

Table of Contents

Preface

Chapter 1: Nanomaterials and Nanostructures

Vapor-Phase Axial Deposition Synthesis of SiO₂ and SiO₂-TiO₂ Sponge-Shaped Nanostructures

M.C.P. Soares, E.A. Schenkel, B.F. Mendes, E. Fujiwara, M.F.M. Santos, G. Perli and C.K. Suzuki

3

Structural Investigations on Hydrothermally Grown ZnO Nanostructures

C.T. Kuo, J.C. Lee, Y. Chen and Y.F. Wu

9

Effect of Processing Parameters on the Diameter and Morphology of Electrospun Iron-Modified Montmorillonite (Fe-MMT)/Polycaprolactone Nanofibers

G.M.A. Tajanlangit and L.J.L. Diaz

14

Anodization of Highly Ordered Titania Nanotube Prepared with Organic Electrolyte

B. Suharno, N. Ramadhanti, N. Aryani, A. Zakiyuddin and S. Supriadi

23

Study on Mechanical Properties of Multilayer Graphene/Epoxy Nanocomposites

J.C. Huang and T.C. Lin

29

Chapter 2: Polymers and Composites

Effects of Micro-Eggshells Filler on Tracking and Erosion Resistance of Silicone Rubber Composites

P. Khaigunha, T. Wongwuttanasatian and A. Suksri

37

Study of Machining Parameter Optimization in Drilling of Magnesium Based Hybrid Composites Reinforced with SiC/CNT

J.S.S. Babu, M. Heo and C.G. Kang

42

An Internal Damage Real-Time Monitoring System Using CFRP-OFBG Plates

J. Zhao, P.F. Liu and Y.Y. Xu

47

Effect of Surface Treatment on Interface Strength of CFRP/Metal Hybrid Composites

M. Heo, M.S. Lee, H.Y. Seo and C.G. Kang

53

Assessment of Silicone Rubber Properties Using Dynamic Modelling Simulation

R.W. Sharudin and M.A. Nik Salwani

58

Chapter 3: Steel, Alloys, Machining Technologies

Thermomagnetic Analysis of the Crystallization in Soft Magnetic Nanocrystalline Alloys

V.S. Tsepelev, Y.N. Starodubtsev, K.M. Wu and N.P. Tsepeleva

67

Semi-Solid Forging of Mg Alloy AZX1311 and Mechanical Properties

S. Nishida, M. Hagiwara, K. Tsunoda, R. Nakanishi, T. Tanaka and T. Haga

72

Grain Characteristics of 1235 Aluminum Alloy during Rolling

W.D. Yan, G.S. Fu, X.M. Zhou and D.D. Chen

77

Macrosegregation Characteristics of Ferrite and Austenite Stabilizer Elements in Large Size High Strength Steel Ingot

A. Loucif, C. Zhang, M. Jahazi and L.P. Lapierre-Boire

82

Corrosion Behavior and Mechanical Properties of New Developed Oxide Precipitation Hardened Steels

O. Khalaj, E. Saebnoori, H. Jirková, O. Chocholaty and J. Svoboda

87

Effect of Space Holder Size on the Porous High Purity Aluminum Property

S. Khamsuk, K. Choosakull and P. Wanwong

93

Machining Parameters Mapping's of Inconel 718 and Aluminum Alloy 1100 in Micro-Milling Process

G. Kiswanto, M. Azmi, A. Mandala, D.L. Zariatin and T.J. Ko

99

Preliminary Design of Two Dimensional Vibration Assisted Machining System for Multi-Axis Micro-Milling Application	
G. Kiswanto, Poly, Y.R. Johan and T.J. Ko	105
Mechanical Characterization of Aluminium Alloy 6061 Powder Deposit Made by Friction Stir Based Additive Manufacturing	
A. Mukhopadhyay and P. Saha	110
Investigation on Friction Coefficient Considering Al-Si Coating Layer Fracture of Boron Sheets in Hot and Cold Deep Drawing	
M.S. Lee, J. Park, J.S.S. Babu and C.G. Kang	117
Machined Surface Roughness Geometry Model Development on Ultrasonic Vibration Assisted Micromilling with End Mill	
G. Kiswanto, Y.R. Johan, Poly and T.J. Ko	122
Internal Friction Study of the Bake-Hardening Properties on Low Carbon Steel Influenced by the Degree of Pre-Deformation	
X.L. Jin	128
The Effects of Cutting Parameters to the Surface Roughness in High Speed Cutting of Micro-Milling Titanium Alloy Ti-6Al-4V	
G. Kiswanto, A. Mandala, M. Azmi and T.J. Ko	133
Burring Process and Fracture Criterion of Large Diameter Steel Pipe	
S. Nishida, D. Uematsu, N. Ikeda, K. Ogawa, M. Hagiwara and Y. Sato	139
Burr Formation in Casting Using Vertical-Type High-Speed Twin-Roll Caster	
T. Haga, T. Yamashiki, H. Watari and S. Nishida	146
Casting of Thin Bare Wire Using Wheel Caster Equipped with Rotating Side-Dam Plates	
T. Haga, K. Itou, H. Watari and S. Nishida	152
Wear and Adhesion Properties of High-Pressure Torsion Processed Carbon Steel	
H. Kato, K. Yamashita and Y. Todaka	157
Experimental Investigation on the Failure Mechanism of Grooved Steel Plate Impacted by Projectile with Different Nose Shapes	
N. Zhou, J.X. Wang, Z.B. Tong and S.Z. Tang	162

Chapter 4: Materials for Biomedical Application

Formation of TiO₂ Thin Film on Antibacterial Metal Injection Molding Stainless Steel Orthodontic Bracket 17-4 PH Using Physical Vapor Deposition Method	
S. Supriadi, A. Ovilia, N. Ilmaniar and B. Suharno	169
Alkali-Heat Treatment of Ti-6Al-4V to Hydroxyapatite Coating Using Electrophoretic Method	
S. Supriadi, S.L. Putri, R. Ramadhan and B. Suharno	175
The Mechanical Properties of Sisal/PMMA and Sisal/Carbon/PMMA Biomedical Composites	
H. Sosiasi, Y.A. Binangun, A.P. Utama and Sudarisman	181
Fish Scale Collagen Functionalized Thermo-Responsive Nanofibres	
K.Y. Tshai, M.H. Chin, S.S. Lim, H.S. Loh, H.N.E. Yong and T. Nuge	189

Chapter 5: Building Materials and Engineering

The Measurement of Shrinkage: Influence of Specimen Size	
M. Alexa, B. Kucharczyková, D. Kocáb and R. Halamová	197
Effect of Partial Oxidation Rubber on Hydrophilicity of Cement Composites	
C.Y. Chen, T.H. Wang and M.T. Lee	202
Effect of CO₂ Curing on the Strength of High Strength Pervious Concrete	
M.G. Lee, Y.C. Wang, W.X. Xiao, M.J. Lee and T.Y. Huang	207
Study on Fatigue Life of Cement Stabilized Macadam Base during Crack Expanding Phase Based on Accelerated Loading Test	
W. Zeng, R. Ma, F. Chen, K. Zhong and X.C. Ma	213
Wind Speed Effect on the Time Available for Compaction of Warm Mix Asphalt (WMA)	
W. Hashim, N.S.F. Mustapa, A.K. Arshad, E. Shaffie and N.I.F. Md Noh	220

Analysis of Lateral Torsional Buckling Strength of Single Symmetric I Beam	226
W.H. Hsu, Y.X. Liu, K.Z. Ho and W.T. Hsu	
Structure Monitoring and Long-Term Behavior Prediction of Wall-Piloti Structure	232
S.H. Kim and H.G. Park	
Application of Bacteria as Self-Healing Agent for the Concrete and Microscopic Analysis of the Microbial Calcium Precipitation Process	237
Z. Prošek, P. Ryparová and P. Tesárek	
Pilot Study of Mechanical Waves Passing through Fine-Grained Cement Composite during the Early Hydration Process	243
M. Hoduláková, L. Topolář and B. Kucharczyková	

Chapter 6: Materials and Technologies in Biomass Processing and Chemical Engineering

The Functionalization of Activated Carbon by Oxidation	251
S. Rungrodnimitchai and S. Hiranhinyophat	
The Formation of Local Catalyst from Zeolite, Characterization and Performance in the Reaction	257
Z. Mufrodi, E. Astuti and G.I. Budiarti	
Impact of Pulsed Electric Field on Glycerin Sedimentation from Biodiesel Production Process	262
T. Hinthao, T. Wongwuttanasatian and A. Suksri	
Upgrading Bagasse Quality by Torrefaction for a Biomass Power Plant	267
S. Sirijuncheun, V. Seithantanabutara and T. Wongwuttanasatian	
Identification of Cacao Peels Potential as a Basic of Electrodes Environmental Friendly Supercapacitors	274
Y. Yetri, Mursida, D. Dahlan, E. Taer, Agustino and Muldarisnur	
Weighted Spacer Design for Elevated Temperature Conditions to Mitigate Barite Settling by Identifying Suitable Viscosifier	282
S.S. Pandey, R. Tripathi and G.S. Kumar	
Correlation between Void Fraction and Two-Phase Flow Pattern Air-Water with Low Viscosity in Mini Channel with Slope 30 Degrees	289
Sukamta and Sudarja	