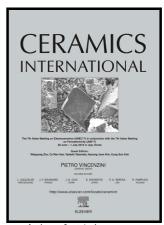
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Effect of co-deposited SiC nanowires and carbon nanotubes on oxidation resistance for SiC-coated C/C composites

Caixia Huo, Lingjun Guo*, Yunyu Li, Changcong Wang, Lei Feng, Ningkun Liu, Yulei Zhang, Kaiyuan Dong, Qiang Song

State Key Laboratory of Solidification Processing, Carbon/Carbon Composites Research Center, Northwestern Polytechnical University, Xi'an 710072, China

*Corresponding author: Tel./Fax: +86 29 8849 4197

E-mail address: guolingjun@nwpu.edu.cn (L. –J. Guo).

Abstract

To protect carbon/carbon composites (C/Cs) against oxidation, SiC coating toughened (SiCNWs) carbon nanotubes SiC nanowires and (CNTs) by nano-reinforcements was prepared on C/Cs by a two-step technique involving electrophoretic co-deposition and reactive melt infiltration. Co-deposited SiCNWs and CNTs with different shapes including straight-line, fusiform, curved and bamboo dispersed uniformly on the surface of C/Cs forming three-dimensional networks, which efficiently refined the SiC grains and meanwhile suppressed the cracking deflection of the coating during the fabrication process. The presence of SiCNWs and CNTs contributed to the formation of continuous glass layer during oxidation, while toughed the coating by introducing toughing methods such as bridging effect, crack deflection and nanowire pull out. Results showed that after oxidation for 45 h at 1773 K, the weight loss percentage of SiC coated specimen was 1.35%, while the weight gain percentage of the SiCNWs/CNTs reinforced SiC coating was 0.03052% due to

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