

Table of Contents

Preface

Chapter 1: Polymers and Composites

Investigation of Eggshell Powder as Inorganic Filler of Bio-Blended between Polylactic Acid (PLA) and Polybutylene Succinate (PBS) A. Wiriya-Amornchai, K. Jittreetat, M. Champirom and S. Hortha	3
Comparison of the Influence of Carbon Obtained from Kitchen Waste and Synthetic Carbon on the Tensile Properties of Polyolefins A. Pilipović, J. Kováčik, N. Beronská, A. Opálková Šišková, T. Dvůrák and M. Rujnić Havstad	10
Preliminary Investigation on Mechanical Properties of Hollow Glass Spheres R. Sankaran and P.L. Show	16
Machine Learning-Based Research for Material Property Analysis and Prediction of UHPC/CNT Composites D. Kim and S.G. Hong	22
Environmental Impact of Chitosan Production from Black Soldier Flies Using Life Cycle Assessment A. Riofrio and H. Baykara	28

Chapter 2: Functional Materials

Highly Transparent Piezoelectric PVDF Electrospun Membranes R. Nair, A. Jain and N. Shehata	39
A Negative Thermal Expansion Metamaterial Inspired by the Sicilian and Manx Symbols T.C. Lim	48
Compositional Grading of Al₂O₃/ZrO₂/SUS304 Hybrid Materials Using Centrifugal Slurry Methods and Spark Plasma Sintering Y. Imai, S. Shirakawa, S. Shibui and H. Tsukamoto	54
Optical Characteristics of Copper-Doped-Perovskite Materials M. Gamal, I. Kandas, A. Hajjiah and N. Shehata	60
Lead-Bromide Hybrid Perovskites with Different Dimensions due to NH₂ Position Variation Pyridine Ligand Methylene Bridge-CH₂ A. Ramli, W.I.N. Wan Ismail, S. Sepeai, N.F.N.A. Yami and A.M.M. Ali	67
Green Synthesis of Citric Acid-Crosslinked Cellulose Acetate Membrane for Polymer Electrolyte C.R. Ratri, N.K. Pambudi, A.H. Arundati, A.F. Nugraha, M. Chalid and S. Astutiningsih	77

Chapter 3: Synthesis and Properties of Special Nanomaterials

Synthesis of Single Nanometer-Sized Au Nanoparticles Coated with Silica Toward X-Ray Contrast Agent T. Sakamoto, N. Yamauchi, T. Takase, M. Kimura, K. Gonda and Y. Kobayashi	85
Biosynthesis and Characterizations of Gold Nanoparticles (AuNPs) Prepare Using Different Age Classes of <i>Marphysa moribidii</i> (Polychaetes) Extract as Biogenic Reducing Agents N.A. Mocktar, M.N. Mustafa, N.A. Harun, W.I.W. Ismail, M. Maulidiani and I. Idris	95
Physicochemical Properties of Silk Fibroin Electrospun Membranes Functionalized with Gold Nanoparticles and Choline Based Bio-Ionic Liquids W. Agudelo, Y. Montoya, A. Garcia-Garcia and J. Bustamante	102
The Influence of Silica Dioxide in the Electrocatalytic Performances of rGO/Fe₃O₄ as Oxygen Reduction Electrocatalyst F. Yusoff and K. Suresh	108
Carbon-Based and Silicon-Based Nanomaterials for Enhanced Structural Adhesives M. Al-Zu'bi, L. Anguilano and M. Fan	115

Chapter 4: Materials Treatment, Welding, Forming and Additive Technologies

Parametric Study on Manufacturing of Continuous Glass Fibers Reinforced Polylactic Acid (PLA) Filaments for 3D Printing N. Muchhala, S. Desai, V.B. Suryawanshi and R. Tayade	127
Model-Based Heat Input Control Validated on Martensitic Steel 1.4313 I. Dey, S. Egorov, F. Soffel and K. Wegener	135
A Study on the Temperature Optimization of Mold and Melt Using Design of Experiments for Children's Chair P.Q. Trung	143
Selective Metallization on 3D Substrates for MIMO Antennae M.N. Lu, M.C. Chou, T.H. Kao, M.C. Huang, F.R. Hsiao and I.W. Tseng	149
A Study of Annealing Effects on the Joints of a Rotary Friction Welds of AISI 1030 Steel P.Q. Trung, B.D. Khanh and D.D. Qui	155
Studying the Effects of Annealing on the Mechanical Properties and Microstructure of Ultrasonic Vibration Welds P.Q. Trung, B.D. Khanh and D.D. Qui	161

Chapter 5: Applied and Structural Mechanics

Adaptational Response of Individual Trabeculae Morphology to Loading at Different Directions E. Smotrova, S.M. Li and V. Silberschmidt	169
Static and Fatigue Mechanical Properties of Polymer Matrix Composite Rods K. Naito	175
Application of a Custom Fe Simulation Technique for the Analysis of Hybrid Double-Cover Butt Joints V.G. Belardi and F. Vivio	186
Damage Localization in Plate Structures Based on Baseline-Free Method of Lamb Wave Using Mobile Transducer Set H.H. Huang and C.K. Chiang	192
Continuum Mechanics Models for Describing the Creep and Physical Aging Behaviors of Laminated Composites J.Y. Yang and F.L. Shang	197