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R-curve behaviour of *in-situ* toughened α-SiC

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R-curves for two *in-situ* toughened α-SiC (SC-A and SC-B), of different microstructures, were characterized using indentation-strength method. Silicon carbide SC-B, with its coarser microstructure and 8 MPa · $m^{1/2}$ toughness, showed higher resistance to crack growth and more damage tolerance than silicon carbide SC-A, with its finer microstructure and 4.5 MPa · $m^{1/2}$ toughness. These results suggest that a coarse microstructure is beneficial to toughening and damage tolerance while a fine microstructure is beneficial to strengthening.

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Microstructure and Mechanical Property of SiCf/SiC Composite with a C interlayer by CVI process

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The interface between fiber and matrix plays a critical role in the performance of CFCCs. The primary function of the interfacial layer is to transfer load to the fiber and provide a weak link for fiber pull-out prior to fiber fracture. Carbon is the most common interfacial material used in SiCf/SiC composites. In this study, the SiCf/SiC composites with a C interlayer were fabricated by CVI process and the microstructure analysis and the evaluation of the mechanical properties were performed. SiC composite with a C interlayer could be obtained around 1000oC. The thickness of C layers changed up to 2000 nm and the density of SiC composite were in the range of 2.2 to 2.65 g/cm3. The 3 point bending strength was varied with the thickness of C interlayers and the density of SiC composites. In our fabrication conditions, the composite with 220 nm of a C interlayer had the maximum bending strength of 675 MPa.