Accepted Manuscript

An empirical law for the elastic moduli of component-segregated W/Cu compounds

X.B. Ye, W.Y. Ding, H.Y. He, R. Ding, J.L. Chen, B.C. Pan

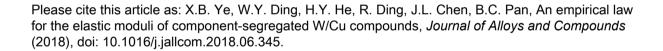
PII: S0925-8388(18)32466-6

DOI: 10.1016/j.jallcom.2018.06.345

Reference: JALCOM 46681

To appear in: Journal of Alloys and Compounds

Received Date: 19 April 2018 Revised Date: 26 June 2018 Accepted Date: 28 June 2018



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.



An Empirical Law for the Elastic Moduli of

Component-Segregated W/Cu Compounds

X. B. Ye a,b, W. Y. Ding c, H. Y. He a, R. Ding d, J. L. Chen d, B. C. Pan a,b,*

^a Key Laboratory of Strongly-Coupled Quantum Matter Physics, Department of Physics, University of

Science and Technology of China, Hefei, Anhui 230026, People's Republic of China.

^b Hefei National Laboratory for Physical Sciences at the Microscale, University of Science and

Technology of China, Hefei, Anhui 230026, People's Republic of China.

^c Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, 230031,

People's Republic of China.

^d Institute of Plasma Physics, Chinese Academy of Sciences, Hefei 230031, People's Republic of

China.

ABSTRACT

The atomic structures and the elastic moduli of W/Cu compounds with different

ratios of Cu-to-W are studied by utilizing tight-binding potential model. It is found

that W/Cu compounds with different Cu-to-W ratios exhibit different microstructural

characteristics, where the component segregation occurs when the compound is

cooled from high temperatures. Furthermore, an empirical law is proposed, by which

the elastic behavior and the ductile properties of W/Cu compounds with various ratios

of Cu-to-W are described very well. Such an empirical law may provide a guide for

experiment to synthesize the W/Cu compounds with the desired mechanical

properties.

Keywords: W/Cu compounds; tight-binding potential model; atomic structure;

empirical law; mechanical property

* Corresponding author:

E-mail address: bcpan@ustc.edu.cn (bcpan).

Download English Version:

https://daneshyari.com/en/article/7990387

Download Persian Version:

https://daneshyari.com/article/7990387

<u>Daneshyari.com</u>