

Accepted Manuscript

Full Length Article

Preparation of carbon fiber unsaturated sizing agent for enhancing interfacial strength of carbon fiber/vinyl ester resin composite

Weiwei Jiao, Yemeng Cai, Wenbo Liu, Fan Yang, Long Jiang, Weicheng Jiao, Rongguo Wang

PII: S0169-4332(17)33874-6
DOI: <https://doi.org/10.1016/j.apsusc.2017.12.226>
Reference: APSUSC 38096

To appear in: *Applied Surface Science*

Received Date: 11 July 2017
Revised Date: 24 November 2017
Accepted Date: 27 December 2017

Please cite this article as: W. Jiao, Y. Cai, W. Liu, F. Yang, L. Jiang, W. Jiao, R. Wang, Preparation of carbon fiber unsaturated sizing agent for enhancing interfacial strength of carbon fiber/vinyl ester resin composite, *Applied Surface Science* (2017), doi: <https://doi.org/10.1016/j.apsusc.2017.12.226>

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.



Preparation of carbon fiber unsaturated sizing agent for enhancing interfacial strength of carbon fiber/vinyl ester resin composite

Weiwei Jiao ^a, Yemeng Cai ^a, Wenbo Liu ^{a,*}, Fan Yang ^b, Long Jiang ^b, Weicheng Jiao ^b,
Rongguo Wang ^{b,**}

^a School of Materials Science and Engineering, Harbin Institute of Technology, Harbin 150001, China.

^b Center for Composite Materials and Structures, School of Astronautics, Harbin Institute of Technology, Harbin 150080, China.

Corresponding Author.

E-mail addresses: * liuwenbohit@163.com, ** wrg@hit.edu.cn.

ABSTRACT: The practical application of carbon fiber (CF) reinforced vinyl ester resin (VE) composite was hampered seriously by the poor interfacial adhesion property. In this work, a novel unsaturated sizing agent was designed and prepared to improve the interfacial strength by covalently bonding CF with VE matrix. The main component of the sizing agent, N-(4'4'-diaminodiphenyl methane)-2-hydroxypropyl methacrylate (DMHM), was synthesized and confirmed by FTIR and NMR. XPS results of sized carbon fiber (SCF) showed that DMHM has adhered to desized fiber surface and reacted with some active functional groups on the surface. The SCF was characterized by high surface roughness and surface energy (especially the polar component), which means better wettability by VE. As a result, the interface shear strength and interlaminar shear strength of SCF/VE composite were enhanced by 96.56% and 66.07% respectively compared with CF/VE composite, benefited mainly from the strong and tough interphase.

Download English Version:

<https://daneshyari.com/en/article/7835174>

Download Persian Version:

<https://daneshyari.com/article/7835174>

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