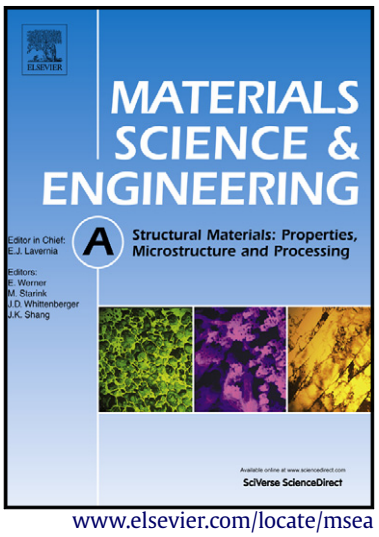
Author's Accepted Manuscript



www.elsevier.com/locate/msea

{10–12} twin variants selection mechanisms during twinning, re-twinning and detwinning

Adrien Chapuis, Yunchang Xin, Xiaojun Zhou, Qing Liu

PII: S0921-5093(14)00814-4
DOI: http://dx.doi.org/10.1016/j.msea.2014.06.088
Reference: MSA31288

To appear in: *Materials Science & Engineering A*

Received date: 29 April 2014
Revised date: 20 June 2014
Accepted date: 23 June 2014

Cite this article as: Adrien Chapuis, Yunchang Xin, Xiaojun Zhou, Qing Liu, {10–12} twin variants selection mechanisms during twinning, re-twinning and detwinning, *Materials Science & Engineering A*, http://dx.doi.org/10.1016/j.msea.2014.06.088

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.

ACCEPTED MANUSCRIPT

{10-12} twin variants selection mechanisms during twinning, re-twinning and detwinning

Adrien Chapuis*, Yunchang Xin, Xiaojun Zhou, Qing Liu

College of Materials Science and Engineering, Chongqing University, 400044 Chongqing, China

Accepted manuscript

Abstract

{10-12} twinning is one of the main deformation mechanisms in Mg-3Al-1Zn at room temperature. Twin variant activation is reported to follow the Schmid law and be activated as a unidirectional slip system, but local stress states are said to favor other twin variants. In a material containing a first generation of {10-12} twins, subsequent deformation can activate re-twinning and detwinning. In the present paper, a multiple twin structure containing two generations of twins was generated by two successive in-plane compressions along two different directions in a rolled plate. The plate was subsequently loaded to activate detwinning. A grain by grain analysis was performed after each compression to identify the twin variants selection mechanisms. During compression and re-compression, twinning was observed to obey the Schmid law well, with preferential activation of the variants with highest Schmid factor. Other variants were observed and predicted by constraint models based on the Schmid law and

Download English Version:

https://daneshyari.com/en/article/7980915

Download Persian Version:

https://daneshyari.com/article/7980915

Daneshyari.com