

Thermophysical and radiative properties of  
pressureless sintered SiC and ZrB<sub>2</sub>-SiC laminates

Elisa Padovano, Claudio Badini, Konstantina  
Mergia, Jorge Barcena



www.elsevier.com/locate/ceri

PII: S0272-8842(18)31283-5  
DOI: <https://doi.org/10.1016/j.ceramint.2018.05.135>  
Reference: CERI18310

To appear in: *Ceramics International*

Received date: 30 March 2018  
Revised date: 14 May 2018  
Accepted date: 15 May 2018

Cite this article as: Elisa Padovano, Claudio Badini, Konstantina Mergia and Jorge Barcena, Thermophysical and radiative properties of pressureless sintered SiC and ZrB<sub>2</sub>-SiC laminates, *Ceramics International*, <https://doi.org/10.1016/j.ceramint.2018.05.135>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Thermophysical and radiative properties of pressureless sintered SiC and ZrB<sub>2</sub>-SiC laminates.**

Elisa Padovano<sup>a\*</sup>, Claudio Badini<sup>a</sup>, Konstantina Mergia<sup>b</sup>, Jorge Barcena<sup>c</sup>

<sup>a</sup>Politecnico di Torino, Department of Applied Science and Technology, Corso Duca degli Abruzzi, 24, 10129 Torino, Italy

<sup>b</sup>N.C.S.R “Demokritos”, Institute of Nuclear and Radiological Science and Technology, Energy and Safety, Aghia Paraskevi, 15310 Athens, Greece

<sup>c</sup>Tecnalia Research & Innovation, Industry and Transport Division, C/Geldo, Edificio 700, E-48160 Derio – Bizkaia, Spain.

\*Corresponding author. elisa.padovano@polito.it (E. Padovano)

**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<sub>2</sub>-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

Download English Version:

<https://daneshyari.com/en/article/7885996>

Download Persian Version:

<https://daneshyari.com/article/7885996>

[Daneshyari.com](https://daneshyari.com)