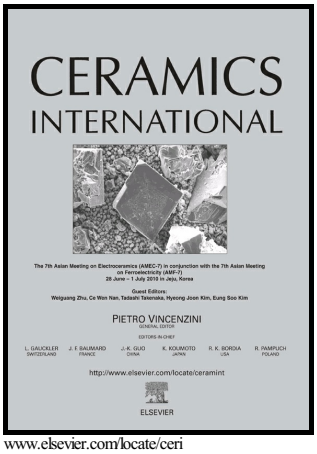

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Abstract

To protect carbon/carbon composites (C/Cs) against oxidation, SiC coating toughened by SiC nanowires (SiCNWs) and carbon nanotubes (CNTs) hybrid 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