

Table of Contents

Preface

Chapter 1: Structural Alloys

Investigation into Stress Relaxation and Creep Rate of C47200 Copper Alloy S. Akande, T. Ikomi, T.M. Azeez and O.M. Ikumapayi	3
Mechanical and Microstructural Behavior of Sintered NiAl-Based High Entropy Alloy E. Olorundaisi, B.J. Babalola, M.L. Teffo and P.A. Olubambi	14
The Influence of Cow's Bone Calcium Concentration on the Mechanical Characteristics of a Mg-Al Alloy T.M. Azeez, S. Akande, S.A. Afolalu, A. Adetunla and B. Adaramola	26
Phase Prediction, Microstructure, and Microhardness of Sintered Nickel-Based Superalloy B.J. Babalola, R. Nengwekhulu, O.O. Ayodele, B.C. Mashabela and P.A. Olubambi	32
Process Optimization of Spark Plasma Sintered Parameters for Ti-Al-Cr-Nb-Ni-Cu-Co High Entropy Alloy by Response Surface Methodology U.S. Anamu, E. Olorundaisi, O.O. Ayodele, B.J. Babalola, P.I. Odetola, A. Ogunmefun, K. Ukoba, T.C. Jen and P.A. Olubambi	40

Chapter 2: Metal Corrosion Behaviour and Corrosion Protection

Corrosion Evaluation and Inhibiting Effect of Chlorpheniramine Drug on Mild Steel in HCl Acid O.A. Odunlami, O. Ogunleye, O.S.I. Fayomi and M. Fajobi	53
Silicon Nanoparticles Derived from Waste Rice Husk as Potential Siliconizing Material for Mild Steel V.S. Aigbodion, P.A. Ozor and N.I. Sukdeo	69
Effects of Surfactants on the Corrosion Behavior of Aluminum Alloy in Graphene Nanofluid A. Borode, N.A. Ahmed and P.A. Olubambi	76
Emerging Behaviour of Alloy Steel Microstructure in Hydrogen Sulphide Environment - A Review S.L. Lawal, S.A. Afolalu, T.C. Jen and E.T. Akinlabi	90
Corrosion Control and its Application in Marine Environment - A Review S.L. Lawal, S.A. Afolalu, T.C. Jen and E.T. Akinlabi	102

Chapter 3: Composite Materials

Stress Intensity Factor of E-Glass Fiber Reinforced Polyester Composites M. Osaretin, S.O. Edelugo, P.U. Akpan, C.O.A. Agbo, P.A. Ozor and N.I. Sukdeo	117
Post-Buckling Analysis of E-Glass Fiber Reinforced Thin-Walled Cylindrical Composite B.N. Ugwu, J.N. Ani, T. Suoware and S.O. Edelugo	128
Weibull Technique for Evaluation of Swelling: Composite Graphite Resin Electrode for Electrochemical Treatment of Gold Mining Wastewaters K.O. Olayanju, K.A. Bolorunduro and I.A. Oke	137
Mechanism and Kinetics of Water Absorption of Plantain Fibre Reinforced Bio-Composites P.E. Imoisili and T.C. Jen	147
Effect of Mercerization on the Crystallographic, Macromolecular, and Thermal Properties of Plantain Fibers for Fiber Reinforced Composite P.E. Imoisili and T.C. Jen	155
Mechanical Properties Response of Heat Treated Recycled Aluminium Alloy Reinforced with Gold Nanoparticle (AuNps) Extracted from Aloe Vera Leaf T.M. Azeez, S. Akande, O.M. Ikumapayi, J. Kayode and S.A. Afolalu	163

Novel Enhancement Opportunities in the Thermal and Electrical Conductivity of α-Al-CNTs+AgNPs Nanocomposites P.A. Ozor, V.S. Aigbodion and N.E. Nwobodo-Anyadiiegwu	173
---	-----

Chapter 4: Green Building Materials

Waste Glass in Road Construction: A Review A.K. Ogundana and S.A. Afolalu	183
Emerging Trends in Sustainable Materials for Green Building Constructions O.S. Orenuga, O. Adebisi and I. Adediran	192

Chapter 5: Biofuel Production

Prediction of Cumulative Biomethane Yield Using Artificial Neural Network - Case Study of an Industrial Biogas Plant R.O. Dada and O.T. Laseinde	205
Tranesterification and Comparative Analysis of Bio Diesel Production Using Blighia Sapida (Ackee Seed) as Substrate L. Rominiyi, B. Adaramola, J.F. Eiche, O.T. Oginni, D.V. Ewere and T.O. Oni	215
Utilization of Macadamia nut oil as a feedstock for a Sustainable Biodiesel Production M.L. Mojapelo, P.E. Imoisili, T.C. Jen and M.E. Makhatha	224
Development of South Africa Macadamia Nuts and its Utilization for Biodiesel Production M.L. Mojapelo, P.E. Imoisili, T.C. Jen and M.E. Makhatha	234

Chapter 6: Environmental Impact Assessment and Renewable Energy Development

Environmental Impacts of Cement Production on the Total Nitrogen and Nitrate Distribution of Soil and Dust in Selected Areas around Ewekoro, Ogun State O. Opanike, K. Ross, H. Whiley, O.A. Omotosho, E.O. Akindele and O.O. Yusuf	245
Modeling the Influence of Intake Air N₂ Content on Internal Combustion Exhaust Gases Output J.D.C. Hossi, D. Nkazi, J. van der Merwe and K. Harding	253
Renewable Energy Technologies: Opportunities and Challenges for South Africa P.E. Imoisili and T.C. Jen	262
Hepatocellular Effect of Copper Poisoning on the Liver and Kidney of Albino Rats (<i>Rattus norvicus</i>) O. Opanike, O.A. Omotosho, E.O. Akindele and O.O. Yusuf	270

Chapter 7: Design of Technical Systems

Design and Fabrication of a Bone Crushing Machine/Hammer Mill for Sustainable Livestock Feed Production B.M. Edun, O.O. Ajayi and P.O. Babalola	281
Design and Performance Evaluation of a Cassava Harvester Lifting Unit B.M. Edun, L.A.S. Agbetoye, O.O. Ajayi and E.Y. Salawu	297
Artificial Neural Network Modelling of Electrical Conductivity in GNP-Al₂O₃ Hybrid Nanofluids A. Borode, T. Tshephe and P.A. Olubambi	309

Chapter 8: Industrial Engineering

Application of Digital Lean Manufacturing System in Additive Manufacturing Industries: A Review M. Alabi	319
--	-----

Review of Green Manufacturing: A Sustainable Tool to a Cleaner Environment A.A. Noiki, B.M. Edun, E.Y. Salawu and S.A. Afolalu	335
Future of Artificial Intelligence in Developing a Sustainable Intelligent Engineering Systems: A Review O.T. Emuowhochere, E.Y. Salawu, S.O. Ongbali and O.O. Ajayi	351