zawawi, A.A. bin Enche Othman, A. Kusumawardani and Y.D. Ardini | |
| Systemic Delivery of Calcium Channel Blockers for Hypertension through Transdermal Delivery - A Review | 204 |
| K.A.S. AL-Japairai and S. Mahmood | |
| Precursor Profiling of Extracted Pseudoephedrine Using Gas Chromatography-Mass Spectrometry (GCMS) in Conjunction with Chemometric Procedure | 209 |
| A.H.A. Nadzri, D. Ismail, S.K. Jayaram, N.Z.M. Muslim and W.N.S.M. Desa | |
| In Silico Functional and Structural Insight of Prenylated Pyrazolocurcumin Derivative Associated with the PGE₂ Inhibition through mPGES-1 Blocking | 219 |
| M.F.F. Mohd Aluwi, F. Salim, A.K.M.M. Huq, K. Rullah and L.K. Wai | |
| In Vitro Wound Healing Effect of Asiaticoside Extracted from <i>Centella asiatica</i> ('Pegaga') on Human Gingival Fibroblast Cell Line | 224 |
| W.H. Suriyah, A.J. Rizal, H.S.M. Nadzirin, S.J.A. Ichwan and M.L.M. Isa | |
| Parkinson's Disease - A Review on Advances and Treatment Strategies | 230 |
| S. Raman, S. Mahmood, A.R. Hilles and A. Rahman | |

Enhancement of Cisplatin Cytotoxicity in Combination with Thymoquinone on Oral Cancer HSC-4 Cell Line

W.H. Suriyah, S.J.A. Ichwan and M.L.M. Isa 236

Chemical Constituents Profiles and Antibacterial Activity of *Psidium guajava* Leaves Essential Oil

N.N. Hussin, N.S. Adzahar, T.C. Lee and J.R. Venugopal 242

GC-MS Analysis and *In Vitro* Antioxidant Activity of Crude Extracts and Different Fractions of *Moringa Oleifera* Pods

H. Hadi, N.S.A. Roslan and N. Zamri 247

Starch Based Film Incorporated with *Clitoria ternatea* Flower Extracts as pH Indicator

H. Abd Hamid, R. Mutazah, I.H. Yahya and S.S. Zeyohannes 252

Chapter 5: Materials and Technologies in Environmental Engineering

The Evolution of Gasses in Fire Suppression Systems to Promote Changes in Industrial Towards Global Sustainability

J.b.A. Shukor, R. Jamian, A. Hassan and M.A.H.A. Razak 259

An Attempt to Develop Aerobic Granular Sludge in Continuous Airlift Reactors

M.S. Mohd Shafei and Z. Jemaat 265

Role of the Selected Grass Species in Developing of Swampy Forest System for Passive Treatment of Acid Mine Drainage

I. Noor, Y.F. Arifin, B.J. Priatmadi and A.R. Saidy 273

Determination of Selected Heavy Metal Concentrations in Water Spinach (*Ipomea aquatica*)

W.N.A. Ab Manan and N. Zulkurnain 279

The Effectiveness of Ni/Ce/Al₂O₃ Catalyst in the Extraction of Naphthenic Acids from Acidic Crude Oil

N.H. Aziz, N.A.M. Shohaimi and N.S. Che Harun 284

Chapter 6: Membranes and Membrane Technologies

Influence of Molecular Weight on the Morphology and Structure of Electrospun Polyvinylidene Fluoride (PVDF)

A.S. Zahari, M.H. Mazwir and I.I. Misnon 293

Effect of Solvents Ratio and Polymer Concentration on Electrospun Polybenzimidazole Nanofiber Membranes Fabrication

N. Nordin, I.I. Misnon, K.F. Chong, K.S. Loh and R. Jose 299

Chapter 7: Wood Processing and Papermaking Technologies

Comparison of Phenol-Formaldehyde and Lignin-Formaldehyde Resin Adhesives for Wood Application

M.N.A. Yaakob, R. Roslan, N. Salim and S. Zakaria 307

Fiber Morphology of Different Bamboo Species and Age

N.M. Suhaimi, N.H. Mohd Hassan, R. Ibrahim and L. Jasmani 312

Alkaline Treatment on the Chemical and Morphological Properties of Kelempayan (*Neolamarckia cadamba*) Wood

W.M.N.W.A. Rahman, N.Y.M. Yunus, N.S.M. Tamat and S.N. Sarmin 319

A Review of Shear Properties for Malaysian Tropical Timber in Structural Size

M.B.F. Mohd Puaad, Z. Ahmad, N.F.A. Aziz, A.R. Abu Talip and M.H. Yasin 325

Chapter 8: Technologies of Chemical Engineering

Total Acid Number Reduction of Acidic Petroleum Crude Oil by Using 2-Methylimidazole in Polyethylene Glycol and Ca/Al₂O₃ Catalyst

N.S. Che Harun, N.A.M. Shohaimi and S. Daud 337

Preparation of CaO-SiO₂ Adsorbent for Potential CO₂ Capture via Dry Mixing Method

F.D.M. Daud, N.A. Kosen, M.S. Mahmud, N. Sariffudin and H.H.M. Zaki 343