

## Accepted Manuscript

Oxidation properties of self-propagating high temperature synthesized niobium disilicide

Song Binbin, Feng Peizhong, Wang Jianzhong, Ge Yuan, Wu Guangzhi, Wang Xiaohong, Akhtar Farid

PII: S0010-938X(14)00200-5  
DOI: <http://dx.doi.org/10.1016/j.corsci.2014.04.029>  
Reference: CS 5823

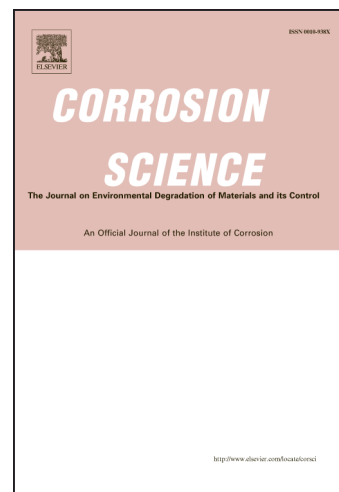
To appear in: *Corrosion Science*

Received Date: 29 December 2013

Accepted Date: 26 April 2014

Please cite this article as: S. Binbin, F. Peizhong, W. Jianzhong, G. Yuan, W. Guangzhi, W. Xiaohong, A. Farid, Oxidation properties of self-propagating high temperature synthesized niobium disilicide, *Corrosion Science* (2014), doi: <http://dx.doi.org/10.1016/j.corsci.2014.04.029>

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.



# Oxidation properties of self-propagating high temperature synthesized niobium disilicide

Song Binbin<sup>1</sup>, Feng Peizhong<sup>1,2\*</sup>, Wang Jianzhong<sup>2</sup>, Ge Yuan<sup>2</sup>, Wu Guangzhi<sup>1</sup>, Wang Xiaohong<sup>1</sup>, Akhtar Farid<sup>3,4</sup>

(1. School of Material Science and Engineering, China University of Mining and Technology, Xuzhou, 221116)

(2. State Key Laboratory of Porous Metal Materials, Northwest Institute for Non-ferrous Metal Research, Xi'an, 710016)

(3. Division of Materials Science, Luleå University of Technology, Luleå 971 87, Luleå, Sweden)

(4. Department of Materials and Environmental Chemistry, Stockholm University, Stockholm 106 91, Sweden)

**Abstract:** NbSi<sub>2</sub> monoliths were prepared by self-propagating high temperature synthesis (SHS) and hot pressing (HP) and their oxidation behavior was investigated at various temperatures (823 K to 1123 K) in air. The combustion mode of SHS reaction was steady state combustion, and the combustion product was single-phase NbSi<sub>2</sub>. Oxidation studies show that the highest mass gain was 0.95675 kg m<sup>-2</sup> at 1023 K. In cyclic oxidation, the oxidation rate was reduced and the mass gain was only 0.15507 kg m<sup>-2</sup>. A dense protective amorphous SiO<sub>2</sub> scale formed at 823 K and 923 K whereas a porous multilayer SiO<sub>2</sub> and  $\alpha/\beta$ -Nb<sub>2</sub>O<sub>5</sub> oxide scales formed at and above 1023 K and spalled off. Pest oxidation of NbSi<sub>2</sub> monoliths was not observed in hot pressed NbSi<sub>2</sub> monoliths.

**Key words:** A. Intermetallics; B. X-ray diffraction; B. SEM; C. Oxidation; C. High temperature corrosion

---

\* Corresponding author. E-mail: fengroad@163.com  
Tel: 086-516-83591938 Fax: 086-516-83591970

Download English Version:

<https://daneshyari.com/en/article/7895897>

Download Persian Version:

<https://daneshyari.com/article/7895897>

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