

Table of Contents

Preface, Committees, Sponsor

Chapter 1: Polymers and Composites

Properties Analysis of CIIR/HBP-OMMT Damping Composites Z.J. Nan, Z.J. Li and J.C. Wang	3
Properties Analysis of RTV/TPOSS and RTV/DPTPOSS Flame-Retardant Composites Z.J. Li, Z.J. Nan and J.C. Wang	7
Thermally Conductive Polypropylene/Graphite/Carbon Fiber Composites J.W. Wu, R.R. Qi, X.Y. Ji, P.K. Jiang, X.Y. Wu, X.W. Wang and P. Wang	12
Effect of Fiber Orientation on the Wrinkling Behavior of Thermoplastic Composite L. Chen and S. Kalyanasundaram	21
Wrinkling Behavior of a Woven Thermoplastic Composite Material L. Chen and S. Kalyanasundaram	26
Study on the Application of Carbon Fiber Composite Materials in High-Speed Trains F.F. Wang	31
Research on the Preparation of HA/PEEK Gradient Composites by Impregnation Method and the Biosecurity R. Ma, L.J. Dai, L. Wang and Y.D. Song	35
A Novel Synthesis of Solid-Solid (SSMePCM) by <i>In Situ</i> Polymerization A. Khan, M.N. Pervez, M.A. Saleem, R. Masood and Y.J. Cai	43
Investigation of a Microwave Absorbing Material Based on NBR Y.Q. Yang	49
Application of Chitosan as Scaffold Material of Construction <i>In Vitro</i> Y. Zhang, P.S. Li, D.Y. Chen, H.C. Dong, J.J. Zhang, M.L. Zhuang, K.D. Song and T.Q. Liu	53
Experimental Study on the Tool Wear in Milling Carbon Fiber Reinforced Plastics J.D. Liu, X.F. Yang, Z.L. Xu, Y.S. Li, G.H. Yan and L.K. Huang	57
Preparation and Blood Coagulation Property of Ortho Hydroxytoluene Chitosan J. Guan, Q. He, X.H. Wang, S.J. Huang, Z.H. Li, C.J. Liu, F. Li and Z. Shu	62

Chapter 2: Chemical Materials and Technologies

Research on Crystallinity, Morphology of Cotton Subjected to Enzyme and Crosslinking Treatment M.N. Pervez, F. Shafiq, M.M. Jilani, Z. Sarwar and Y.J. Cai	71
Use Discolor Spectrophotometry to Characterize Chelate Property of Nanoparticle F. Chen, Y. Deng, S.J. Chen, L. Gao and J.L. Yao	77
Effect of Calcination Heating Rate on Microstructure and Performances of NSR Catalyst J. Li, X.Z. Zhang, P. Wang, G.W. Liu, H.C. Shao and G.J. Qiao	81

Chapter 3: Ceramic and Cermet

Prediction of Tool Wear in Pre-Sintered Ceramic Body Micro-Milling H.L. Cheng, J.Z. Li, S.H. Xu and Z.Y. Yu	89
Fabrications of Black Aesthetic Zirconia Ceramics Using Perovskite Pigment L.Y. Qiu, K.X. Du, L. Wang and Y. Xiong	95
Effect of Molding Pressure on Densification of Al₂O₃/Al Cermet Materials R.H. Wang, X.Q. Wang, S. Dong, N. Niu, D.J. Chang, C.F. Yu, J.G. Song and S.B. Li	100
Effect of Auxiliary on the Dispersibility of ZrB₂ Powder in the Liquid J.G. Song, X.Q. Wang, L.T. Liu, Z.H. Li, R.X. Deng, S. Zhao, Q.M. Zhou, S.B. Li and L. Chen	105

Chapter 4: Materials for Application in Electrical and Electronics

Effect of Annealing on Valence Electronic States Related to Mn Ions of $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$ Films	
R.K. Pan, Y. Li, F. Fang, W.Q. Cao and Y.B. He	113
Effect of Electrode Distance on Jetting Behavior of Non-Particle Nano Ag Conductive Ink in Electrohydrodynamic Micro Jet Printing	
B. Xing, C.C. Zuo, F.L. Huang, Y.B. Lu and G.S. Hu	118
Citric Acid Complex Sol-Gel Method to Prepare $\text{Lu}_2\text{SiO}_5\text{:Eu}$ Phosphor	
Y. Yang, L. Yang, Y.L. Chen and M. Yan	122
Electrochemical Decomposition of Poly(Vinylidene Fluoride) Binder for a Graphite Negative Electrode in Lithium-Ion Batteries	
M.J. Kim, C.H. Lee, M.H. Jo and S.K. Jeong	127
The Effect of Mg on the Wetting Behavior of SiC-Al System	
Z.X. Liu and W.S. Lin	132
Magnetic and Photochemical Properties of Cu Doped Hematite Nanocrystal	
M.J. Kang, N.H. An and Y.S. Kang	136
Growth of Single Crystalline TiO_2 Nanorods as a Photoanode for Dye-Sensitized Solar Cell	
C.W. Kim, S.H. Ji, D.I. Kang and Y.S. Kang	144
Research Status and Development of CuInTe_2 Thin Film Solar Cells	
C. Xu, K.G. Liu and M.X. Jing	151
Luminescent Properties and Thermometry of $\text{CaWO}_4\text{:Nd}^{3+}$ in Near Infrared Region	
R.X. Wang and X.B. Luo	156

Chapter 5: Metals and Alloys, Technologies in Metallurgy and Processing

Microstructure Characteristics and Properties of 1561 Aluminum Alloy Weldments Processed by Different MIG Welding	
S.G. Han, S.D. Zheng, D.T. Cai, Y.Y. Yi and Z.Y. Luo	163
Phased Array Ultrasonic Testing of Thin DP Steel Electron Beam Weld Joints	
B. Šimeková, E. Hodúlová and I. Kovaříková	169
The Effect of Air Gap between Casting and Water-Cooled Mold on Interface Heat Transfer Coefficient	
Y.D. Zeng, Q.H. Yao and X. Wang	174
Fatigue of Low Carbon Alloy Steel (JIS S45C) and a New Method of Fracture Surface Analysis	
K. Kida, M. Ishida, K. Mizobe, I. Yoshida, A. Tamura and K. Nakane	181
Investigation of Evaporation in Laser Welding Vacuum Aluminum Alloy	
D. Trushnikov, E.S. Salomatova, V.Y. Belenkiy and T.V. Olshanskaya	186
The Studies of Plasma Torch Processes by Laser Beam Welding	
I.Y. Letyagin, D. Trushnikov and V.Y. Belenkiy	190
The Effect of Reduction Parameter in Processing Lump Ore with Green Sugarcane Bagasse Reductor in Muffle Furnace	
J.W. Soedarsono, C.E. Arifin, J.S. Saragi, A.A. Putra, A. Kawigraha, R.D. Sulamet-Ariobimo and A. Rustandi	195
Effect of Rare Earth Er on Microstructure and Mechanical Properties of Cast Al-Si-Mg Alloy	
Q.L. Li, B.Q. Li, J.B. Li, C.F. Zhang and Y.F. Lan	202
The Relationship of Processing Parameters and Surface Topography of Selective Laser Melted GH4169 Alloy	
B. Liu, P.K. Bai, Y.X. Li and P. Liu	207
Creep Behavior of a Ru-Free Nickel-Based Single Crystal Superalloy at Medium Temperatures	
S. Liang and Z.X. Liu	212

An Experimental Verification of the Applicability of Steels S235 and DD11 for Aseismic Structural Provisions	
J. Protivinsky and M. Krejsa	218
Correlation of Steel Yield Stress and Ultimate Strength - Monte Carlo Simulation via Non-Gaussian Random Variables	
P. Konečný	223
Structure Formation and Nonmetallic Inclusions in Welded Joints when Welding Steel X65 by STT+API Technology	
E.M. Fedoseeva and T.V. Olshanskaya	229
Analysis on the Action of Oxidant in Chemical Mechanical Polishing of 304 Ultra-Thin Stainless Steel	
J.X. Su, Y.A. Peng, Z.H. Liu, Z.K. Wang and S.F. Fu	234
Distribution of Aspect Ratio of Fatigue Crack at Notch Root Depending on Crack Initiation Point of Annealed Steel, JIS S45C	
T. Matsueda, M. Ishida and K. Mizobe	240
Microstructural Evolution and Mechanical Properties of Low C-Mn Steels Subjected to Accelerated Cooling	
L. Li, G. Su and X.B. Li	245
Fractal Geometry in Metallurgy of Welding and Coatings	
E.A. Krivonosova, E.K. Krivonosova and D. Trushnikov	252
Experimental Research of Effects of Electric Parameters on the Machining Speed and Surface Quality in EDM	
X.L. Zhang and Z.X. Wang	257
Casting of Clad Strip of Al-SiC_p, Magnesium Alloy Hard-Brittle Light Material by a Twin Roll Caster	
T. Haga, K. Okamura, H. Watari and S. Nishida	262
Numerical Simulation and Experimental Research on Forging of Cylinder Bottom	
Y.F. Xia, T.Y. Wang, J. Zhao and S.C. Li	267
Mathematical Simulation of Flux Film State in Gap between Mould and Solidified Shell	
L.J. Cao	272
Numerical Simulations of Low Pressure Die-Casting for A356 Aluminum Rims	
P.H. Huang, W.J. Wu and C.H. Shieh	276
Researches on the Temperature Field during the Process of Reparation by Laser Cladding through Simulation and Experiments	
X. Zhang, W. Fu and Q.L. Deng	281
Preliminary Experimental Study of Laser Cladding Repair on Directionally Solidified Blades	
W. Fu, Q.L. Deng and H.Y. Fang	289
Gravity Casting of Al-30vol%SiC_p Plate	
T. Haga, K. Takahiro, S. Wada and H. Fuse	297
Researches of Mechanical Properties of Welded Joint Based on the Method of Micro Sample	
J.Z. Du and Z.Y. Zhao	302

Chapter 6: Coatings, Corrosion and Surface Properties

Morphology, Structure and Corrosion Resistance of Nano-Enamel Coating Changed on Ti-6Al-4V Alloy	
Y.L. Li, Z.R. Huang, Q.D. Zhong, C. Xiao, H. Li and J.H. Sun	309
Electrodeposition and Corrosion Resistance of Cu/Zn/Cu Multilayer Coatings	
J.H. Sun, H. Li, Q.D. Zhong, C. Xiao, Z.R. Huang and Y.L. Li	313
Surface Modification of Aramid Fiber III by the Atmospheric-Pressure Air Plasma Treatment	
F.D. Wang, Y.L. Lv, X. Wei, G. Ling and Z.W. Han	318
Influence of Ta Strengthening on Microstructure and Wear Resistance of Laser Cladding Ni45 Coating	
Q.L. Deng, W. Fu and H.Y. Fang	323
Study on the Interfacial Binding Energy of Plasma Sprayed FeSi Nano-Composite Coating	
C. Xiao, Z.R. Huang, Q.D. Zhong, Y.L. Li, J.H. Sun and H. Li	330

Electrodeposition of Cu-Sn-Graphite-Al₂O₃ Composite Coatings and their Tribological Properties	
X.H. Wang, L.X. Ying, C.J. Zhang and X.P. Lv	335
Characteristics of Laser Cladded Nickel-Based Chromic Carbide Composite Coatings	
S. Dai, D.W. Zuo, X.R. Zhao and J.F. Wang	340
Effect of the Bluing Solution on Corrosion Resistance of the Oxide Film Prepared in Steel	
H. Li, J.H. Sun, Q.D. Zhong, Z.R. Huang and Y.L. Li	345
Investigation in the Influence of Surface Treatment on Mechanical and Electrochemical Corrosion Properties of Ti-6Al-4V Alloy	
Z.R. Huang, Y.L. Li, Q.D. Zhong, C. Xiao, H. Li and J.H. Sun	350
Preparation and Mechanical Properties of Diamond Honing Oilstone	
J.N. Tao, X.Z. Zhang, G.W. Liu, Z.W. Xu, H.C. Shao and G.J. Qiao	354

Chapter 7: Materials and Technologies in Building

Experimental Testing of Shear Resistance on SFRC Slab Structures	
R. Čajka, M. Smirakova and J. Vaskova	363
The Measurement of SVOC Emission Rates from Building Materials	
H.T. Kim, T.W. Kim, W.H. Hong, K.G. Lee and K.K. Min	369
Properties on the Freeze-Thaw Resistance of High Performance Concrete Using Fibers and Mineral Admixtures	
S.J. Lee	375
Free Vibration Analysis for Tapered Cross-Section Steel-Concrete Composite Material Beam	
J. Xia, Z.Q. Shen and K. Liu	380
Powder Characteristics and Cementitious Properties of Steel Slag Used as Supplementary Cementitious Materials	
Z.B. Li, T.S. He, X.G. Zhao and S.Y. Zhao	384
Cementitious Activity Evaluation of Steel Slag by EDTA-NaOH Solution Extraction Method	
Z.B. Li, T.S. He, X.G. Zhao and S.Y. Zhao	389
Preparation and Research on a Kind of Magnetorheological Grease Material Used Anti-Collision System	
J. Ge, C. Jiang, G.J. Yu, B. Su and T. Sun	395
The Concentration of Di(2-Ethylhexyl) Phthalate on a Flooring Surface in Dwelling House	
H.T. Kim, S.I. Tanabe, T.W. Kim and W.H. Hong	400
Study on Fracture Properties of Mortar Based on Electronic Speckle Pattern Interferometry	
H.N. Chen, R.K.L. Su and J.J. Chen	405
Crack Control in Reinforced Concrete Liquid Retaining Structures	
J. Navrátil and R. Čajka	410