

Table of Contents

Preface

Chapter 1: Properties and Processing of Structural Metals and Alloys

Mechanical Crystallization of Amorphous Ti₅₀Al₃₀Ni₂₀ Alloy Prepared by Mechanical Alloying

P. Urban, F.T. Fernández, R.M.A. Louvier, R.A. Lopez and F.G. Cuevas 3

Nickel Porous Compacts Obtained by Electrical Discharge Consolidation

F.T. Fernández, P. Urban, R.A. Lopez, R.M.A. Louvier and J.M.M. Martos 9

Effect of Electron Beam Welding on the Microstructure and Mechanical Properties of Low-Cost Titanium Alloys

S.V. Akhonin, V.Y. Belous and R.V. Selin 15

Effect of Tool Geometry and Turning Parameters on Cutting Force during Ultra-Precision Diamond Machining of Rapidly Solidified Aluminum (RSA) Alloy 6061

P.B. Odedeyi and K. Abou-El-Hossein 21

Chapter 2: Coatings and Corrosion Protection

Localized Corrosion Susceptibility of 434 Ferritic Stainless Steel in Acid Chloride Media

R.T. Loto 29

Inhibition Performance of Arachis Hypogaea Extracts on 316L Steel in HCl Solution

M. Fajobi and R.T. Loto 35

Adsorption and Inhibition Performance of *Arachis hypogaea* Extracts on 316L Steel in H₂SO₄ Solution

M. Fajobi and R.T. Loto 41

Investigation of Interfacial Microstructures of TiN/AlN Multilayers by Neutron Reflectometry

R.D. Liu, Y.T. Liu, T.F. Li, L. Zhang, Z.J. Wang, K. Sun and D.F. Chen 47

Corrosion Resilience of 2101 LDX Duplex Stainless Steels in Varying Sulphate Anion Concentrations

R.T. Loto 55

Green Technology for Synthesis of Biomass Using *Phoenix dactylifera* for Protection of Aluminum - Mechanistic and Thermodynamic Studies

R. Natarajan, F.S.Z.S. Al Shibli, K.S.A. Al Reasi, S.M.T.T. Rahman and R. Manivasagan 61

Chapter 3: Polymers and Composites

Effect of Graphene Nanoplatelets on Mechanical Performance of GFRP Composites

S. Shabberhussain and R. Velmurugan 73

A Brief Overview on the Extraction of Cellulose from Medicinal Plants for Advanced Applications

D.G.A. Selikane, T.P. Gumede, K. Shingange and T.D. Malevu 81

Mechanical, Thermal and Shape Memory Characterization of a Novel Epoxy Shape Memory Polymer

M. Unnam, R. Velmurugan and S. Kumar 87

Hybrid Reinforced Aluminium Composites Using Reduced Graphene Oxide Fabricated via Powder Metallurgy Technique

B.G. Nassem, M.A. Daha and M.G. Nassem 97

Characterization and Antibacterial Potential of Melt Compounded Acrylonitrile Butadiene Styrene/Copper Nanoparticle Composites

P.A.N. de Yro, G.H. Cariño, C.J.D.C. Sargent and G.M.O. Quiachon 103

Synthesis, Characterization and Electron Beam Curing of Poly(Glycerol Sebacate Methacrylate)	
C. Aranilla, B.J.D. Barba, J.F. Madrid, M.T. Margarito, P.A.N. de Yro and B.A. Basilia	111
Tailoring the Properties of Polyurethane Coatings with Epoxidized Bio-Polyol Spin-Coated onto Glass and P-Type Si(100) Substrates	
J. Patricio, M.L. Budlayan, S. Arco, A.C. Alguno and A.A. Lubguban	117
Network Relaxation and Cooperativity in Ion Conducting Polymers PEO-Li: An Analysis Based on the BSCNF Model	
M. Aniya and M. Ikeda	129

Chapter 4: Functional Ceramics

Development of Characteristics and Thermal Properties of Ash Celadon Glazes in Thailand	
N. Dechboon	137

Chapter 5: Biomass Production and Its Application in Environmental Engineering

The Effect of Chemical Activation Method in the Preparation of Activated Carbon from Local Phoenix Dactylifera Waste Stems	
A.S.R. Al Gharibi, F.S. Mjalli, B.A. Tarboush and M.A.H. Al Saadi	145
Removal of Oil from Contaminated Wastewater Using Thermo-Chemically Modified Lignocellulosic Biomass	
M. Al Ajmi, A. AL- Hamadani, A.M. Yeneneh and T. Jafary	157
Nonlinear and Linear Analysis of Langmuir Adsorption Isotherm for Removal of Copper from its Aqueous Solution Using Cucumber Peel	
V. Gajendiran, A. Cuento and S. Selvaraju	171
Application of Novel Natural Biomass as Plant Growth Media in Renewable Energy Based Controlled Environment Growing System	
A.S. Al Hinai, F.S.Z.S. Al Shibli, R. Natarajan and G. Al Kindi	179
Enzyme Induced Calcite Precipitation (EICP) for Engineering Application by Using Plant Based Biomaterials	
U. Al Shibli, M.S. Alsaidi, A. Akhtar, M.U. Qureshi, Y. Zhao and N. Khalid	189
Adsorptive Removal of Multi-Metal Ions in Wastewater Using Electrospun Cellulose Acetate / Iron-Modified Nanozeolite Nanofibrous Membrane	
M.S. Tolentino, B.A. Basilia and R.R. Aquino	203

Chapter 6: Construction Materials

Exploration of Rock Strength Estimation and Stability Analysis of Highway Rocky Slopes	
J.Z. Zhang, Z.B. Cao and H.Q. Zhang	211
Variation of the Temperature and Environmental Humidity in Solid Concrete Slabs for Mezzanine Buildings Using the Species <i>Aptenia cordifolia</i> and <i>Sphagneticola trilobata</i>	
J. Rodríguez and K. Vilela	219