

## Author's Accepted Manuscript

Thermal shock resistance of continuous carbon fiber reinforced ZrC based ultra-high temperature ceramic composites prepared via Zr-Si alloyed melt infiltration

Yonggang Tong, Wentao Zhu, Shuxin Bai, Yongle Hu, Xinqi Xie, Yang Li



PII: S0921-5093(18)31094-3  
DOI: <https://doi.org/10.1016/j.msea.2018.08.036>  
Reference: MSA36807

To appear in: *Materials Science & Engineering A*

Received date: 24 May 2018  
Revised date: 10 August 2018  
Accepted date: 10 August 2018

Cite this article as: Yonggang Tong, Wentao Zhu, Shuxin Bai, Yongle Hu, Xinqi Xie and Yang Li, Thermal shock resistance of continuous carbon fiber reinforced ZrC based ultra-high temperature ceramic composites prepared via Zr-Si alloyed melt infiltration, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.08.036>

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 galley proof before it is published in its final citable 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.

Thermal shock resistance of continuous carbon fiber reinforced ZrC based ultra-high temperature ceramic composites prepared via Zr-Si alloyed melt infiltration

Yonggang Tong <sup>a, 1</sup>, Wentao Zhu <sup>a</sup>, Shuxin Bai <sup>b</sup>, Yongle Hu <sup>a</sup>, Xinqi Xie <sup>a</sup>, Yang Li <sup>c, 2</sup>

<sup>a</sup> College of Automobile and Mechanical Engineering, Changsha University of Science and Technology, Changsha, China

<sup>b</sup> College of Aerospace Science and Engineering, National University of Defense Technology, Changsha, China

<sup>c</sup> State Key Laboratory of Powder Metallurgy, Central South University, Changsha 410083, China

**Abstract:** Thermal shock resistance of continuous carbon fiber reinforced ZrC based ultra-high temperature ceramic matrix composite (C/C-ZrC) from ultra high temperatures (particularly >1500°C) to the room temperature was evaluated using a novel self-developed equipment with high heating-cooling rates in controllable atmosphere. Residual strength and mass variation of the as-prepared composite under different thermal shock cycles and temperatures were tested to characterize the thermal shock resistance. Flexural strength of the composite slightly decreases initially without obvious weight loss below 1300°C, while it decreases by relatively high values at 1300-1900 °C and then sharply decreases over 1900°C with obvious increase of weight loss. Microstructure of the thermally shocked specimens was examined to reveal the thermal shock damage. Matrix cracking, interfacial debonding and matrix pores were clearly observed, which were the main reasons for the strength

---

<sup>1</sup> Corresponding author. Tel.: +86 731 4573145, E-mail address: tygiaarh419@163.com (YG Tong)

<sup>2</sup> E-mail address: liyang\_csu@126.com (Y Li)

Download English Version:

<https://daneshyari.com/en/article/7971532>

Download Persian Version:

<https://daneshyari.com/article/7971532>

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