

Table of Contents

Preface

Chapter 1: Materials Processing Technologies

Deformation Characteristics of the Sheet Metal in the Roll Gap for the Continuous Roll Forming Process M. Wang, S.C. Yang and G.L. Lu	3
Influence of Process Parameters on Surface Roughness and Wettability of Aluminum-Matrix Materials W.X. Du, L. Zhan, F. Liu, B.Z. Shan and W. Hwang	8
Experimental Research on Hydrogen Resistance Performance of Different Microstructure W.B. Li and J. Wang	13
Numerical Studies for the Effects of Viscoelastic Constitutive Parameters on the Extrudate Swell of Plastic Micro-Tubes Z. Ren, X.Y. Huang and Z.H. Xiong	19
Plasma Simulation for the Anode Layer Ionization Source Using in the Material Modification Process J.W. Wang, Y.C. Zhang and L. Zhang	24
Study on the Material Removal Rate of Nano-ZrO₂ Ceramics under Ultrasonic Vibration Assisted Diamond Fly-Cutting Y.Y. Yan, Y.F. Lv and J.L. Liu	30

Chapter 2: Mechanical Properties of Materials and Solid Mechanics

The Effect of Lattice Orientation on the Film Hole Deformation of Nickel-Based Single Crystal Plate Specimen G. Cao, Y.Q. Yang, Z.X. Wen and Z.F. Yue	39
Mechanical Properties Evaluation Method on Welded Joints of X70 Pipeline Steel Based on Vickers Hardness and Indentation Test Y.Y. Wang, J. Wang, X.Y. Li and X.L. Gao	44
Multi-Scale Study of Tensile Mechanical Properties of Carbon Nanotube Film under Lateral Loading Q. Li, P. Gao and W. Qiu	49

Chapter 3: Functional Materials and Composites

Research on the Repair Performance of Self-Healing Aluminum Material Based on the Low Melting Point Slicker Solder Alloy W. Sun, R.X. Yan, L.C. Sun, Z. Li, G.Q. Lang, Q. Zhang and Y. Wang	57
Cold Sprayed Additive Manufacturing of SiC/Al Metal Matrix Composite: Synthesis, Microstructure, Heat Treatment and Tensile Properties L. Gyansah, N.H. Tariq, J.R. Tang, X. Qiu, J.Z. Gao, J.Q. Wang and T.Y. Xiong	62
One-Pot Synthesis of Iron Oxides-Doped Carbon Microspheres Composites X.H. Guo, H. Yang and G.B. Guo	76
Effects of Al₂O₃ Additive on Manganese Phosphate Conversion Coating of Carbon Steel Y.T. Noh, Y.M. Byoun, H.Y. Kim, H.S. Kang, J.K. Park, S.G. Seo and C.H. Lee	81
Influence of Cold Spraying Process on the Bonding Strength of Ni-Al₂O₃-Zn Coating X.G. Meng, X.Y. Li and L. Sun	91
Absorption Rate Evaluation of Fabric-Foam-Fabric Plied Material C.W. Kan, C.M.C. Ko, P. Jaroensappayanant, M. Pangsaai and R. Mongkholrattanasit	97
Preparation and Experimental Study of Graphite Material for Water Lubricated Thrust Bearing of Nuclear Main Pump J.L. Wang, C. Zhang, Y.L. Wang, D.P. Wang, Q. Jia, Y.H. Cui and X.Y. Yuan	102

Chapter 4: Chemical Engineering

Preparation of Nano-TiO₂ Modified Temperature-Responsive Chromatographic Materials for Enrichment of Phosphopeptides

X. Pang, J.S. Feng, D. Wang, B. Li, X.Q. Li, Y.L. Deng and R.J. Dai 109

One-Pot Preparation of Carbon Immobilized Nano-Metal Catalysts from Biomass

H. Yang, X.H. Guo, C.H. Yuan, J.Y. Liu and W.X. He 119

Adsorption of Heavy Metals Using γ -PGA Produced by *Bacillus pumilus*

W.F. Liu, X.W. Li, W.B. Dong, L. Bo, Y.M. Zhu and L.H. Zhang 124

Chapter 5: Building Materials

The Preparation and Performance of the Cement-Based Concrete 3D Printing Materials

Y. Zhu, C.K. Wen, G.D. Xu, D. Liu and J. Chen 131

Properties of Low Water/Cement Ratio and High Compressive Strength Pervious Concrete

M.C. Chi, J.J. Chang and W.C. Yeih 136