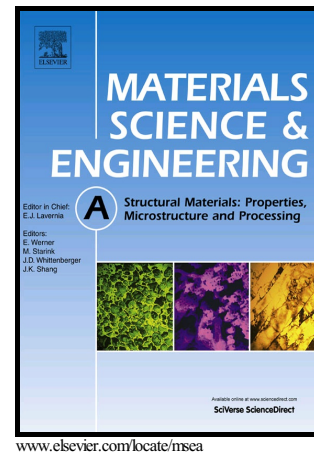


Author's Accepted Manuscript

Microstructural Evolution and Mechanical Strengthening Mechanism of Mg-3Sn-1Mn-1La Alloy after Heat Treatments

Zhanyong Zhao, Peikang Bai, Renguo Guan, Vignesh Murugadoss, Hu Liu, Xiaojing Wang, Zhanhu Guo



PII: S0921-5093(18)31017-7
DOI: <https://doi.org/10.1016/j.msea.2018.07.083>
Reference: MSA36747

To appear in: *Materials Science & Engineering A*

Received date: 3 June 2018
Revised date: 22 July 2018
Accepted date: 23 July 2018

Cite this article as: Zhanyong Zhao, Peikang Bai, Renguo Guan, Vignesh Murugadoss, Hu Liu, Xiaojing Wang and Zhanhu Guo, Microstructural Evolution and Mechanical Strengthening Mechanism of Mg-3Sn-1Mn-1La Alloy after Heat Treatments, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.07.083>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Microstructural Evolution and Mechanical Strengthening Mechanism of Mg-3Sn-1Mn-1La Alloy after Heat Treatments

Zhanyong Zhao¹, Peikang Bai^{1*}, Renguo Guan³, Vignesh Murugadoss^{2,4}, Hu Liu^{2,5},
Xiaojing Wang^{2,6}, Zhanhu Guo^{2*}

¹School of Materials Science and Engineering, North University of China, Taiyuan 030051, China.

²Integrated Composites Laboratory, Department of Chemical and Biomolecular Engineering, University of Tennessee, Knoxville, Tennessee 37996, USA.

³School of Materials Science and Engineering, Northwestern Polytechnical University, Xi'an 710072, China.

⁴Electrochemical Energy Research Lab, Centre for Nanoscience and Technology, Pondicherry University, Puducherry - 605 014, India.

⁵National Engineering Research Center for Advanced Polymer Processing Technology, Zhengzhou University, Zhengzhou 450002, China

⁶School of Material Science and Engineering, Jiangsu University of Science and Technology, Zhenjiang, Jiangsu, 212003, China

baipeikang@nuc.edu.cn (P. Bai)

zguo10@utk.edu (Z. Guo)

*Corresponding Author

Abstract

The Mg-3Sn-1Mn-1La alloy sheets were prepared by a continuous reho-rolling process, and the effects of the solution and aging treatment on the microstructures and mechanical properties of the alloy were studied. The tensile strength and elongation at room temperature and 150 °C of the Mg-3Sn-1Mn-1La alloy sheets were decreased with increasing the solution time. The grain size was increased gradually. The plate-shaped MgSnLa compounds composed of La₅Sn₃, Mg₂Sn and Mg₁₇La₂ phases and Mg₂Sn phase gradually disappeared. At the same time, new irregular MgSnLa compounds were formed in grains. Aging treatment of the alloy was performed after solution treatment. The new spherical MgSnLa compounds composed of La₅Sn₃, Mg₂Sn and Mg₁₇La₂ phase were formed, increased and distributed gradually homogeneously in the matrix

Download English Version:

<https://daneshyari.com/en/article/7971561>

Download Persian Version:

<https://daneshyari.com/article/7971561>

[Daneshyari.com](https://daneshyari.com)