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PREPARATION OF CARBON FIBER-REINFORCED SILICON CARBIDE MATRIX COMPOSITE
BY REACTIVE MELT INFILTRATION AT MODEST TEMPERATURE

Abstract

A high performance and low cost C/C-SiC composites were prepared by pressureless reactive infiltration of molten Si_{0.9}Zr_{0.1} alloy into the porous carbon/carbon (C/C) preform at 1500. C/C skeleton with 1.10g/cm³ was densified by pyrolytic carbon using chemical vapour infiltration. After reactive infiltration, the SiC, ZrC and ZrSi₂ phase were formed due to in situ reaction between the pyrolytic carbon and the molten Si_{0.9}Zr_{0.1} alloy. The density of the as-received composite was 2.40 g/cm³. The flexural strength and compress strength were tested. The ablation behavior was investigated in a vertically jetted flowing oxyacetylene torch environment. It had been found that the C/C-SiC composite showed an excellent ablation resistance. The linear recession rate was 0.0090.001 mm/S.