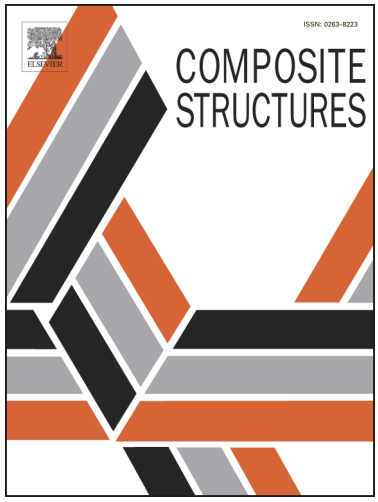

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Mechanical and oxidation properties of C/SiC corrugated lattice core composite sandwich panels

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Abstract

Carbon fiber reinforced silicon carbide (C/SiC) corrugated lattice core composite sandwich structures were fabricated by precursor infiltration and pyrolysis (PIP) with polycarbosilane as the matrix precursor, and effects of high-temperature oxidation on the microstructures and mechanical properties of C/SiC composite sandwich structures were investigated. It was found that the high-temperature oxidation had a great effect on the mechanical properties of C/SiC composite sandwich structures. When the oxidation time was 30 min, the compression strength of C/SiC composite sandwich structures first decreased and then increased with the elevation of oxidation temperature controlled by two competition mechanisms. The compression modulus changed slightly. Different fracture behaviors were shown after oxidation at 1200°C and 1600°C. The compression strength and modulus of C/SiC composite sandwich structures after oxidation at 1600°C decreased with oxidation time. The brittle fracture behavior appeared after 60 min oxidation.

Keywords: C/SiC; precursor infiltration and pyrolysis; lattice sandwich; oxidation;

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