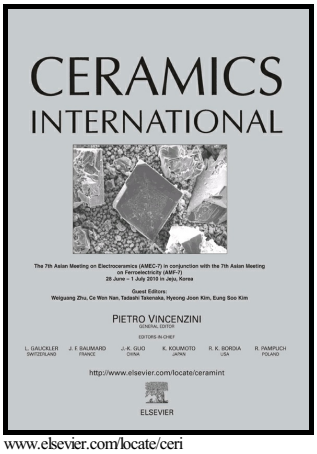

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Abstract

The evaluation of thermal and radiative properties of materials to be used as a hot part of thermal protection systems is a key issue for the design process of the HTC and UHTC components. Ceramic laminates with composition 100 vol%SiC and 80 vol%ZrB_2-20 vol%SiC were prepared by the tape casting technique and pressureless sintered. Thermal properties such as the thermal expansion coefficient, specific heat, thermal diffusivity and conductivity were measured; in addition the total emissivity was evaluated. A comparison of the thermal behavior of these two kinds of laminates is made. Moreover their possible integration in a unique structure is discussed.

Keywords: Thermal protection system; Silicon carbide; Ultra-high temperature ceramics; Thermal properties; Emissivity

1. Introduction

The severe environmental conditions a space vehicle is subjected during the Earth re-entry phase involve very high temperatures, significant heating rates, thermal gradients