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Carbon Fiber/SiC Composites Modified SiC Nanowires with Improved Strength and Toughness

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Abstract

In this study, C_f/SiC composite was modified with SiC nanowires (SiC_{nws}) grown *in-situ* in SiC matrix. Effects of SiC_{nw} on bending strength and fracture toughness were investigated by comparison with conventional C_f/SiC. Results showed that SiC_{nw} significantly improved both strength and fracture toughness of C_f/SiC. Compared to C_f/SiC, flexural strengths of C_f/SiC-SiC_{nw}/PyC and C_f/SiC-SiC_{nw} composites increased from 363.1MPa to 375MPa and 466.9MPa, respectively. Bending strength and fracture toughness were estimated to 565 MPa and 20.30 MPa·m^{1/2} for C_f/SiC containing SiC_{nw} at high temperature (1000°C), respectively.

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