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섬유단상공정에 의한 폐 SiC 슬러지를 이용하여 다공질 $SiC-Si_3N_4$ 복합재료의 제조

Fabrication of porous $SiC-Si_3N_4$ composite using waste SiC sludge by fibrous monolithic process

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Abstract
The cutting process of silicon wafers with a single crystal structure produced waste SiC sludge. It consists of silicon carbide, silicon and organic lubricant. The waste SiC sludge was purified by washing with organic solvents and purified raw materials were used for the fabrication of porous $SiC-Si_3N_4$ composites by fibrous monolithic process in which carbon was used as a pore forming agent. In burning-out process, carbon was fully removed and was successfully fabricated porous composite. The green bodies containing SiC, Si particles and sintering additives such as Y_2O_3 and AlN were nitrided at 1653K in a flowing of N_2+ 10% H_2 gas mixture. The crystal structure of porous composites existed $\alpha-Si_3N_4$,$\beta-Si_3N_4$ and small amount of residual Si in SiC matrix.

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