

Accepted Manuscript

Microstructure, properties and formation mechanism of SiO₂/SiC nano-coating onto carbon fiber by non-electrode plasma electrolysis

Aiming Bu, Yuping Zhang, Yongfu Zhang, Yonghua Shen, Weiwei Chen, Huanwu Cheng, Lu Wang, Peng Wang, Maoyuan Li, Lin Lu, Yiqiang Hong

PII: S0925-8388(18)33461-3

DOI: [10.1016/j.jallcom.2018.09.221](https://doi.org/10.1016/j.jallcom.2018.09.221)

Reference: JALCOM 47640

To appear in: *Journal of Alloys and Compounds*

Received Date: 16 May 2018

Revised Date: 14 September 2018

Accepted Date: 18 September 2018

Please cite this article as: A. Bu, Y. Zhang, Y. Zhang, Y. Shen, W. Chen, H. Cheng, L. Wang, P. Wang, M. Li, L. Lu, Y. Hong, Microstructure, properties and formation mechanism of SiO₂/SiC nano-coating onto carbon fiber by non-electrode plasma electrolysis, *Journal of Alloys and Compounds* (2018), doi: <https://doi.org/10.1016/j.jallcom.2018.09.221>.

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.



Microstructure, properties and formation mechanism of SiO₂/SiC nano-coating onto carbon fiber by non-electrode plasma electrolysis

Aiming Bu^{1#}, Yuping Zhang^{1#}, Yongfu Zhang¹, Yonghua Shen¹, Weiwei Chen^{1*}, Huanwu Cheng¹, Lu Wang¹, Peng Wang², Maoyuan Li³, Lin Lu³, Yiqiang Hong³

1 Department of Materials Science and Engineering, Beijing Institute of Technology,
Beijing 100081, China

2 Research Institute of Aerospace Special Materials and Processing Technology,
Beijing 100074, China

3 Beijing System Design Institute of Electro-Mechanic Engineering,
Beijing 100854, China

Abstract: Recently we have developed a novel non-electrode plasma electrolysis technique in order to rapidly prepare SiO₂/SiC nano-coating onto carbon fiber. The surface and cross-sectional microstructures of the SiO₂/SiC nano-coating were systematically investigated. The nano-coating was dense and roughly uniform, mainly composed of amorphous SiO₂, where a small amount of SiC was distributed. A superior bonding was observed between the nano-coating and the fiber substrate. The cross-sectional TEM revealed ~80 nm in the thickness for the coating. The SiO₂/SiC nano-coating significantly reduced the oxidation rate with the burn-out temperature increasing from 880°C to 1250°C. It was proposed that the heat evolution, mechanical effect and plasma chemical reactions had a critical effect on the formation of the

*Corresponding author. Tel: 0086-10-68912709ext109.

Email address: wwchen@bit.edu.cn

The authors contributed equally to this work.

Download English Version:

<https://daneshyari.com/en/article/11019978>

Download Persian Version:

<https://daneshyari.com/article/11019978>

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