

Accepted Manuscript

Nanoporous tungsten with tailorable microstructure and high thermal stability

Chao Hou, Jie Wang, Haibin Wang, Xuemei Liu, Shuhua Liang, Xiaoyan Song, Zuoren Nie



PII: S0263-4368(18)30318-4
DOI: doi:[10.1016/j.ijrmhm.2018.08.003](https://doi.org/10.1016/j.ijrmhm.2018.08.003)
Reference: RMHM 4769

To appear in: *International Journal of Refractory Metals and Hard Materials*

Received date: 15 May 2018
Revised date: 5 August 2018
Accepted date: 10 August 2018

Please cite this article as: Chao Hou, Jie Wang, Haibin Wang, Xuemei Liu, Shuhua Liang, Xiaoyan Song, Zuoren Nie , Nanoporous tungsten with tailorable microstructure and high thermal stability. *Rmhm* (2018), doi:[10.1016/j.ijrmhm.2018.08.003](https://doi.org/10.1016/j.ijrmhm.2018.08.003)

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.

Nanoporous tungsten with tailorable microstructure and high thermal stability

Chao Hou¹, Jie Wang¹, Haibin Wang¹, Xuemei Liu¹, Shuhua Liang², Xiaoyan Song^{1*} xysong@bjut.edu.cn, Zuoren Nie¹

1. College of Materials Science and Engineering, Key Laboratory of Advanced Functional Materials, Education Ministry of China, Beijing University of Technology, Beijing 100124, P. R. China
2. School of Materials Science and Engineering, Xi'an University of Technology, Xi'an 710048, China

Abstract

Nanoporous tungsten was prepared by a strategy combining mechanical alloying and chemical dealloying at room temperature. The feature size of the nanoporous structure is adjustable by modifying dealloying medium and duration. The formation of nanoporous tungsten is dependent on the surface diffusion of W atoms and their diffusivity in the dealloying medium, which is in a magnitude order of $10^{-20} \text{ m}^2 \text{ s}^{-1}$. The structure of nanoporous tungsten has a high activation energy for surface diffusion, which contributes to its extremely high thermal stability. The nanoporous tungsten may be promising for applications at high temperatures.

Keywords

Nanoporous tungsten

Dealloying

Thermal stability

Surface diffusion

*Corresponding author.

1. Introduction

Download English Version:

<https://daneshyari.com/en/article/7989466>

Download Persian Version:

<https://daneshyari.com/article/7989466>

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