

# Accepted Manuscript

Distribution of the microalloying element Cu in B<sub>4</sub>C-reinforced 6061Al composites

Y.T. Zhou, Y.N. Zan, S.J. Zheng, Q.Z. Wang, B.L. Xiao, X.L. Ma, Z.Y. Ma

PII: S0925-8388(17)33012-8

DOI: [10.1016/j.jallcom.2017.08.273](https://doi.org/10.1016/j.jallcom.2017.08.273)

Reference: JALCOM 43030

To appear in: *Journal of Alloys and Compounds*

Received Date: 17 July 2017

Revised Date: 28 August 2017

Accepted Date: 29 August 2017

Please cite this article as: Y.T. Zhou, Y.N. Zan, S.J. Zheng, Q.Z. Wang, B.L. Xiao, X.L. Ma, Z.Y. Ma, Distribution of the microalloying element Cu in B<sub>4</sub>C-reinforced 6061Al composites, *Journal of Alloys and Compounds* (2017), doi: 10.1016/j.jallcom.2017.08.273.

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.



## Distribution of the microalloying element Cu in B<sub>4</sub>C-reinforced 6061Al composites

Y. T. Zhou<sup>1</sup>, Y. N. Zan<sup>1</sup>, S. J. Zheng<sup>1</sup>, Q. Z. Wang<sup>2\*</sup>, B. L. Xiao<sup>1</sup>, X. L. Ma<sup>1,3\*</sup>, Z. Y. Ma<sup>1</sup>

<sup>1</sup> Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, 72 Wenhua Road, 110016 Shenyang, China

<sup>2</sup> CAS Key Laboratory of Nuclear Materials and Safety Assessment, Institute of Metal Research, Chinese Academy of Sciences, 72 Wenhua Road, Shenyang 110016, China

<sup>3</sup> School of Materials Science and Engineering, Lanzhou University of Technology, 730050, Lanzhou, China

\*Corresponding authors. Q.Z.Wang: Tel.: +86 24 23971749. Email: qzhwang@imr.ac.cn

X.L.Ma: Tel.: +86 24 23971845. Email: xlma@imr.ac.cn

### Abstract

Cu is an important microalloying element in Al-Mg-Si (6xxx series) alloys, but its role in B<sub>4</sub>C-reinforced Al-Mg-Si composites is rarely known. In this work, using the state-of-the-art Cs-corrected transmission electron microscopy (TEM), the Cu-related precipitation in a B<sub>4</sub>C/6061 Al composite fabricated at different temperatures is revealed at an atomic level. In the composite hot-pressed at 560 °C, Q phase is the main Cu-contained precipitates. When the pressing temperature increases to 620 °C, the chemical reactions between B<sub>4</sub>C reinforcements and the alloy matrix generate Al<sub>3</sub>BC and MgB<sub>2</sub>. Moreover, Cu is found to segregate at the interfaces between precipitates and the matrix, which is assumed to increase the nucleation of the reaction products.

Download English Version:

<https://daneshyari.com/en/article/5458121>

Download Persian Version:

<https://daneshyari.com/article/5458121>

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