

Table of Contents

Preface

Chapter 1: Steel and Alloys

| | |
|---|----|
| Effect of Zn/Mg Ratio on Second Phase Dissolution during Solution Treatment of Al-Zn-Mg-Cu Alloys | |
| H. Yin, Z.H. Li, K. Wen, Q.H. Wen and Y.N. Li | 3 |
| Second Phase Dissolution Influenced by Simultaneously Enhanced Mg, Cu Contents during Homogenization of As-cast Al-Zn-Mg-Cu Alloys | |
| W.C. Ren, K. Wen, Y.A. Zhang, H.L. Liu and T.Y. Zhang | 11 |
| Second Phase Dissolution and Grain Characteristics of As-Cast Al-Cu-Li Alloys with Different Mg Contents during Homogenization | |
| P.C. Chen, X.W. Li, Y. Yao, Z.A. Wang and G. Shi | 20 |
| Exploration of Phase Dissolution during Solution Treatment for a New Al-3.86Cu-0.89Li-0.38Mg-0.28Ag Alloy | |
| T. Wang, B.Q. Xiong, B. Lin, Z.G. Hu and X.W. Li | 30 |
| Interrelationship of Fracture Mechanism and Microstructure of TC18 Titanium Alloy | |
| X. Ran, Z. Wang, C.C. Liu, P.J. Li and Z.G. Lv | 38 |
| Microstructure Evolution and Performance of Laser-Remelted Ti-6Al-4V Alloy | |
| K.K. Hu, S.C. Wang, W. Gao, H.Y. Yu and D.B. Sun | 46 |
| Research Progress on Properties and Application of Titanium Alloy Oil Country Tubular Goods | |
| L.J. Zhu, C. Feng, K. Zhang, F.F. Zhang, W.W. Song, P. Wang and N. Ji | 56 |
| Effect of Pre-Stretching and Under-Aging Treatment on Fatigue Crack Resistance of Al-Cu-Mg Alloy Casing Pipe | |
| H.T. Liu, M.F. Zhao, F. Hu, L.J. Zhu, Z.Y. Liu, X.F. Bai and L. He | 67 |
| Effect of Secondary Treatment on the Exothermic and Tensile Properties of Vacuum Hot-Pressed Ni/Al Energetic Structural Composites | |
| Q.Y. Ding, D. Ma, Y. Tang, X. Li, C.Q. Ma and P. Shen | 74 |
| Laser Cladding of Titanium Alloy Coating on Low Carbon Steel via Cu Interlayer | |
| W. Gao, S.C. Wang, J. Si, K.K. Hu, H.Y. Yu and D.B. Sun | 80 |
| Corrosion Behavior of 3Cr Steel in Simulated Oilfield CO₂ Environment | |
| N. Ji, X.R. Kuang, K.Q. Ge, P. Wang, Y. Long and C. Feng | 91 |

Chapter 2: Bio-Based Materials and Biorefining Technologies

| | |
|---|-----|
| Preliminary Study of Chemically Pretreated Densification of Juniper Wood for Use in Bone Implants | |
| L. Andze, M. Andzs, M. Skute, V. Nefjodov, M. Kapickis and R. Tupciauskas | 101 |
| A Study on Waste Paper Reinforced Recycled Polypropylene Biocomposite | |
| J. Jaunslavietis, J. Ozolins, M. Kalnins, G. Shulga, B. Neiberte, A. Verovkins and T. Betkers | 109 |
| Rheological, Thermal and Mechanical Properties of Wood Plastic Composites (WPCs) Based on Virgin and Recycled Polypropylenes and Birch Plywood Waste | |
| K. Kalnins, J. Kajaks and J. Matvejs | 117 |
| Hemp Shives Mycelium Composites - An Alternative Material for Traditionally Used Plastic Packaging | |
| G.D. Loris, I. Irbe, M. Skute, I. Filipova, L. Andze and A. Verovkins | 126 |
| Potential of some Latvian Industrial Crops Residuals for Conversion to Bio-Based Thermal Insulation Material | |
| A. Bērziņš, R. Tupciauskas, M. Andzs and G. Pavlovichs | 139 |
| Characterization and Evaluation of Water-Based Ecological Paint for Protection of Wood Materials Coated Using Dipping Technique | |
| E. Sansonetti, D. Cīrule, E. Kuka, B. Andersons, I. Andersone and M. Danieks | 147 |

| | |
|--|-----|
| The Research Landscape of Biorefinery: A Scientometrics Viewpoint | 155 |
| A. Kokorevič | |
| Suberinic Acid Isolation from Birch Outer Bark and their Characterization | 166 |
| D. Godina, R. Makars, A. Abolins, A. Paze, M. Kirpluks and J. Rizhikovs | |
| Potential of Crude Tall Oil Polyols for Rigid Polyurethane Foam Production and their Comparison with Tall Oil Fatty Acids Polyols | 174 |
| E. Kauliņa, A. Abolins, A. Fridrihsone and M. Kirpluks | |
| Study of Catalysts for Suberinic Acid-Based Adhesive Polymerization | 182 |
| R. Makars, J. Rizhikovs and A. Paze | |
| Constraint Handling and Flow Control in Stirred Tank Bioreactors with Magnetically Coupled Impellers | 189 |
| A. Buss, A. Suleiko, N. Jekabsons, J. Vanags and D. Loca | |
| Cellulose Modification with Maleic Anhydride | 197 |
| V. Fridrihsone, J. Zoldners, M. Skute, L. Andze and I. Filipova | |
| Study of a Novel Biorefining Method for Obtaining 2-Furaldehyde, Acetic Acid and Pulp from Birch Wood | 204 |
| M. Puke, D. Godina, P. Brazdausks and J. Rizhikovs | |

Chapter 3: Progressive Building Materials and Technologies

| | |
|---|-----|
| Effect of Modified Starch on Properties of Clay Composites | 215 |
| Y. Trambitski, O. Kizinievič and V. Kizinievič | |
| Preparation of Inorganic Foam Glass-Ceramic with Utilization of Waste Diatomite as a Raw Material | 222 |
| M. Nguyen, M. Sedlačík, R. Sokolař and T. Opravil | |
| Influence of Microstructure on Physico-Mechanical Properties and Corrosion Resistance of Refractory Forsterite-Spinel Ceramics | 229 |
| M. Nguyen and R. Sokolař | |
| Foam Glass Preparation from Waste Diatomite: Assessment of High Temperature Behaviour and Foaming Ability | 235 |
| M. Sedlačík, M. Nguyen, T. Opravil and R. Sokolař | |
| Corrosion Properties of Castables with Various Calcium Oxide Content | 241 |
| D. Zemánek and L. Nevřivová | |
| ^{29}Si NMR Investigation of the Effect of Acetic and Oxalic Acids on Portland-Limestone Cement Hydration | 247 |
| A.S. Mazur, P.M. Tolstoy and K. Sotiriadis | |