〈P25〉

Microstructure and Mechanical Properties of $SiC-Si_3N_4$ Composites Containing $\beta-Si_3N_4$ Seeds

이 영 일, 김 영 욱, 최 헌 진,* 이 준 근*
서울시립대학교 재료공학과, *한국과학기술연구원 복합기능세라믹스 연구센터

The effect of $\beta-Si_3N_4$ seeds on microstructure and mechanical properties of the hot-pressed $SiC-Si_3N_4$ composites with an oxynitride glass as a sintering additive were investigated A microstructure that consisted of uniformly distributed, elongated $\beta-Si_3N_4$ grains, equiaxed $\beta-SiC$ grains and an amorphous grain-boundary phase was developed The mechanical properties of $SiC-Si_3N_4$ composites increased with increasing the $\beta-Si_3N_4$ seeds content, owing to the reduced defect size and enhanced bridging and crack deflection by elongated $\beta-Si_3N_4$ grains. The flexural strength and fracture toughness of SiC-70 wt% Si_3N_4 composites were 770 MPa and 6 2 MPa·$m^{1/2}$, respectively

〈P26〉

Flaw-Tolerance and R-Curve Behavior of SiC-30 wt% TiC Composites

안현구, 김영욱
서울시립대학교 재료공학과

Flaw tolerance and R-curves for SiC-30 wt% TiC composites and monolithic SiC ceramics were characterized using indentation-strength method Both materials exhibited rising R-curve behavior However, SiC-30 wt% TiC composites with 6 2 MPa · $m^{1/2}$ toughness exhibited better flaw tolerance and more sharply rising R-curve behavior than monolithic SiC ceramics with 5.3 MPa · $m^{1/2}$ toughness Total volume fractions of SiC key grain, which take part in toughening mechanisms such as crack bridging and crack deflection, were 0.607 for monolithic SiC ceramics and 0 614 for SiC-30 wt% TiC composites Thus, superior performance of SiC-TiC composites was attributed to the additional contribution by TiC grains