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
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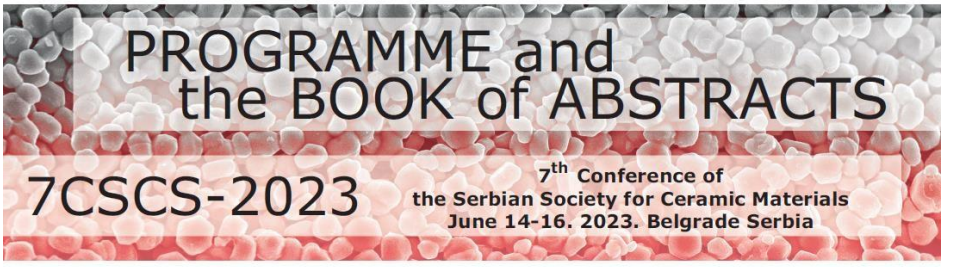

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Jelena Maletaškić
Vladimir V. Srdić

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June 14-16, 2023
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Edited by:
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SPECIAL THANKS TO

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ТЕХНОЛОШКОГ РАЗВОЈА И ИНОВАЦИЈА

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ENTROPY-STABILIZED OXIDES OWNING FLUORITE STRUCTURE: PREPARATION AND SINTERING

Marija Prekajski Đorđević[1], Jelena Erčić[1], Emilija Nidžović[1], Aleksa Luković[1], Ravi Kumar[2,3], Branko Matović[1], Jelena Maletaškić[1]

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Entropy-Stabilized Oxides are advanced ceramic materials that possess highly desirable functional properties. Through a five-component oxide formulation, these materials utilize configurational entropy to achieve phase stabilization. In this study we have successfully synthesized a novel type of high-entropy fluorite oxide, specifically $Zr_{0.2}Hf_{0.2}Ce_{0.2}Yb_{0.2}Gd_{0.2}O_{2-\delta}$, through the Self Propagation Room Temperature reaction (SPRT) method. Through heat treatment experiments, it was observed that the phase composition of all samples remained a single phase after high-temperature heating. Furthermore, a thermal treatment at 1500°C resulted in a fully crystallised single-phase fluorite structure. The powders also demonstrated a lack of agglomeration, which allowed for the sintered specimen to exhibit sufficient densification with a small porosity that was uniformly distributed throughout the samples.

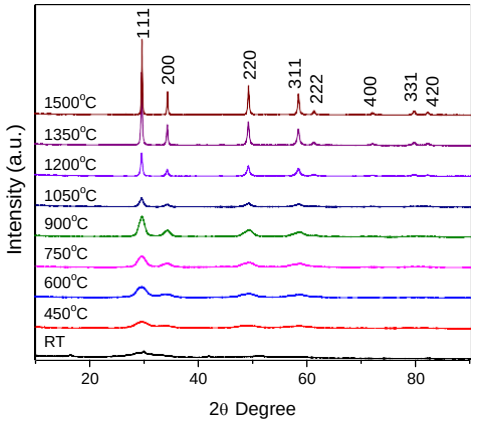

Figure 1. XRD patterns of synthesized and thermaly treated $Zr_{0.2}Hf_{0.2}Ce_{0.2}Yb_{0.2}Gd_{0.2}O_{2-\delta}$ samples