

Table of Contents

Preface, Committee

Chapter 1: Polymers and Composites

Preparation and Characterization of Composite Membrane Chitosan-Silica-Polyethylene Glycol	
W. Mahatmanti, N. Nuryono and D. Siswanta	3
Synthesis and Characterization of Poly(Lactic Acid)-Grafted Natural Rubber by Reactive Melt-Blending Technique	
Y. Wongngam and C. Pattamaprom	7
Effects of Impregnation of Organoclay in the Thermo-Physico-Mechanical Properties of Recycled Composite Aluminates as Barrier Material	
D. Senoro, A. Grino and E. Chan	12
Preparation Polyisoprene (NR) and Polyacrylonitrile Rubber Latex Glove Films by Dipping Ceramic Hand Molds Process and their Properties	
P. Sornsanee, V. Jitprarop and N. Tangboriboon	21
Alternative Methods for Accelerating Mechanical Stability of Concentrated Natural Rubber Latex	
D. Pimalai, Y. Wongngam and C. Pattamaprom	26
Plasma Surface Modification of Poly(Lactic-co-Ricinoleic Acid)Urethane: Chemical and Biological Characterizations	
C.C. Sumaray, E.T. Ngan and L.Q. Reyes	31
Barrier Properties Analysis of Polyethylene Terephthalate Films (PET) Coated with Natural Polyphenolic and Gelatin Mixture (PGM)	
S. Ishtiaque, S. Naz, J. Ahmed and A. Faruqui	38
Morphology and Structure of Amino Fatty Acid Intercalated Montmorillonite	
L.Q. Reyes	44

Chapter 2: Metals and Alloys

Physical and Mechanical Properties of the Amorphous and Nanocrystalline Alloys	
V.S. Tsepelev, Y.N. Starodubtsev, K.M. Wu, N.P. Tsepeleva and B. Semenov	53
Magnetic and Mechanical Properties of the Amorphous Alloys	
V.S. Tsepelev, Y.N. Starodubtsev, K.M. Wu, N.P. Tsepeleva and A. Taushkanova	58
Ultra-Fine and Nano-Crystalline Structure Induced by Sliding Friction of Carbon Steel	
H. Kato and K. Yasunaga	63
Mechanical Properties of Ni-Pd Thin Films Fabricated by LIGA Process	
Y. Ichinosawa, S. Kinuta and Y. Saotome	68
Thermodynamics on the Modification of Inclusions by Ca and Mg Treatment in GCr18Mo Bearing Steel	
M.R. Qiao, S.Q. Guo, X. Su, H.Y. Zheng and L.B. Qin	73
Thermodynamics of Aluminum Deoxidization Equilibria in GCr18Mo Bearing-Steel	
X. Su, S.Q. Guo, M.R. Qiao, H.Y. Zheng and L.B. Qin	80

Chapter 3: Material Processing and Manufacturing Engineering

Non-Isothermal Crystallization and Viscoelastic Behavior of Polypropylene/Nanoclay Composites Fabricated from Masterbatch by Using a Mini Extruder	
A. Chafidz, R.M. Faisal, M. Kaavessina and D. Hartanto	89
Comparison of Reinforcing Efficiency between Calcium Carbonate/Carbon Black and Calcium Carbonate/Silica Hybrid Filled Natural Rubber Composites	
S. Prasertsri, C. Vudjung, W. Inthisaeng, S. Srichan, K. Sapprasert and J. Kongon	94

Effect of Tool Path Parameters on Part Porosity in Fused Filament Fabrication of Poly(Ethylene-co-Trimethylene Terephthalate) R. Bail	99
Extrusion Temperature and Flow Rate Effects on Tensile Properties of Additively Processed Poly(Ethylene-co-Trimethylene Terephthalate) R. Bail	104
Experimental Investigation of Bouncing-Back of Multidirectional CFRP Laminates during Ultrasonic Assisted Edge Trimming M. Helmy, M.H. El-Hofy and H. El-Hofy	109
Friction Stir Forming for Mechanical Interlocking of Ultra-Thin Stainless Steel Strands and Aluminum Alloys H.M. Tabatabaei and T. Nishihara	114
FEM Analysis of Cold Flaring Process of SUS304 Pipe S. Nishida, J. Ichikawa, Y. Kashitani, K. Tsunoda, Y. Takeuchi, Y. Nitta, Y. Takigawa, A. Aoki and Y. Sato	120
Evaluation of Periodic Wrinkle during Sheet Press Forming Utilizing Frequency Characteristic of Ultrasonic Wave Y. Segawa, T. Kuriyama, H. Harada, Y. Marumo, T.K. Lee and Y. Imamura	127
Evaluation of Material Deformability and Pressure Distribution on a Die Surface under a Tool in Spot FSF T. Ohashi, X. Tong, Z.J. Zhao, H.M. Tabatabaei and T. Nishihara	132
Multi-Objective Optimization of EDM Process Parameters by Using Passing Vehicle Search (PVS) Algorithm T. Ram Prabhu, V. Savsani, S. Parsana, N. Radadia, M. Sheth and N. Sheth	138
Roll Casting of Al-40%Sn-1%Cu Strip T. Haga, R. Onishi, H. Watari and S. Nishida	147
Gas Nitriding and Oxidation of Ti-6Al-4V Alloy D.B. Lee, W.A. Abro, K.S. Lee, M.A. Abro, I. Pohrelyuk and O. Yaskiv	155
Prevention of Solidification of Al-40%Sn-1%Cu in Melt Pool on the Roll Casting Using Unequal Diameter Twin Roll Caster T. Haga, R. Onishi, H. Watari and S. Nishida	160
Hydrogen Influence on Microstructure and Properties of Novel Explosive Welded Corrosion Resistant Clad Materials M. Gloc, H. Słomińska and Ł. Ciupiński	167
The Innovation as a Source of Traditional Products' Survival: The Bobbin Lace from Peniche I. Bieger, C. Carvalho and G. Montagna	173

Chapter 4: Engineering Mechanics of Materials

Two-Dimensional Finite Element Analysis for Investigating Stresses Developed in Cement and Bone Layers in Total Knee Replacement Usman and S.C. Huang	181
Application of Coupled Ductile Fracture Criterion to Plane Strain Plates F. Šebek, P. Kubík and J. Petruška	186
Fatigue Failure of a Composite Wind Turbine Blade at the Trailing Edge Z.J. Pan, J.Z. Wu, J. Liu and X.H. Zhao	191
Four-Parameter Viscoelastic Model for the Plates of Uniformly Varying Cross-Section G. Tekin and F. Kadioğlu	196
A Micro Constitutive Model for Ultra-High Molecular Weight Polyethylene Orthopaedic Implant Bearings C.Y. Chung	201
Eccentricity Effect in the Hole-Drilling Residual Stress Measurement T. Návrát, D. Halabuk, M. Vlk and P. Vosynek	208
Stress Analysis of the Thin Coating of the Trapeziometacarpal Replacement T. Svojanovský and V. Fuis	213
Out-of-Plane Deformation Measurement of Soft Solid Using a Stereo Camera System J.A. Pramudita, T. Isawa and Y. Tanabe	218

Chapter 5: Building Materials

Relationship between UPV and Strength of Rubber-Concrete M. Shi, D.H. Jeong, S.W. Lee and Y. Choi	225
Preliminary Study on Reaction of Fresh Concrete with Carbon Dioxide M.J. Lee, M.G. Lee, Y.C. Wang, Y.M. Su and J.L. Deng	230
Incorporating Waste Material in Road Construction for Sustainable Development M.S.S. bin Mohmad Shariff and M.S.F. bin Md Noor	235
An Experiment on Bond-Slip Behavior of Epoxy Coated Rebar Made by IGBT Method J.S. Kim, S.H. Lee and J.W. Choi	241
Durability of Cement Based Mortars Containing Crystalline Additives N. Žižková, L. Nevřivová and M. Lédl	246
Influence of a Crystalline Additive on the Porosity of Cement Mortars L. Nevřivová, N. Žižková and M. Lédl	254
The Bearing Capacity of the Pre-Compressed Concrete Filled Steel Tube Columns A.L. Krishan, E.P. Chernyshova and R.R. Sabirov	261
Study of the Effect of Waste Materials on Soil Properties C. Kooleshwarsingh and M.S.S. bin Mohmad Shariff	267

Chapter 6: Bio- and Chemical Technologies and Materials

Non-Isothermal Combustion Properties of Plant Biomaterial Using TG-DSC Technique L. Xu, Y. Jiang, R. Qiu and W. Li	275
Application of Coconut-Shell Activated Carbon as Heterogeneous Solid Catalyst for Biodiesel Synthesis Y.S. Pradana, A. Hidayat, A. Prasetya and A. Budiman	280
Bio-Synthesis of Eicosapentaenoic Acid (EPA) from Palm Oil Mill Effluent Using Anaerobic Process H. Sudibyo, Y.S. Pradana, B. Budhijanto and W. Budhijanto	286
Potential of Agro Waste-Derived Adsorbent Material for Colour Removal Z. Daud, N. Nasir, A.A. Kadir, A.A. Abdul Latiff, M.B. Ridzuan, H. Awang and A. Abdul Halim	292
Micro-Peat as a Potential Low-Cost Adsorbent Material for COD and NH₃-N Removal Z. Daud, M.A. Rosli, A.A. Abdul Latiff, M.B. Ridzuan, H. Awang and A. Abdul Halim	297
Development of Natural Fiber as a Filter Media in Removing Organic Pollutants from Greywater M.B. Ridzuan, Z. Daud, Z. Ahmad, N.A. Md Nordin and Z. Zakariah	302
Adsorption of Congo Red Dye on HDTMA Surfactant-Modified Zeolite A Synthesized from Fly Ash Jumaeri, S.J. Santosa and Sutarno	307
Oxidation of Palm Shell Coal Using HNO₃/H₃PO₄-NaNO₂ System for Adsorbents S. Rungrodnimitchai and S. Hiranphinyophat	312
Studies on Physical and Mechanical Properties by Soda-AQ Pulping of Napier Grass Z. Daud, M.Z. Mohd Hatta, M.B. Ridzuan, H. Awang and S. Adnan	318

Chapter 7: Functional Materials

Characterizing Defects Induced by Irradiation Damage in 6H-SiC X.N. Yao, Y.H. Wang and Y.T. Wang	325
A Novel Charged Iridium Polymer for Polymer Light Emitting Diode W. Sombat, N. Wongsang, S. Sahasitthiwat and R. Jitchati	332
A New Functional Material of Immobilized Ionic Liquid on Cotton Cellulose J. Tang, A. Yohannes, X.T. Feng and S. Yao	337
Characteristics on Physical-Chemical-Thermal Properties of Eggshell Membrane for Biomaterial Applications N. Wangrunroj, N. Soontorntepwarakul, S. Samattai and N. Tangboriboon	342

Use of Thiols to Enhance the Hydrophobicity of Silver Nanoprisms C.Y. Chen, J.C. Kan and M.T. Lee	347
The Utilization of Ground Tire Rubber as Ion Exchange Materials S. Rungrodnimitchai, S. Mayod and S. Tanasarn	352

Chapter 8: Materials for Solar Cells

A Varied Alkyl Chains of Ruthenium(II) Complexes for Dye Sensitized Solar Cells (DSSCs) C. Talodthaisong, K. Wongkhan and R. Jitchati	359
Synthesis and Electrical Conductivity of N-(3-(Trifluoromethyl)Benzylidene)Thiosemicarbazide towards Dyes Sensitized Solar Cell U.M. Osman, A.S.N. Farizal, N. Ishak, R. Mohd Hasmizam and M.I.N. Isa	364
Thiocyanate Free Ruthenium(II) Complexes for Dye Sensitized Solar Cells (DSSCs) U. Mahanitipong, P. Prompan and R. Jitchati	369
Experimental Studies of Fire from CIGS Thin Film Solar Module Back L.L. Yin, Y. Jiang and R. Qiu	374