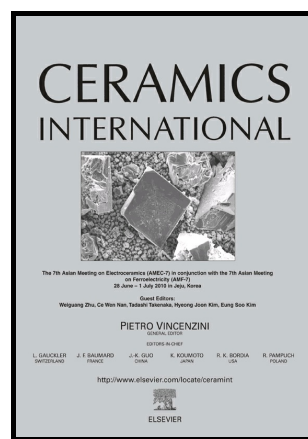


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**Improving the electrical and microwave absorbing properties of Si₃N₄ ceramics
with carbon nanotube fibers**

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Abstract

Carbon nanotube fibers (CNTFs) reinforced Si₃N₄ ceramics has been prepared by incorporating CNTF preforms into ceramic precursor and followed by the sintering process. A SiC interface layer is formed due to the chemical reaction between Si and CNTs, leading to a good bonding between CNTs and Si₃N₄ matrix. Due to the ceramic deposition, the oxidation resistance is increased of 200 °C. Furthermore, the CNTs have well orientation and high-volume distribution (7 wt.%) in the hybrid composites. Obvious improvements of the electrical conductivity (up to 103 S/m) and the microwave absorbing performance (up to 6 dB at 15 GHz) are obtained for the composites containing CNTFs. Our work provides a meaningful way to fabricate multifunctional ceramics possessing high electrical and microwave absorb properties.

Keywords: Carbon nanotubes, Si₃N₄, SiC, Composite

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