

Table of Contents

Preface

Chapter 1: Functional Materials

Development of a Method for Silica-Coating of Ruby Particles M. Ito, N. Yamauchi, K. Nakashima and Y. Kobayashi	3
Calcium Alginate-Glycerol Gel as an Organic Matrix to Induce the Mineralisation and Growth of Calcium Carbonate as a New Eco-Friendly Binder Composite O.d.S.H. Santos, W. Tian, K.M. Tse and Y.L. Li	11
Revolutionizing Antibacterial Material Production across Diverse Applications through Enhanced Fused Deposition Modeling Innovation W. Ahmed, A.H. Al-Marzouqi, E. Zanelidin, T.A. Rizvi and M. Khan	23
Enhancing the Thermal Conductivity of 1-OD/Indium Composite Phase Change Material for Thermal Energy Storage K. Pashayi and K.J. Kolonko	30
Vitrimer Materials: A Review of Self-Healing Properties R. Hayder, S. Kedziora and V. Panneer Selvam	40

Chapter 2: Sensors

Inkjet-Printed Liquid Gated Graphene Field Effect Transistor for the Detection of Interleukin-6 A.V.A. Jabines and E.P. Enriquez	53
ZnO/GO Composite as Electrochemical Sensor for GABA Detection O. Jongprateep, S. Pitiphattharabun, K. Lanamkham, G. Panomsuwan and J. Ohta	61

Chapter 3: Polymers and Composites

Effect of Loading Speed on Tensile Property of Single Flax Yarn/Shellac Green Composite Material H. Katogi	71
HLEBI (Homogeneous Low Potential Electron Beam Irradiation) Induced Tensile Elongation of 3D Printed Short Carbon Fiber Reinforced Polyamide (3D-SCFRPA66) M. Eichl, H.T. Uchida, T. Okazaki, K. Sagawa, F. Satoh, H. Irie, M.C. Faudree, M. Salvia, H. Kimura and Y. Nishi	77
Fabrication and Characterization of Acetic Acid-Treated Salago Fiber-Epoxy Composite: Enhancing Mechanical and Thermal Properties V.N.C. Perlado, C.J.T. Gante, J.A.M.C. Cosico, C.S. Emolaga and J.C. Millare	84
Nito “Core” Fiber-Reinforced Epoxy Composites: Enhancing Properties with NaHCO₃ Treatment A.M.B. Piamonte, C.S. Emolaga and J.C. Millare	91
A Comparative Assessment of Hole Integrity with Twist Drill Geometry in Drilling AFRP/AL7075-T6 Stack Material C.T. Xiang, M.H. Hassan and J. Abdullah	97
Microstructure Analysis of the Alloy 625-nTiC Metal-Matrix-Composites Produced by Suction Casting Ł. Rakoczy and R. Cygan	103

Chapter 4: Waste Treatment

Circular Materials from the Ocean Waste: Prototyping Additive Manufacturing Processes for 3D Printing with Regenerated Plastics L. Lopes, H. Daruari, F.M. Duarte, M. Almeida and P. Mendonca	111
---	-----

Evaluation of the Quality Properties of Paper Derived from Bacterial Cellulose from Banana Peels and Pineapple Peels: A Multivariate Statistical Analysis	
J.V. Cobos, J.F. Guevara Viejó, E.J. Carrasquero Rodríguez, J. Coello Viejó and F. Pacheco Olea	120
Development of Eco-Friendly Biomaterials: Recycled Thermoplastics Reinforced with Short Natural Cane and Palm Fibers	
C.A. Paltan, J.I. Fajardo, E.J. Carrasquero Rodríguez and K.A. Alvarez	126
Evaluation of Thermal Insulation and Air Permeability of Needle-Punched Nonwovens Recycled from Waste Pantyhose	
H. Sezgin, I. Yalçın Eniş and H. Maral	134
Magnetic Pecan Nutshell Biochar for Arsenic and Fluoride Removal: Effects of Particle Size and Pyrolysis Temperature	
S. Khamkure, L. Díaz-Jiménez, A. Reyes-Rosas, P. Gamero-Melo, A. Zermeño-González and E. Cortez-Quevedo	140
Transforming Textile Wastes: Innovative Design of Sustainable Composite Materials for Thermal Insulation in Buildings	
S. Ozdemir, J. Oztemur, H. Sezgin and I. Yalçın Eniş	146

Chapter 5: Building Materials

Development and Characteristics of Infra-Lightweight Foamed Concrete	
H. Al-Kroom and M.A. Elrahman	155
Adobe Block Design with Addition of Fiberglass to Improve the Compression Resistance in the District of Saylla, Province and Department of Cusco	
A.C.G. Hinostroza Berrios, A.A. Sosa Cusi huaman and E.A.A. Carlos	161
Application of Laterite-Based Geopolymer Mortar for Masonry Bedding	
Z.K. Nuru, E.P. Kearsley and W.A.H. Elsaigh	168
The Effect of Nanosilica on the Fresh Properties of Sustainable Self-Compacting Concrete	
S. Papatzani, G. Hloupis, P. Giatra and G. Aslanis	174
Fabrication of Metakaolin/Ignimbrite Geopolymer from the Añashuayco Quarry in Arequipa	
A.Í.S. Morais, D.K.O. Palmeira, J.A. Osajima, R.R.P. Garcia and F.A. Huamán-Mamani	180
Influence of the Incorporation of Recycled Glass Powder on the Fresh State Properties and Compressive, Tensile, and Flexural Strength at 7, 14, and 28 Days of a Sustainable Concrete with $f'_c = 280 \text{ kg/cm}^2$, Designed Using the ACI Method, in the City of Lima	
D.H.T. Brad, R.A.M. Henry and E.A.A. Carlos	187
Substitution of River Sand with Fly Ash in Self-Compacting Concrete by Utilizing Novel Admixture	
P.R. Khare, K.P. Vinay and S.P. Wanjari	196
Effect of Incorporating Oat Husk Ash on the Compressive Strength of Concrete with Recycled Aggregates	
C.S. Miguel Angel and M. Serrano	202

Chapter 6: Seismic Design of Buildings

Evaluation of the Seismic Performance of a High-Rise Building in Lima, Peru, Using the FEMA 440 and SEOAC Methodologies	
A.N. Lucana, R.M. Delgadillo and J.R. Casas	211

Chapter 7: Research and Design of Mechanisms and Equipment Parts

Optimization of the Four-Link Transmission Mechanism of the Knee Joint of a Quadruped Robot Based on the Strut Structure	
L.D. Mu, T.Q. Qiu, Z.J. Liang, W. Xu, Z.R. Wang and P. Xu	219
Industrial Asset Recovery Procedure Based on the Circular Economy - Case Study: Sliding Bearing Shoe of Tubular Ball Mill	
J.I. Fajardo, E.J. Carrasquero Rodríguez, C.A. Andrade and C.A. Paltan	227