

Spring International Conference on Material Sciences and Technology

Selected peer-reviewed extended papers
abstracts of which were presented at the
11th Spring International Conference on
Material Sciences and Technology
(MST-S 2022)

Aggregated Book

Edited by

Dr. Alokesh Pramanik

■
■ *Scientific.Net* ■

Copyright © 2022 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd
Seestrasse 24c
CH-8806 Baech
Switzerland
<https://www.scientific.net>

Volume 6 of
Scientific Books Collection
ISBN 978-3-0357-2679-4

Full text available online at <https://www.scientific.net>

Distributed worldwide by
Trans Tech Publications Ltd
Seestrasse 24c
CH-8806 Baech
Switzerland
Phone: +41 (44) 922 10 22
e-mail: sales@scientific.net

Printed with permission by
Curran Associates Inc. (2023)

CURRAN ASSOCIATES INC.
proceedings
.com

Additional copies of this
publication are available from:

Web: www.proceedings.com/68394.html

Table of Contents

Preface	v
Committee Members, Sponsors	vi
Chapetr 1: Metallurgical Technologies and Materials Processing	
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.....	3
Study of Quench Sensitivity and Microstructure Evolution of Al-Mg-Si Alloy Sheets G.J. Gao, B.Q. Xiong and L.Z. Yan.....	11
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	20
Integrated Design and Manufacturing of Aviation Aluminum Alloy Support Based on SLM Technology D.W. Ma and W.B. Zhang	26
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.....	32
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.....	42
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.....	48
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.....	55
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	61
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	70
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.....	79
Study on the Microstructure and Mechanical Properties of Dynamic Recrystallization of Metastable β Titanium Alloy K.Q. Lv, W.H. Cai, Z. Li, Z.S. Nong and L. Zhang	87

Study on Microstructure and Mechanical Properties of Al_{0.5}TiNbX_{0.5} High-Entropy Alloys	
P. Ren, Z.S. Nong, Z. Li, J.J. Wang and L. Zhang	93
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	99
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	106
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	113
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	120
 Chapter 2: Polymers and Composites	
Technical Analysis and Overview of Recent Advances in Materials Science of Polymers, Polymer Composites and Polymer Nanocomposites	
K.N. Chopra and R. Walia	135
Study on Failure Characteristics of Typical Rivet Connections of C/SiC Composites	
Z.Y. Tan, J.B. Wang, F.F. Meng and C. Xu	141
Study on Clove Oil Microcapsule with Montmorillonite /Polyurethane Hybrid Wall	
H. Wang, D.X. Shao and Y. Bai	147
Study on the Properties of Chemical Foaming Injection Molded Polyolefin/Chitosan Composites	
Y.T. Lin, C.L. Yang, S.S. Hwang and S.M. Chen	153
Tensile Strength and Morphological Behavior of Treated Oil Pam Empty Fruit Bunch Particle Reinforced Polymeric Composite	
D. Wong, M. Anwar, S. Debnath, A. Hamid, S. Izman, A.K. Basak and A. Pramani	159
Surface Improvements on Silver Streak Marks of Injection Molded Moisture Plastics Using Gas Counter Pressure and Plasticizing Optimization	
S.C. Chen, H. Su, T.J. Hsu, C.T. Feng, E.N. Shen and C.W. Chang	170
Effect of Concentration of Electrolyte Solution on the Electrochemical Stability of Ionogel	
S.J. Wei, N.K. Elumalai, S. Debnath, L.C. Ing, M.M. Reddy, N.M. Mubarak and A. Pramanik	177
 Chapter 3: Computational Materials Science	
A Perspective on Metamaterials for the Biomechanics Application: Multi-Material Metamaterial (4M) Structures	
M. Azadi	185
A Material Tolerable State Maximum Probability Timing: The Elements of the Uncertainty Measure Conditional Optimization Doctrine	
A.V. Goncharenko	191

Investigation of Terahertz Wave Propagation along Symmetric Coplanar Stripline on Multilayer Dielectric Substrates	
Z.H. Wang.....	198
Keyword Index	209
Author Index	211