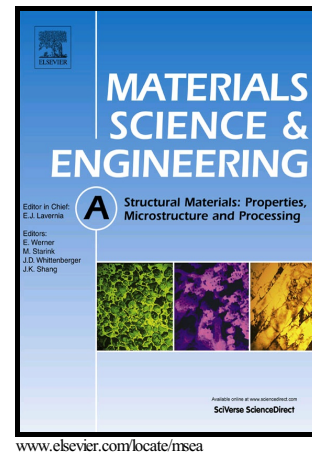


Author's Accepted Manuscript

Nano-scale precipitate evolution and mechanical properties of 7085 aluminum alloy during thermal exposure

Pan Dai, Xian Luo, Yanqing Yang, Zongde Kou, Bin Huang, Chen Wang, Jinxin Zang, Jigang Ru



PII: S0921-5093(18)30758-5
DOI: <https://doi.org/10.1016/j.msea.2018.05.092>
Reference: MSA36530

To appear in: *Materials Science & Engineering A*

Received date: 26 April 2018
Revised date: 23 May 2018
Accepted date: 24 May 2018

Cite this article as: Pan Dai, Xian Luo, Yanqing Yang, Zongde Kou, Bin Huang, Chen Wang, Jinxin Zang and Jigang Ru, Nano-scale precipitate evolution and mechanical properties of 7085 aluminum alloy during thermal exposure, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.05.092>

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.

Nano-scale precipitate evolution and mechanical properties of 7085 aluminum alloy during thermal exposure

Pan Dai¹, Xian Luo^{1*}, Yanqing Yang^{1*}, Zongde Kou¹, Bin Huang¹, Chen Wang^{1,2}, Jinxin Zang³,
Jigang Ru³

¹State Key Laboratory of Solidification Processing, Northwestern Polytechnical University, Xi'an 710072, P.R. China

²College of Material Science and Engineering, Xi'an Shiyou University, Xi'an 710072, P.R. China

³Beijing Institute of Aeronautical Materials, Beijing 100095, P.R. China

*Corresponding authors: luoxian@nwpu.edu.cn, yqyangnw@163.com

Abstract

As a new generation of Al-Zn-Mg-Cu alloy, 7085 aluminum alloy is a promising structural material in the field of aerospace industry. However, research on its thermal stability is still lacking. In the present work, thermal exposure was carried out on the T7452-treated 7085 aluminum alloy under different temperatures (100 °C, 125 °C, 150 °C and 175 °C) for 500 h. Variations of tensile properties and hardness were exhibited. The microstructure, nano-scale precipitates and fracture characteristics of the alloy were investigated using optical microscopy (OM), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The results show that with the increase of exposure temperature, the strength and hardness increase first and then decrease while the elongation and the reduction of area increase continuously as compared to those of the non-thermal exposed alloy. The transformation from η' phase to η phase during thermal exposure occurs continuously during thermal exposure. In addition, as the exposure temperature increases, the

Download English Version:

<https://daneshyari.com/en/article/7971957>

Download Persian Version:

<https://daneshyari.com/article/7971957>

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