

TABLE OF CONTENTS

Aluminum Alloys: Fabrication, Characterization and Applications

Preface	xi
Editors	xii

Aluminum Alloys: Fabrication, Characterization and Applications

Development and Applications

Development of Al-30%B4C Metal Matrix Composites for Neutron Absorber Material.....	3
<i>X.-Grant Chen, and Robert Hark</i>	
Enabling Environmentally-Informed Materials Selection Decisions: Robustness of Early Stage Life-Cycle Assessment.....	11
<i>Anna Allen, Subodh Das, Frank Field, Jeremy Gregory, and Randolph Kirchain</i>	
Effects of Heat Treating Aluminum Alloy 6061 in 8 T and 20 T Magnetic Fields	19
<i>Samuel Adedokun, Akin Fashanu, and Bayo Ogunmola</i>	
The Correlation between Deformation Conditions and Peripheral Coarse Grain Structure in Extrusion of AA7020 Aluminum Alloy	25
<i>Ali Eivani, Hany Ahmed, Jie Zhou, and Jurek Duszczyk</i>	
An Investigation of the Hot Deformation Behavior of AA7020 and AA7475 Aluminum Alloys.....	33
<i>Hany Ahmed, Ali Eivani, Jie Zhou, and Jurek Duszczyk</i>	
Influence of Stress Macroconcentrators on the Strain Localization in Al6061/Al2O3 Composites.....	41
<i>Y. Deryugin, V. Panin, V. Suvorov, Galina Lasko, and S. Schmauder</i>	

Processing and Properties

Press Formability of Twin Roll Cast (TRC) Aluminum Alloys	51
<i>SooHo Kim, and Anil K. Sachdev</i>	
Forging of Long Flat Pieces of Aluminium with a Precise Mass Distribution Operation.....	61
<i>Malte Stonis, Michael Lueke, and Rouven Nickel</i>	
Hemispherical Bubbles Growth on Electrochemically Charged Aluminum with Hydrogen	67
<i>Paul Rozenak</i>	
Ablation Casting	73
<i>John R. Grassi, John Campbell, M. Hartlieb, and F. Major</i>	
Strength-Toughness Optimization Scenarios through Interrupted Ageing in AA6061 and AA2024.....	79
<i>Doty Risanti, Pedro Rivera-Diaz-del-Castillo, and Sybrand van der Zwaag</i>	
Preparation of Al-Sr Alloys with High Concentration by Molten Salt Electrolysis.....	85
<i>Jidong Li, Mingjie Zhang, Tingan Zhang, and Dan Li</i>	
Preparation of Al-Li Alloys by Molten Salts Electrolysis	91
<i>Jidong Li, Mingjie Zhang, Tingan Zhang, and Dan Li</i>	
Preparation of Al-Sc Alloys by Molten Salts Electrolysis.....	99
<i>XiuJing Zhai, Mingjie Zhang, Junfu Li, and Yan Fu</i>	

Modeling

Aluminum Plate Hot Rolling Process Modeling.....	107
<i>Zhengdong Long, Yansheng Liu, Randall Bowers, Weimin Yin, and Shridas Ningileri</i>	
Effect of Asymmetric Rolling on Texture and Anisotropy of AA6016 Alloy for Automotive Applications.....	113
<i>J. Sidor, L. Zhuang, M. van der Winden, and L. Kestens</i>	

The Residual Stress Investigation in Al Using β -Particles Penetration Method.....	119
<i>Behrooz Salehpour, H. Pirhoseinloo, and M. Taheri Hashjin</i>	
Numerical Simulations of a New Local Hot Forming Process for Making Imprints in Aluminium Extrusions	125
<i>Hallvard Fjær, and Børge Bjørneklett</i>	
Simulation of PLC-Effects in Al6061/Al2O3 Alloys	131
<i>Galina Lasko, Ye. Ye. Deryugin, and S. Schmauder</i>	

Alloy Characterization

Formation of Special Textures by Precipitation in Cast AA5083 and AA3004 Aluminum Alloys	141
<i>Qiang Zeng, Xiyu Wen, and Tony Zhai</i>	
Effect of Alloying Elements on the Segregation of Complex Phases in A356 Alloy Adding Mg, Cu, Ni and Sr as Modifier, Using Thermal Analysis and Characterization Microstructural.....	147
<i>Aline Hernandez-Garcia, Alejandro García-Hinojosa, F.T. Estéves Alcázar, and Yvan Houbaert</i>	
Effect of Si Distribution on the Fracture Toughness of A356 Aluminum Alloys	155
<i>Yong Nam Kwon, Kyuhong Lee, and Sunghak Lee</i>	
Effect of Weld Tool on Friction Stir Welded AA2219-T87 Properties	163
<i>Joseph Querin, and Judy Schneider</i>	

Corrosion and Protection

The Corrosion Behavior of Al-Zn Alloys in Abakaliki and Port Harcourt Rainwater	171
<i>Ndubuisi Idenyi, C. E. Okeke, and Israel O. Owate</i>	
The Effect of Mn as Fe Corrector on Microstructure and Adhesive Wear of Eutectic Al-Si Piston Alloy.....	177
<i>Dheerendra Dwivedi, Mohit Dhiman, R. Sehgal, and I.K. Bhat</i>	

Comparative Analysis of the Corrosion Susceptibility of Al-Zn Alloys in De-Ionized Water, Rainwater and Seawater	187
<i>Ndubuisi Idenyi, C. E. Okeke, Israel O. Owate, and S. I. Neife</i>	
Influence of Aging Time of Fracture Toughness Mechanisms of Al-Li Alloys	193
<i>Yongxin Wang, Ri Ma, Zheng Chen, and Yanli Lu</i>	
The Effect of Heat Treatment on the Microstructure and Hardness of A356 Aluminum Alloy	199
<i>M. Faraji, and L. Katgerman</i>	

Composites and Foams

Development of High-Strength Hypereutectic Al-Si Alloys by Nano-Refining the Constituent Si Phases	207
<i>Mohammad Shamsuzzoha, Frank R. Juretzko, and Anwarul Haque</i>	
Fabrication of Aluminum Composites with Gradient Cladding Interface by Continuous Casting.....	213
<i>Weiwen Zhang, Datong Zhang, and Yuanyuan Li</i>	
Influence of Magnesium and Silicon Content on Microstructures of In-Situ Mg ₂ Si/Al-Si Composites	219
<i>Qingxiu Jing, and Yinglu Zhu</i>	
Foam Structure and Mechanical Properties of AlCu ₅ Mn Foam.....	225
<i>Zhuokun Cao, Bing Li, Guangchun Yao, and Yihan Liu</i>	
Viscosity Control of Foam Aluminum Melt and Study on Bubble's Stability	231
<i>Li Wei, Li Cao, and Shumei Li</i>	
Effects of Complex Modification and Melt Mixing Treatment on Microstructures in In-Situ Mg ₂ Si/Al-Si Composite	237
<i>Jing Qingxiu, and Huang Xiaodong</i>	
Study on Sound Insulation Performance of Al Foam Sandwich Board	243
<i>Guoyin Zu, Guangchun Yao, and Hong Li</i>	

Effect of Cold-Rolling Bonding Process on Microstructure and Properties of the Sandwich Aluminum Foil for Automobile Heat Exchanger.....	249
<i>Guoyin Zu, Ning Wang, and Jiuming Yu</i>	
Study on Powder Metallurgy Foaming Process of Rolled Precursor.....	255
<i>Guoyin Zu, Guangchun Yao, Hong Li, and Liang Hao</i>	
Author Index.....	261
Subject Index.....	263