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Silicon addition Effect on the Microstructures and Mechanical Properties of Continuously Porous SiC-Si3N4 Composites

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Continuously porous SiC-Si3N4 composites using waste SiC powder (10µm) were fabricated by the fibrous monolithic process Si-powders were added with different proportions (0%, 5%, 10%, 15%, 20%) in the SiC powder to make the raw composite powders 6wt%Y2O3-2wt%Al2O3, Carbon (10-15µm), Ethylene Vinyl Acetate and Stearic acid (CH3(CH2)16COOH) were used as a sintering additives, pore forming agent, binder and lubricant, respectively. In continuously porous SiC-Si3N4 composites, Si3N4 whisker frequently observed on the wall of the pores which like the hairs of the nostrils. In this study, the morphology of the Si3N4 fibres was investigated with the addition of Si powders in different proportions. The relative density and bending strength were also measured depending on the Si addition content in the continuously porous SiC-Si3N4 composites.