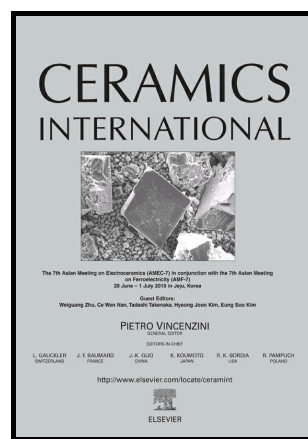


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Experimental characterization and numerical modeling of thermo-mechanical properties of Al-B₄C composites

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Abstract

This paper deals with the fabrication and characterization of thermo-mechanical properties of boron carbide reinforced aluminum matrix composites. The effective elastic moduli and effective coefficients of thermal expansion (CTEs) of 4, 8 and 12 vol% boron carbide reinforced aluminum matrix composites were measured experimentally. Object oriented finite element method (OOF) is used next to determine the effective material properties and the effects of microstructure morphologies, i.e., shape, size and orientation of reinforced particles and the presence of voids is analyzed. Different microstructures are constructed for finite element analysis using scanning electron microscopic images of composites. The results obtained from finite element modeling are compared with the experimental values.

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