

Accepted Manuscript

Full Length Article

Effect of carbon nanotubes and octa-aminopropyl polyhedral oligomeric silsesquioxane on the surface behaviors of carbon fibers and mechanical performance of composites

Wenqi Shen, Ruina Ma, An Du, Xiaoyan Cao, Hebin Hu, Zhengbin Wu, Xue Zhao, Yongzhe Fan, Xiaoming Cao

PII: S0169-4332(18)30905-X
DOI: <https://doi.org/10.1016/j.apsusc.2018.03.219>
Reference: APSUSC 38967

To appear in: *Applied Surface Science*

Received Date: 12 February 2018
Revised Date: 20 March 2018
Accepted Date: 26 March 2018

Please cite this article as: W. Shen, R. Ma, A. Du, X. Cao, H. Hu, Z. Wu, X. Zhao, Y. Fan, X. Cao, Effect of carbon nanotubes and octa-aminopropyl polyhedral oligomeric silsesquioxane on the surface behaviors of carbon fibers and mechanical performance of composites, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.03.219>

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.



**Effect of carbon nanotubes and octa-aminopropyl polyhedral oligomeric
silsesquioxane on the surface behaviors of carbon fibers and mechanical
performance of composites**

Wenqi Shen^a, Ruina Ma^a, An Du^a, Xiaoyan Cao^b, Hebin Hu^a, Zhengbin Wu^b, Xue
Zhao^{a*}, Yongzhe Fan^{a*}, Xiaoming Cao^a

^a *School of Materials Science and Engineering, Hebei University of Technology, 29
Guangrong Road, Tianjin 300130, P. R. China. E-mail: zhaoxue@hebut.edu.cn;
fyz@hebut.edu.cn*

^b *Tianjin Chinese Academy of Sciences Institute of Advanced Technology, No.3
Haitai-development Six Road, Xiqing district, Tianjin China.*

ABSTRACT: A kind of carbon fiber/carbon nanotubes/octa-aminopropyl polyhedral oligomeric silsesquioxane (CF/CNTs/POSS for short) reinforcement was prepared by grafting CNTs and OA-POSS to CFs surfaces in order to improve the mechanical properties and interfacial performance. Scanning electron microscopy (SEM), X-ray photoelectron spectroscopy (XPS), and contact angle testing and analysis were applied to characterize the carbon fibers surface. Tensile testing, bending testing and interlayer shear strength (ILSS) testing were employed to analyze the mechanical properties of composites. The experimental results of SEM and XPS indicate that CNTs and OA-POSS are grafted uniformly on fibers surface with chemical bonding of -NH in CNTs and POSS and -COOH on CFs surface. The contact angle test and analysis results show that the surface energy of modified CFs decrease compared with that of the unmodified. Furthermore, the mechanical properties of composites after

Download English Version:

<https://daneshyari.com/en/article/7834313>

Download Persian Version:

<https://daneshyari.com/article/7834313>

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