

Table of Contents

Preface

Chapter 1: Metallurgical and Metal Processing Technologies

Effect of Sr and Ni Addition on Microstructure, Tensile Behavior and Electrical Conductivity of Squeeze Cast Al-6Si-3Cu Al Alloy Y.X. Li, Y.T. Fu, A. Hu, X.Y. Nie and H. Hu	3
Enlarged Zn Content Improves Fatigue Crack Propagation Resistance of Two Al-Zn-Mg-Cu Alloys with Multiple Aging Tempers K. Wen, B.Q. Xiong, W.C. Ren, Y.Z. Tong and K. Zhu	15
Study of Quench Sensitivity and Microstructure Evolution of Al-Mg-Si Alloy Sheets G.J. Gao, B.Q. Xiong and L.Z. Yan	23
Effect of the Inhomogeneity of Material Properties on the Quenching and Pre-Stretching Residual Stress in Aluminum Alloy H.W. Ran, Y.N. Li, N. Fan, H.T. Lin and H. Zhou	33
Integrated Design and Manufacturing of Aviation Aluminum Alloy Support Based on SLM Technology D.W. Ma and W.B. Zhang	39
Effects of Deformation Rate on the Mechanical Properties of an Industrial Al-Zn-Mg-Cu Alloy M.Y. Yu, Y.A. Zhang, G.H. Shi, H.W. Yan and H.W. Liu	45
Effect of Fe-Rich Phases on Fracture Toughness of High Strength Al-Zn-Mg-Cu Alloy R.S. Gao, Z.H. Li, Y.N. Li, W.C. Ren and F.C. Wang	51
Effect of Cu Content on the Microstructures of As-Cast and Homogenized Al-Cu-Mg-Ag Alloys Q.L. Liu, X.W. Li, Z.H. Li, L.F. Chen and H.T. Lin	59
Effect of Zn/Mg Ratio on Microstructure Evolution of Al-Zn-Mg-Cu Alloys during Homogenization H. Yin, Z.H. Li, L.Z. Yan and H.W. Liu	65
Second Phase Dissolution Evolution of an As-Cast Al-4.0Cu-1.0Li-0.4Mg-0.3Ag-0.1Zr Alloy during Multiple Homogenization Processes B. Lin, K. Wen, Y.A. Zhang, Z.G. Hu and H.Q. Wu	75
Regulate and Control Grain Structure Characteristics and Mechanical Properties Control of Al-Zn-Mg-Cu Alloy G.H. Shi, H.W. Yan, M.Y. Yu, K. Zhu and G.J. Gao	85
Effect of Pre-Deformation Degree on the Mechanical Properties and Microstructural Evolution of a Novel Al-Cu-Li Alloy P.C. Chen, X.W. Li, Y. Yao and W. You	93
Metal Injection Molding Using Gas-Assisted Technology for Optimizing Density Uniformity and Part Weight Reduction S.C. Chen, M.H. Ou Yang, C.T. Feng, T.J. Hsu, Y.H. Ting and C.W. Chang	101
Simulation Research on Cold Extrusion Strengthening and Reaming of 7050 Aluminum Alloy Plate Hole H.Q. Lv, Z.Y. Fan, X. Xu and X. Huang	109

Chapter 2: Functional Materials

Impurity Characterization by LA-ICP-MS in Terbium Metal after Solid State Electrotransport Purification X.W. Zhang, R.Y. Miao, J.M. Zhong, Z.A. Li, D.G. Wu, D.H. Chen and Z.Q. Wang	119
Spectroscopic Properties and Micro-Structure for Promising Solar Cell Application of Ruthenium-Diphenyl Carbazide (RuDPC) Complex M. Hafez, S. El-Sayed and S.A. Sayed	129

Chapter 3: Wastewater Treatment

Advanced Wastewater Treatment by Using Entrapped nZVI into Alginate (Ag) Biopolymer: Adsorption Isotherm, Kinetic Models, and Statistical Analysis A.S. Mahmoud, M.S. Mahmoud, N. Yousri and M.K. Mostafa	147
Thermodynamic Equilibrium Kinetics of Sewage Sludge Ash Pellets for the Removal of Methylene Blue (MB) from Aqueous Solutions R.A. Sary El-Deen, N.Y. Mahmoud and A.S. Mahmoud	161
Reduction of Biological Contaminants from Municipal Wastewater by Encapsulated nZVI in Alginate (Ag) Polymer: Reduction Mechanism with Artificial Intelligence Approach M.M. Elshfai, R.G. Hassan and A.S. Mahmoud	173
Treatment of Chromium from Tannery Wastewater Using Nano-Bio Polymer Complex M.S. Mahmoud and A.S. Mahmoud	191

Chapter 4: Materials and Technologies in Construction

Using Glass Wastes as Partial Replacement of Coarse Aggregates in Concrete A.F. Oan and A. Alrefaei	207
Improving the Performance of Cement Mortar Using Granite Powder and Nano-Silica B.A.M.A. El Rahman	217
Experimental Study of the Effect of Partial Replacement of Cement with Glass Powder on Concrete Properties A.G. Elmikass, M.H. Makhoulf, T.S. Mostafa and G.A. Hamdy	231
Evaluating the Use of Waste Materials in Building Envelopes for Energy Efficiency: A Theoretical and Empirical Study C.K. Hanna, A.M. Mohammad Ali and S.S.M. Shebl	239
Properties and Microstructure of High Strength Concrete Incorporating Different Supplementary Cementitious Materials M. Amin, N. Abd El-Aziz, I.S. Agwa and K. Abu El-Hassan	247
Thermal and Mechanical Properties of Mortar Incorporated with Phase Change Materials (PCMs) A.M. Heniegal, O.M.O. Ibrahim, N.B. Frahat and M. Amin	259
Experimental Study of RC Column Strength Restoration after Core Drilling Using Different Strengthening Techniques T.H.K. Elafandy, S.A. Salem, L.M. Abd el-Hafez and M.A. Eid	271
Investigation of Tensile Lap-Splice Hybrid Steel Bars Used in RC Beams under Flexure M. Gnedi, M. Helmy and M. Hatem	283