

Table of Contents

Preface

Chapter 1: Structural Steel and Alloys

Zn-Assisted Liquid Metal Embrittlement of 980MPa Grade Advanced High Strength Steels Y.H. Jiang, J. Zhou, C. Fu and X. Bai	3
Microstructures and Properties of Friction Stir Welded Al-Cu Lap Joints W.J. Liu, W.Q. Wang and F. Jiang	9
Numerical Simulations of Projectile Nose Angle Effect in Ballistic Perforation of Double-Layered Steel Plates W.H. Sun, G.L. Ju, X.T. Huang and J.W. Pan	15
Research on Gas Nitriding Technology Catalyzed by Rare Earth for 40CrNiMoA Alloy Steel W.J. Li and X.X. Li	21
Effect of Mold Temperature on Surface Segregation of Continuous Unidirectional Solidified Cu-Ag Alloy J.H. Luo, L.J. Xiang, X. Gan, S. Han, A.L. Deng and L.L. Zhang	26
Effect of Pipe Length on the Temperature Field for 9% Cr Heat-Resistant Steel Pipes in Local Post Weld Heat Treatment X. Wang, J. Zhong and H. Ke	32
Pitting Corrosion Failure Analysis of a Produced Oil/Water Fluid Pipeline Y. Ma, Z.L. Guo, J.C. Qiao and H.T. Bai	39

Chapter 2: Nanomaterials and Composites

Morphology and Properties of Poly(Lactic Acid)/Ethylene-Octene Copolymer Nanocomposites S. Wacharawichanan, A. Sriwattana, K. Yaisoon and M. Phankokkruad	47
Finite Element Modelling and Multi-Objective Optimization of Composite Submarine Pressure Hull Subjected to Hydrostatic Pressure E. Fathallah	53
Modification Effect of Nanometre Zirconia on Ca-PSZ Ceramics L. Zhao, S. Yao and J. Du	59
Simulation and Analysis on Fiber Reinforced Rubber Matrix Sealing Composite Based on Cohesive Zone Model X.M. Yu, B. Zhang, J.M. Shen, Y. Li and S.S. Liu	65
Monitoring of Multidirectional and Cure-Induced Strain in CFRP Laminates Using FBG Sensors C.B. Jiang, L.H. Zhan, X.B. Yang, X.P. Chen, Z.J. Lin and C.L. Guan	72
Experimental Study on Forming Quality of Hat-Shaped Component Based on Combined Mandrel Pressurization Method Z.J. Lin, L.H. Zhan, Y.B. Li, T.F. Chang, F. Deng, C.B. Jiang, G.M. Liu and X.H. Kang	80
Crash Analysis of UAV Hybrid Composite Fuselage Structure under Different Impact Conditions M. Zahran and M. Abdelwahab	88
Comparison between the Use of Aluminum and Composites in the Design of a Wing-Spar of an Airplane M. Khames, A. Embaby and A. Agha	95
Synthetic Method for Preparing High-Performance Europium-Doped Up-Conversion Ceramic Material Precursor Z. Zhang, Y.W. Chen, X.L. Lv, P. Zhang, G.Z. Cui, X.Z. Wang and H. Liu	101

Chapter 3: Functional Materials

Fretting Characteristics and Environmental Reliability of Au-Sn Contact Pairs X.Y. Lin, H.T. Hao and M. Xie	115
Preparation and Characterization of High-Voltage Cathode Material LiNi_{0.5}Mn_{1.5}O₄ for Lithium Ion Batteries Z. Chen, Q.F. Chen, S.N. Zhang, G.D. Xu, M.Y. Lin, M.M. Wang, S. Zhi, Y.S. Chen, J. Zou and S.W. Xing	121
Effects of Electromagnetic Fields on the Quantum Yield of Free Radicals in Cryptochrome Y.L. Chen, D.Y. Geng and C.F. Chen	127
Dynamic Variation of Storage Characteristics and Molecular Structure of Natural Rubber F. Zhao, J. Guan, W.N. Bai and S.Q. Liao	133

Chapter 4: Materials Chemistry

Preparation and Cross-Linking Properties of VAc/DAAM Copolymer Emulsion Y. Liu, Y.X. Zang, X.H. Wang and L.M. Dong	141
Synthesis and Foaming Performance of Lauramidopropyl Betaine Derivate Surfactants B. Yang, B. Yun, X. Lu, Q.N. Liu, Z.F. Song, S.J. Chen and G. Chen	147
Synthesis of New Surfactants from Lauramidopropyl Betaine and Surface Activity Evaluation Q.N. Liu, A.G. Yang, S. Peng, R.J. Zhang, J.L. Li and G. Chen	153
Preparation of New Carbonized Polymer Dots with Folic Acid and Detection of Copper Ion K.B. Pan, J. An, B.Z. Yuan, X.D. Lv, X.H. Huang, B. Yang and Z.C. Cui	160
Study and Evaluation of Changqing Crude Oil Antiwaxing Agent Q.M. Luo, J. Yang, L.J. She, W.J. Wan, Y. Ma, X.F. Gu and G. Chen	166
Preparation, Characterization and Application on Catalytic Removal of NOx for Ni/Cu/Fe Mixed Metal Oxides H.B. Liu and Z.Y. Huang	172
Study on Properties of a Novel Flame Retardant Epoxy Curing Agent Y.L. Peng, C. Zhang and N.A. Zhuo	179
Synthesis and Characterization of a New Phosphorus-Containing Curing Agent PPDTA Y.L. Peng, N.A. Zhuo and C. Zhang	185
One-Pot Preparation of Silica Fibers from Rice Straw for Efficiency Removal of Heavy Metal Ions S.Z. Li, Y. Li, K. Zhang and L. Yao	191
Facile Fabrication of N-Methyl-D-Glucamine Grafted HDPE Particle as Adsorbent for Boron Removal from Aqueous Solution J.F. Du, Z. Dong, X. Yang and L. Zhao	198

Chapter 5: Materials and Technologies in Construction

Influence of Cementitious Capillary Crystalline Waterproofing Material on the Water Impermeability and Microstructure of Concrete Y.T. Zhang, L. Zuo, J.C. Yang, W.X. Zhao and X.X. Zeng	209
Analysis on Live Load Distribution Factors of Widened Hollow Core Slab Bridges L.F. Zhang, Y. Wang, Y.G. Lei and Y. Chang	215
A Review on the Modification of Geopolymer with Inorganic Mineral Materials Y. Huang	223