The Serbian Society for Ceramic Materials
Institute for Multidisciplinary Research (IMSI), University of Belgrade
Institute of Physics, University of Belgrade
Center of Excellence for the Synthesis, Processing and Characterization of Materials for use in Extreme Conditions "CEXTREME LAB" - Institute of Nuclear Sciences "Vinča", University of Belgrade
Faculty of Mechanical Engineering, University of Belgrade
Center of Excellence for Green Technologies, Institute for Multidisciplinary Research, University of Belgrade
Faculty of Technology and Metallurgy, University of Belgrade

PROGRAMME and the BOOK of ABSTRACTS

6CSCS-2022

6th Conference of the Serbian Society for Ceramic Materials
June 28-29. 2022. Belgrade Serbia

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Branko Matović
Aleksandra Dapčević
Vladimir V. Srdić

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CHARACTERIZATION OF HIGH TEMPERATURE CERAMIC COMPOSITE SEALANTS (CCS) WITH ADDITION OF ALUMOSILICATE BASED WASTE MATERIAL FOR THE POTENTIAL USE IN IT-SOFC

Neda Nišić, Milan Kragović, Andrijana Nedeljković, Irina Kandić, Katarina Nikolić, Jelena Gulicovski, Marija Stojmenović

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In the present paper, possible application of novel concept synthesis method of ceramic composite sealants (CCS) with implementation of alumosilicate-based waste material in intermediate temperature solid oxide fuel cells (IT-SOFC) was investigated. Besides two different basic variants of alumina matrix nanocomposites stabilized by rare earths and carbon materials (CCS-RE and CCS-C), for this purpose two additional sealant compositions with 5 wt.% addition of waste material (CCS-RE5 and CCS-C5) were designated for a comparative study.

The aim of this research was to characterize the waste material, as well as the starting components used for developing ceramic composites through various characterization techniques. Analytical procedures for determining chemical composition with focus on heavy metal content in waste was performed in order to ensure the waste is ecologically acceptable to be used as an additive. Besides, the crystalline phase composition of the raw materials as well as of the sealant compositions was determined by X-ray diffraction (XRD) analysis.

Finally, obtained results revealed that this research may provide the possible solution of forming a cost-effective, environmentally-friendly and high-efficient ceramic sealants for application in IT-SOFC by incorporating waste materials in its composition, without significant negative effects on its performance and main properties.