

# Table of Contents

## Preface, Conference Committees

## Chapter 1: Properties and Processing Technologies of Metals and Alloys

<b>Spheroidize Annealing and Mechanical Property Evaluation of AISI 1040 Steel</b> S.R. Harisha, S. Sharma and U.A. Kini	3
<b>Microstructures and Tensile Characteristics on Direct Recycled Aluminium Chips AA6061/Al Powder by Hot Pressing Method</b> S. Kuddus, M.S. Mustapa, M.R. Ibrahim, S. Shamsudin, M.I. Ab Kadir and M.A. Lajis	9
<b>Abrasive Wear on Heat-Treated Recycling Aluminium AA6061 of Various Reinforcement Materials through Powder Metallurgical Process</b> A.S. Mahdi, M.S. Mustapa, M.R.M. Yunus, M.R. Ibrahim, M.I. Ab Kadir and M.W.A. Rashid	15
<b>Flexural Performance of the Heat-Treated Boron Alloyed Steel</b> R. Hafsham, M.S. Salwani, H. Mas-Ayu and R. Daud	21
<b>Process Optimization on Hardness of Precipitation Hardened Al6061 Alloy Using Design of Experiments</b> G. Shankar, U.A. Kini and S. Sharma	27
<b>Microstructure and Properties of Ni-Based Alloy Coating with Ultrasonic Frequency Inductive Cladding on Substrate of Cast Irons</b> J. Yu and B. Song	33
<b>Microstructure and Mechanical Properties of Equiatomic CrMnCoNiCu High Entropy Alloy</b> S.M. Oh and S.I. Hong	39
<b>Susceptibility of Acicular Ferrite and Upper Bainite Microstructures to Hydrogen Assisted Cold Cracking Propagation</b> W. Costin, O. Lavigne, A.G. Kotousov, R. Ghomashchi, I.H. Brown, V. Linton and F.J. Barbaro	44
<b>Effect of Variable Pitch on Cutting Temperature, Cutting Forces and Surface Roughness Using Nitico30 Cutting Tool when End Milling of Stainless Steel 316L</b> A. Latif, M.R. Ibrahim, M.S. Mustapa, N.H. Rafai and C. Prakash	50
<b>Research on Relationship between Cutting Conditions and Chip Formation during End Milling of Aluminium Alloy 6061</b> M.R. Ibrahim, N. Mahadi, A. Latif, Z. Rahim, Z. Mohid, M.S. Mustapa and S.A.C. Ghani	56
<b>Effect of Surface Roughness and Oxidation Conditions on Wettability of Borosilicate Glass Sealant</b> R. Joshi and R. Chhibber	61
<b>Technology of Electrochemical Micromachining Based on Surface Modification by Fiber Laser on Stainless Steel</b> X.H. Li, S.M. Wang and B.B. Xue	67
<b>Experimental Study on the Relationship of Discharge Parameters with Crack Arrest Effects in Inconel 625 Alloy by Electropulsing Treatment</b> J. Yu and Y.C. Liu	73
<b>The Effect of Cutting Speed and Feed Rate on Surface Roughness and Tool Wear when Machining Machining D2 Steel</b> M.R. Ibrahim, T. Sreedharan, N.A. Fadhlul Hadi, M.S. Mustapa, A.E. Ismail, M.F. Hassan and A.M. Tajul Arifin	80

## Chapter 2: Mechanical Properties of Composites and Intermetallic Compounds

<b>Effect of Homogenizing and Age Hardening on Mechanical Property Enhancement of TIG Welded Al6061 SiC<sub>p</sub> Composites</b> P.K. Jayashree, S. Sharma and S. Raviraj	89
<b>Characteristics on Treated Kenaf Fiber Reinforced Polypropylene Composites</b> M.M. Husin, M.S. Mustapa, M.S. Wahab, A.M. Tajul Arifin, R.A.L. Ganasan and F.H. Jais	94

<b>Wear Behavior of <i>In Situ</i> Mg<sub>2</sub>Si Particle-Dispersed Magnesium Alloys</b> K. Asano	100
<b>Investigation of Friction Coefficient for Twaron-Reinforced Brake Shoe Materials</b> Y.Z. Demirhan and R. Kus	106
<b>A Study of the Structural and Mechanical Characterization of Hybrid Nanocomposite Material</b> A.K. Mahmoud, S.I. Al-Nassar, M. Demiral and H.M. Kadhim	111
<b>Fabrication of Al-Based Composites Cylinder Reinforced with <i>In Situ</i> Si/Mg<sub>2</sub>Si Particles and the Research of its Bench Test</b> X.D. Lin, C.M. Liu and J.B. Lu	116
<b>Crushing Response of Green Square Honeycomb Structure from Sugar Palm &amp; PLA</b> Z. Ansari, M.R.M. Rejab, D. Bachtiar and J.P. Siregar	122
<b>Bending Behavior and Electrical Conductivity of Cu/Ni/Al/Ni/Cu Clad Composite</b> H.J. Kim and S.I. Hong	127
<b>Fracture Analysis for Attaching Fiber Reinforced Composite on V-Notch Wedge Structure</b> T.H. Chen	133

### Chapter 3: Polymers

<b>Effect of Calcium Ion Crosslinked Alginate Based Coating on Flame Retardancy of Polyester-Cotton Fabric</b> Y. Pan, L. Song and Y. Hu	145
<b>Fabrication of Micro Fluidic Channels in Polymers by Melt-Electrospinning</b> J. Zeng, C.R. Lin, F.Y. Fang, F. Liang, H. Wang, F.W. Yang and P.X. Wu	151
<b>Preparation of Porous Polymer Membrane with Controllable Pore Size via Spray Spinning</b> W.T. Sun, S.X. Liu, X.Y. Hu, Q.Y. Jia, Y.Q. Shen and L.L. Liu	157
<b>Electrospun PVDF-HFP/BR Rubber Composites for High Performance Solid State Electrolytes</b> J.H. Lin, Y.F. Huang, H.W. Wu, J.H. Li and Y.T. Zeng	163

### Chapter 4: Biomaterials

<b>Adhesion of <i>Candida</i> to Vanillin-Coated PMMA Resin</b> S. Thaweboon, B. Thaweboon and R. Kaypetch	171
<b><i>In Vitro</i> Inhibitory Effect of Vanillin on <i>Candida</i> Biofilm</b> S. Thaweboon, B. Thaweboon and R. Kaypetch	177
<b>Physical Properties of Irreversible Hydrocolloid Impression Material Incorporated with Silver-Nanoparticles</b> M. Rungkiertsakul, P. Sawaengkit, P. Nisalak, S. Thaweboon and P. Churnjitapirom	182
<b>Antimicrobial Properties of Ag Nanoparticle-Incorporated Irreversible Hydrocolloid Impression Material</b> N.P. Wangchuk, P. Sawaengkit, P. Nisalak, S. Thaweboon and B. Thaweboon	187
<b>Evaluation of Mechanical Properties of PEEK HAp Bio-Composite Used in Load Bearing Bone Implants</b> S.S. Kumar, R. Chhibber and R. Mehta	193
<b>Surface Modification Effects on Microstructure and Mechanical Properties of Bio-Titanium Alloys</b> A. Zaki, S. El-Hadad and W. Khalifa	199

### Chapter 5: Advanced Functional Materials

<b>Influence of Modified Carbon Fiber on Properties of Paper Based Friction Materials</b> K.P. Li, C.S. Zhao, C.J. Wu, Y.F. Jiang and W.J. Han	207
<b>Preparation of Copper-Doped Nickel Oxide Thin Films by Sol-Gel Method Using Nickel and Copper Acetate</b> T. Ehara, T. Sasaki, M. Abe and T. Nakanishi	213

<b>Development of an Optimal Heat Treatment Regime for a Gradient Material Containing Tungsten Carbide</b> I.V. Chumanov and A.N. Anikeev	219
<b>Investigation of the Influences of Reaction Temperature and Time on the Chemical Reduction of Graphene Oxide by Conventional Method Using Vitamin C as a Reducing Agent</b> C. Sriwong, K. Choojun and S. Kongtaweelert	225
<b>Performance Comparison of Phase Change Materials for Thermal Energy Storage</b> J. Korody and P. Dinesha	231
<b>Carbon Nanotube-Poly(Vinylidene Fluoride) Composite Films for Strain-Sensing Applications</b> G.S. Kumar, D. Vishnupriya, R. Antao and T.U. Patro	237
<b>Synthesis and Characterization of TiO<sub>2</sub>/CNT Nanocomposites for Azo Dye Degradation</b> S.H. Hsieh and W.J. Chen	243
<b>Exhaust Emission Reduction from Compression Ignition Engine by Using Palm Biodiesel Blended with Nano Zinc Oxide Additive</b> P. Wanriko and K. Fangsuwannarak	249
<b>Synthesis of Hydrophobic Viscose Rayon Fiber Using Nanorod Silica and Chitosan as Surface Modifier</b> A.S. Pradipta, W.E. Mulyani and B.S. Purwasasmita	255

## Chapter 6: Building Materials

<b>Analysis and Application of New-Type High Performance Cold-Patch Mixture for Pavement</b> X. Guo, W. Li, X. Huang and D.G. Zhai	263
<b>Research on the Performance of Polymer Modified Cement Matrix Grouting Material Mixed with Polyvinyl Alcohol Fiber</b> W. Li, X. Guo and P. Liu	269
<b>The Effect of High Temperature Exposure on Properties of Hybrid Fiber Reinforced UHPC</b> J. Fořt, D. Čítek, M. Pavlíková and Z. Pavlík	275
<b>Properties of Foamed Lightweight Material Produced Using Blended Cement-Limestone Powder</b> T.P. Huynh and C.L. Hwang	280
<b>Properties of Modified Lime-Based Plasters for Renewal of Historical Buildings Exposed to Accelerated Carbonation Test</b> L. Zemanová, J. Pokorný, M. Pavlíková and Z. Pavlík	286

## Chapter 7: Computational Modeling and Special Experimental Methods

<b>An ISODATA Approach to the Estimation of Atomistic Definition for Continuum Stress</b> B.L. Du and Q.F. Jian	293
<b>Evaluation of Tri-Axial Magnetostriction in Cube-Oriented Fe-Ga Single Crystal by Using X-Ray Diffraction Method</b> T. Ikeuchi, A. Koyama, M. Imafuku, S. Fujieda, Y. Onuki and S. Suzuki	300
<b>Multi-Phase Microstructures for Materials with Extreme Bulk Modulus or Thermal Conductivity</b> A. Radman, X.D. Huang and Y.M. Xie	306
<b>Continuum-Micromechanical Modeling of Microcapsules-Based Composites</b> A. Ahmed, K. Sanada, M.A. Fanni and A.A. Moneim	311