

# Accepted Manuscript

The *in-situ* mechanical spectroscopy and electric resistance study of WE43 magnesium alloy during aging

Michal Knappek, Peter Minárik, Zuzanka Trojanová, Jiří Kubásek, Michal Hájek, Jana Šmilauerová, Daniel Hofman, Jitka Stráská



PII: S0925-8388(18)30449-3

DOI: [10.1016/j.jallcom.2018.02.019](https://doi.org/10.1016/j.jallcom.2018.02.019)

Reference: JALCOM 44895

To appear in: *Journal of Alloys and Compounds*

Received Date: 30 November 2017

Revised Date: 1 February 2018

Accepted Date: 2 February 2018

Please cite this article as: M. Knappek, P. Minárik, Z. Trojanová, Jiří. Kubásek, M. Hájek, J. Šmilauerová, D. Hofman, J. Stráská, The *in-situ* mechanical spectroscopy and electric resistance study of WE43 magnesium alloy during aging, *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2018.02.019.

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 proof before it is published in its final 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.

# The *in-situ* mechanical spectroscopy and electric resistance study of WE43 magnesium alloy during aging

Michal Knapek<sup>a\*</sup>, Peter Minárik<sup>a</sup>, Zuzanka Trojanová<sup>a</sup>, Jiří Kubásek<sup>b</sup>,  
Michal Hájek<sup>a</sup>, Jana Šmilauerová<sup>a</sup>, Daniel Hofman<sup>a</sup>, Jitka Stráská<sup>a</sup>

<sup>a</sup>Charles University, Faculty of Mathematics and Physics, Ke Karlovu 5, 121 16  
Prague, Czech Republic

<sup>b</sup>University of Chemistry and Technology, Department of Metals and Corrosion  
Engineering, Technická 5, 166 28, Prague, Czech Republic

\*corresponding author: email: [knapek@karlov.mff.cuni.cz](mailto:knapek@karlov.mff.cuni.cz)

## Abstract

The WE43 magnesium alloy was studied by mechanical spectroscopy and electric resistance measurements *in-situ* during aging at 210 and 250 °C. Isothermal aging up to 196 hours at these temperatures promotes only minor increase in the Young's modulus (0.4 – 2.5%). The mechanical spectroscopy results correlate with the resistance measurements and are discussed with respect to the precipitation sequence in this material. Furthermore, during heating up to 450 °C, the mechanical spectroscopy measurements identified an internal friction peak at ~350 °C which is brought about by the relaxation at interfaces between the semicoherent and incoherent precipitates and the matrix. Height of the peak is dependent on the material thermal history.

## Keywords:

Rare earth alloys and compounds; precipitation; elasticity; acoustic properties; phase transitions.

Download English Version:

<https://daneshyari.com/en/article/7993383>

Download Persian Version:

<https://daneshyari.com/article/7993383>

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