Table of Contents

Preface

Chapter 1: Polymers and Composites

Effects of Nanoclay on the Tensile Strength and Microstructure of Tigernut Fibre- Epoxy Composites (NFPCs)	
A.O. Adeodu, I.A. Daniyan, F.D. Adewumi, G. Orgwara and M. Adewale	3
Highly Conductive Polymer Composite Based on Graphite-Filled Immiscible Polyolefin/Epoxy Blends O.A. Alo and I.O. Otunniyi	10
Development of Biodegradable Plastic Sheet from Blends of Low Density Polyethylene	
(LDPE) and Banana Peel Starch S.A. Afolalu, O.M. Ikumapayi, A.T. Ogundipe, O.R. Oloyede and O.O. Yusuf	22
Mechanical Properties of Polyester Resin Reinforced with Treated Plantain Pseudo Steam	
Fibers P.E. Imoisili and T.C. Jen	32
Chapter 2: Structural Metals	
The Status of High Entropy Alloys Studies in Africa: An Overview O. Akinbami, L.M. Mohlala, D. Klenam, J. van der Merwe and M. Bodunrin	41
A Physical Simulation of Heat Affected Zone of Creep Resistant Steel: Microstructure and Mechanical Properties Analysis J. Obiko, C. Lesley, D. Whitefield and M. Bodunrin	54
Failure Mode and Cost Effect Analysis of a Model Bone Crushing Hammer B.M. Edun, O.O. Ajayi and P.O. Babalola	63
Chapter 3: Corrosion Protection of Structural Materials	
Synergistic Protection of Mild Steel in Sodium Chloride Solutions Using Mixtures of Sustainable Corrosion Inhibitors	
J. Akpoborie, O.S.I. Fayomi, K.M. Oluwasegun, O. Sanni, J. Ren, W.B. Wan Nik and D.O. Daramola	73
Development of <i>Micropogonias undulatus</i> Scales Nanoparticulate - Reinforced <i>In Situ</i> Anti- Corrosion Composite Coatings	
O.P. Abioye, O.S.I. Fayomi and R.T. Loto	83
Cocos nucifera Surfactant Performance on Stainless Steel in Hcl and H ₂ SO ₄ Solutions M.A. Fajobi, R.T. Loto, I.G. Akande and A. Araoyinbo	93
Insight on the Realizing of Agro-Based Sustainable Low-Cost Fiber Particulate Composite for Thin Film Application in Biofouling Environment O.P. Abioye, O.S.I. Fayomi and A.A. Abioye	101
Adsorption Effect of <i>Arachis hypogaea</i> and <i>Cocos nucifera</i> Surfactant Inhibitors on 316L Steel in HCL Acid Solution M.A. Fajobi, R.T. Loto, I.G. Akande, A.K. Aworinde and A. Araoyinbo	108
Stress Corrosion Cracking and the Effects of <i>Citrus x aurantiifolia</i> on Mild Steel - A Green	100
Approach O.S.I. Fayomi, J. Akpoborie, O. Sanni, J. Ren, W.B. Wan Nik, J.A. Oyebanji, K.M. Oluwasegun, J.O. Ojediran and F. Zulkifli	116

Chapter 4: Functional Materials and Special Technologies

Influence of Pre-Annealing on Densification, Microstructure, and Microhardness of Spark Plasma Sintered TiO ₂ -MnO ₂ Composites L.M. Mohlala, P.A. Olubambi, N.P. Cele and T.C. Jen	137
Dye-Sensitized Solar Cells (DSSCS) Based on a Natural Dye (Mangifera indica): A Mini	
Review M.R. Mogoboya, P.E. Imoisili and T.C. Jen	146
Microwave-Assisted Synthesis and Characterization of Zeolite Prepared From South Africa Coal Fly Ash P.E. Imoisili and T.C. Jen	154
Application of Self - Cleaning Filters in the Removal of Turbidity from River Water: Pilot	
Study A.K. Lebea, D. Ramutshatsha-Makhwedzha and L.M. Moropeng - Mavhungu	160
Effect of Ni Doping and Vacancy Defects on the Sensing Characteristics of Graphene for NO ₂ and CO Detection: A DFT Study L.M. Mohlala, T.C. Jen and P.A. Olubambi	170
Chapter 5: Technical Fluids	
Effect of Copper-Nanofluids Cooling Media on Flow and Thermal Characteristics of a Cross-Flow Heat Exchanger O.O. Olamide, O. Balogun, L. Olaitan, S. Kuye and M.A. Waheed	185
Comparative Analysis of Palm Oil and Hydrocarbon Mineral Oil for Power Transformer	103
Operation L.C. Ekechukwu and T. Madueme	199
Thermophysical Properties and Heat Transfer Characteristics of Nanorefrigerants: Some Existing Results and Areas for Further Researches M. Ogbonnaya, O.O. Ajayi, M.A. Waheed and E.Y. Salawu	207
The Influence of Nanoparticle Additive on the Thermophysical Properties of Bionanolubricant Using Castor Oil	
M. Ogbonnaya, O. Francis, O.O. Ajayi, A. Daniel and A.T. Samuel	228
Chapter 6: Technologies in Fuel Production	
Optimization of the Removal of Naphthenic Acids from Crude Oil via Catalytic Esterification	
Z.Z. Onyeke, O.P. Bolade and F.V. Adams	241
Assessment of the Yield Response from Parsley Biodiesel Production Using Calcium Oxide as a Potential Catalyst	• • •
S.O. Bitire and T.C. Jen The Potential of Payeley Pictures of Alternative Euglin Discel Engines	250
The Potential of Parsley Biodiesel as an Alternative Fuel in Diesel Engines S.O. Bitire and T.C. Jen	258
Chapter 7: Building Materials	
Impact of Sodium Silicate Activator on Compressive Strength of Cement-RHA Based Stabilized Lateritic Soil. A Case Study of Kwali, Abuja FCT, Nigeria O.O. Amu, C.E. Igibah and A.O. Adedapo	269
Utilizations of Contemporary Autonomous Material Applications as Sustainable Mechanism of Build and Construction M. Abbood and G. Al Slik	278
Utilization of Waste Materials for Eco-Friendly Building Ceilings: An Overview J. Dirisu, O. Joseph, P.O. Babalola, S.O. Oyedepo, O.S.I. Fayomi, K.M. Oluwasegun, U. Nduka, O.O. Ajayi and M. Ajibero	285