

Table of Contents

Preface

Chapter 1: Composites

Preparation and Properties of Tea Polyphenol Modified Graphene Oxide/Epoxy Resin Composites

X.Y. Ren, H. Chen, J. Wu and H.B. Liu 3

Two-Stage Sintering of Alumina-Y-TZP (Al_2O_3 /Y-TZP) Composites

S. Sivanesan, T.H. Loong, S. Namasivayam and M.H. Fouladi 12

Pressing and Bonding Strength of Metal Matrix Composite

Y.C. Dai, H. Wang, C. Yang and D. Jiang 19

Influence of Molding Pressure on Properties of Al_2O_3 - Al Composite Materials Sintered via Vacuum Sintering Method

R.H. Wang, A.X. Chen, C. Yang, F. Wang, D.M. Du, S.B. Li, J.G. Song and L. Chen 27

Kinetic Processes in Polydisperse Systems: Experience of Practical Approximation

I. Garkina and A. Danilov 33

Chapter 2: Nanomaterials and Nanofabrication

Synthesis of Diamond-Like Structures by Method of Mechanochemical Treatment of Nano-Carbon Materials (Taunit)

V.A. Chaika, V.V. Savin, L.A. Savina, A.V. Osadchy and I.S. Zherebcov 41

Optical and Electrical Properties of Diamond-Like Carbon Thin Film with Deposition by ECR-CVD System

T. Srisantirut and W. Pengchan 47

Highly Increased Flow-Induced Voltage Generation on Hybrid Membranes of Monolayer Graphene and Single-Walled Carbon Nanotubes

J.R. Chae, C.Y. Shul and W.S. Jung 53

Effect of Reaction Time on Surface Nano-Structure of TiN Oxide Nanofilm by Hydrothermal Method

C. Yang, F. Wang, S.B. Li, T.T. Xia, R.H. Wang, M.H. Xu and J.G. Song 58

Toughened Poly(Trimethylene Terephthalate) by Melt Compounding with Functionalized Graphene Oxide Nanocomposites

K.Y. Wang 64

Controlled Hydrothermal Synthesis of $\text{K}_2\text{Ti}_6\text{O}_{13}$ Nanowires and their Photo-Electronic Response

Y.X. Chen, M.W. Ji and J. Wang 70

Electrochemical Degradation of p-Nitrophenol on Cu Nanowires and Nanocubes

W.M. Zhang, M.W. Ji and J. Wang 76

Photoelectric Response Difference between KTaO_3 / Au and $\text{K}_2\text{Ta}_2\text{O}_6$ /Au Nanocrystals Resulting from Potassium Tantalate Structure

S.D. Chang, M.W. Ji, C.X. Yan, B. Li and J. Wang 83

Preparation and Characterization of *In Situ* Nanocomposites of Graphene Nanosheets/Polyurethane

G.L. Lv, Y.Y. Li, C. Fei, Z.H. Shan, J. Gan and M. Zhao 90

Crystalline Morphology and Crystallization Behavior of Poly(Trimethylene Terephthalate)/Functionalized Graphene Oxide Nanocomposites Prepared by Melt Compounding

K.Y. Wang 96

Microstructure Analysis and Preparation of Graphene Reinforced Aluminum Matrix Composites

P. Liu, F.E. Sun, S.L. Cheng, L.L. Liu and Y.B. Gao 102

Analysis of Electroluminescence Application on Display

Y.M. Zhou, Z.M. Jiang and Z.W. Qian 107

Preparation and Characterization of 3-Glycidoxypyrtrimethoxysilane Functionalized Graphene Oxide K.Y. Wang	112
--	-----

Chapter 3: Properties of Steel and Alloys, Processing Technologies and Manufacturing Processes

Low Cycle Fatigue Life Evaluation According to Temperature and Orientation in Nickel-Base Superalloy I.K. Heo, D.H. Yoon and J.H. Kim	121
Effect of Frequency to Ultrasonic Vibration-Assisted Wire-EDM P. Nakwong and A. Muttamara	127
Deformation Analysis of TC4 Titanium Alloy Shell Material R.S. Wen and Y. Zhang	132
Cr12MoV Die Repair Experiment Based on Laser Cladding with Wire Y. Yin, Y. Wang, Z.R. Tan and W.J. Yu	137
Effect of Citric Acid on Cerium Conversion Coating of Hot-Dip Galvanized Steel S.H. Zhang, B. Yang, M.D. Li, W. Zhai, Z.G. Wang and S. Li	144
Subsurface Stress Distribution and Failure of PPS Thrust Bearings under Rolling Contact Fatigue in Water X.C. Shi, A. Adachi and K. Kida	152
Study on the High Temperature Creep Behavior of 30Cr25Ni20 Heat-Resistant Steel Y. Yang, X.D. Wang and W.F. Tang	157
Effect of Different Hole-Making Technology on Fatigue Properties of Directionally Solidified Alloy IC10 Y.D. Lian, Z. Xu, Q. Gao, L. Liu and Z. Wen	163
Control of Microstructure and Properties of Welded Joints of Heavy Structures of Low Alloy High Strength Steels Z.L. Wang	171
Effects of Mixed Mode Loading Conditions on Fatigue Crack Growth Rate S.H. Hong, S.D. Kim and J.H. Kim	176
Fundamental Research on Gasification Dephosphorization with Coke Powder Reducing Converter Molten Slag C.X. Li, Y.K. Xue and S.H. Wang	182
Experiments and Regression Analysis of Grinding Hardened Layer Depth Based on Transverse Feed S.X. Gao, J.D. Liu, Z.L. Xu and X.F. Yang	190
Throughput Estimation Model of Cluster Tool in Semiconductor Manufacturing Y.M. Tu	196
An Intelligent Optimization System for PIM Process W.C. Chen, T.H. Chen, D.T. Chang and M.H. Nguyen	203
Formation of Feed-Direction Burr in Axial Vibration Drilling G.C. Wang, G.Y. Xu and T. Pang	211
Main Features of High Speed Machining Chucks and their Selection G.C. Wang, T. Pang, G.Y. Xu and D. Jiang	217
Failure Observation of 3D-Printed Thrust Bearing Specimens with Inner Defects in Water Conditions K. Mizobe, T. Atsumi and K. Kida	224
Welding Repair of High Chromium Cast Iron Defects X.H. Li	229
Research on Base Welding Technology of Alkaline Welding Rod with Arc Method X.H. Li	233
New Low Alloy High Strength Steel Welding Procedure Evaluation X.H. Li	238
Study on Welding Technology of Low Alloy High Strength Steel M. Hu	242
Study on Fatigue Life of Straight Hole Plate of Directionally Solidified Alloy IC10 Y.D. Lian, Z.Z. Xu, Q. Yin, L. Liu and Z.X. Wen	248

Study on Particle Modified ABS in 3D Printing J. Wen, Q. Zhang, Z.F. Zhu and F. Wang	256
Effect of Different Aging System on Microstructure and Mechanical Properties of X2A66 Alloy J.J. Xu, R.C. Guan and M. Jiang	262
Optimization of Precipitation Phase Type and Mechanical Properties of X2A66 Alloy by Pre-Deformation Treatment M. Jiang, R.C. Guan and J.J. Xu	268
Study on Fatigue Properties of Copper Alloy Netting Structure S.M. Wang, Y. Qiu, J.J. Guo, T.P. Yuan and H.Y. Liu	275

Chapter 4: Measurements and Modeling of Materials Properties and Materials Behavior

Evaluation of Wickability of Quick Dry Inner Wear W.Y. Wang, H. Heng, H.H.L. Yim, C.W. Kan, N. Sasithorn, P. Wangkanai, N. Vuthiganond and R. Mongkholrattanasit	285
A Study of Wickability of Gauze Products for Infant W.Y. Wang, Y.L.S. Yau, C.W. Kan, K. Manarungwit, N. Rungruangkitkrai and R. Mongkholrattanasit	291
Synthesis and Clay Anti-Swelling Properties of Diethyl Dodecyl Allyl Ammonium Chloride Y.L. Ma, R.J. Xie, H. Zheng and C. Zhu	297
Microstructure Investigation of He⁺- Implanted and Post-Implantation-Annealed 4H-SiC L.Q. Zhang, H.P. Liu, L. Kang, T.M. Zhang, Y.G. Chen, X.L. Zhang, Z.N. Ding, J.Y. Li, J. Liu, J.Y. Li and C.H. Zhang	302
Thermal Management of a Li-Ion Battery for Electric Vehicles Using PCM and Water-Cooling Board G.Y. Yu, S.W. Chiang, W. Chen and H.D. Du	307
Observation of Tribological Fatigue Fracture on PEEK Shaft with Artificial Defect under One-Point Rolling Contact by Using 2.5D Layer Method H. Koike, S. Yamada, G. Deng, K. Mizobe, T. Yamada and K. Kida	314
Multilayered Elastic Medium under Axisymmetric Loading and Surface Energy K. Tarntira, T. Senjuntichai and S. Keawsawasvong	320
Effect of Aspect Ratio on Horizontal Field Magnetoresistance T. Phetchakul, Y. Chemthung and A. Poyai	327
Observation of Crack Growth Behavior of 400µm Cracks in 4.762mm Silicon Nitride Balls under Cyclic Compressive Load T. Toriki, T. Matsui and K. Kida	335
Effects of CeO₂ Addition on Slip - Cast Yttria Tetragonal Zirconia Polycrystals Toughened Alumina (ZTA) S. Sivanesan, T.H. Loong, S. Namasivayam and M.H. Fouladi	340

Chapter 5: Materials for Biomedical Application

Antibacterial Properties among Different Concentration of Bioactive Glasses T. Wanitwisutchai, N. Monmaturapoj, R. Srisatjaluk, K. Subannajui, N. Anuwongnukroh, S. Dechkunakorn and P. Pongprueksa	349
Comparison of Three Commercial Latex and Non-Latex Orthodontic Elastic Bands S. Malanon, S. Dechkunakorn, N. Anuwongnukroh and W. Wichai	354
Chemical Constituents of the Aerial Parts of Scoparia Dulcis and Anti-Cancer, Anti-Inflammatory Activities N.N.T. Tin, N.D.T. Truc, H.T.T. Hang, P.T.N. Trinh, L.G. Bach and L.T. Dung	360
Preparation, Characterization and Hemostatic Properties of Chitosan Caffeates S.T. Lu, D.Y. Zhang, Z. Hu, S.D. Li and P.W. Li	365
Comparison of Mechanical Properties of Plain and Reversed Curve Nickel-Titanium Archwires K. Pongpat, N. Anuwongnukroh, S. Dechkunakorn, W. Wichai and P. Tua-Ngam	372

Shear Bond Strength of Experimental Light-Cured Orthodontic Adhesives K. Nimcharoensuk, N. Anuwongnukroh, S. Dechkunakorn, V. Sattabanasuk, W. Wichai and P. Sunintaboon	378
--	-----

Chapter 6: Materials and Technologies for Construction

Effect of Shrinkage Reducing Admixture on Shrinkage and Crack Properties of Cement Based Materials Y. Yao, H. Wu, L. Wang and R.J. Gao	387
Water Resistance Modification of Magnesium Oxychloride Cement with $H_3PO_4/Na_2O \cdot xSiO_2 \cdot nH_2O$ T.B. Fan, Y.F. Hao, L.X. Li and F.Q. Zhao	393
Correlation between Unconfined Compressive Strength and Penetration Index Obtained from DCP Tests for Cemented Lateritic Soils A. Uchaipichat	399
A Model for Bond Strength in Presence of Corrosion in Concrete A. Cesetti, P. Savino and F. Tondolo	404
Effect of High Temperature Process on Microstructure and Properties of Industrial Steel Slag Cement F. Wang, M.H. Xu, R.H. Wang, C. Yang, A.X. Chen, S.B. Li, J.G. Song and X.Q. Yang	413
Experimental Study on Permanent Deformation of Fine Sandy Subgrade Filling in Coastal Region D. Zhou	419
Rebar Anchor Plate Research and Application K.J. Shao, Z.B. Li and Z.Q. Zhang	425
Evaluation on Sulfuric Acid Resistance of Concrete Protected by Biomimetic Coating Mortar H.S. Yoon and K.H. Yang	431
Axial Behavior of Columns Strengthened with Seismic RC Jacket Section Y.H. Hwang and K.H. Yang	437

Chapter 7: Materials and Technologies for Chemical Production and Processing

Synthesis of Cerium Phosphate White Pigments from Cerium Oxalate H. Onoda and R. Tanaka	445
Desorption of Mercury Complex from Fe-Modified Montmorillonite Adsorbent Membrane M.J. Lodo and L.J.L. Diaz	451
$Ni_{0.75}Fe_{0.25}$ Coated Tubular GDC Anode for Cathode-Supported IT-SOFC with High Anode Porosity H.X. You, L. Peng and Q. Wang	457
Congo Red Dye Removal Using Ca-Al Layered Double Hydroxide: Kinetics and Equilibrium H.T.N. Thi, D.C. Nguyen, T.T. Nguyen, V.T. Tran, H.V. Nguyen, L.G. Bach, D.V. N-Vo, D.H. Nguyen, D.V. Thuan, D.T. Sy and T.D. Nguyen	463
Effects of Extraction Conditions on Total Phenolic Content and Total Flavonoid Content of Roselle (<i>Hibiscus sabdariffa</i> L.) Extracts N.Q. Duy, M.L.T. Binh, M. Thuan, N.T.T. Van, T.D. Lam, T.H. Tran and P.N.T. Nhan	469
Response Surface Methodology Optimization for Extraction of Natural Anthocyanins from Vietnamese <i>Carissa carandas</i> L. Fruit T.N. Pham, T.H.X. Huynh, B.P. Tran, T.H. Tran, P.T.N. Nguyen, D.C. Nguyen, D.V.N. Vo, T.Q. Toan, B.L. Minh, X.T. Le, L.G. Bach and T.D. Nguyen	475
Microfluidic Chip Injection Photo Solidification Molding Study on Reaction Kinetics J.G. Tong, J.Y. He, P.C. Xie, J.H. Zhang, Z.Q. Shen, J.J. Wang and H.Z. Xu	481
Characterization and Photocatalytic Activity of Microspheres ZnO by Hydrothermal Method X.H. Lin, P.S. Tang, B.B. Wang and H.Q. Tang	487

Synthesis of New Phosphate and the Evaluation as Scale Inhibitor in Oilfield R.J. Xu, H. HE, J. Wang, H.p. HUI and Q.n. LIU	493
Modification of <i>Ligustrum vulgare</i> Leaves Extract as Eco-Friendly Corrosion Inhibitors in Oil Fields R.J. Xu, H. HE, Y.L. Tang, M.L. Gao, H.p. HUI and W.C. Du	499
Study on Source Analysis of the Cation in Produced Water from Sulige Gas Field and Anti-Scaling Measures P. Chang, R.X. Shi, L. Wang, W. Han, C.D. Ye and Y. Ma	505
Preparation and Evaluation of Phosphate Scale Inhibitor for Oilfield Produced Water W. Wang, Y.G. Yi, Z.F. Sun, S.B. Dong and W.C. Du	511
Catalytic Cracking of Oleic Acid over Zeolites M.A.A. Kanak, J.Y. Park and I.G. Lee	517
Effect of Compatibilization on the Melt Properties of Mixed Waste Plastics O. Martikka, S. Nepal, M. Hyvärinen and T. Kärki	522
Effect of Extraction Process on Extraction Yeild, Total Polyphenol Content and Antioxidant Activity of Jasminum Subtriplinerve T.T. Anh, L.T. Hao, L.G. Bach, D.C. Nguyen and T.D. Lam	527