

## Accepted Manuscript

Title: Damage behaviour and atomic migration in  $\text{MgAl}_2\text{O}_4$  under an 80 keV scanning focused probe in a STEM

Author: Guo-zhen Zhu Gianluigi A. Botton

PII: S0968-4328(14)00116-4  
DOI: <http://dx.doi.org/doi:10.1016/j.micron.2014.05.010>  
Reference: JMIC 2088

To appear in: *Micron*

Received date: 28-2-2014  
Revised date: 26-5-2014  
Accepted date: 30-5-2014



Please cite this article as: Zhu, G.-z., Botton, G.A., Damage behaviour and atomic migration in  $\text{MgAl}_2\text{O}_4$  under an 80 keV scanning focused probe in a STEM, *Micron* (2014), <http://dx.doi.org/10.1016/j.micron.2014.05.010>

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.

Damage behaviour and atomic migration in  $\text{MgAl}_2\text{O}_4$  under an 80 keV scanning focused  
probe in a STEM

Guo-zhen Zhu and Gianluigi A. Botton

Canadian Centre of Electron Microscopy and Department of Materials Science and  
Engineering, McMaster University, 1280 Main Street West, Hamilton, Ontario L8S 4M1,  
Canada

**Abstract:**

With the dramatic improvement in the spatial resolution of scanning transmission electron microscopes over the past few decades, the tolerance of a specimen to the high-energy electron beam becomes the limiting factor for the quality of images and spectra obtained. Therefore, a deep understanding of the beam irradiation processes is crucial to extend the applications of the electron microscopy. In this paper, we report the structural evolution of a selected oxide,  $\text{MgAl}_2\text{O}_4$ , under an 80 keV focused electron probe so that the beam irradiation process is not dominated by the knock-on mechanism. The formation of peroxy bonds and the assisted atomic migration was studied using imaging and electron energy-loss spectroscopic techniques.

**Introduction:**

The developments in scanning transmission electron microscopy (STEM) have enhanced the capability of imaging individual atoms on a surface (Crewe et al., 1970), atoms within a solid bulk (Voyle et al., 2002) and have made it possible to even probe the bonding

Download English Version:

<https://daneshyari.com/en/article/7986620>

Download Persian Version:

<https://daneshyari.com/article/7986620>

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