

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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**EFFECT OF Cu DOPING ON MICROSTRUCTURAL,
THERMOELECTRIC AND MECHANICAL PROPERTIES
OF NaCo₂O₄ CERAMICS**

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Ceramic samples of NaCo_{2-x}Cu_xO₄ (x = 0, 0.01, 0.03, 0.05) were obtained after calcination of powder precursors synthesized by a mechanochemically assisted solid-state reaction method (MASSR) and a citric acid complex method (CAC). Effects of small concentrations of Cu doping and the above-mentioned syntheses procedures on the microstructural, thermoelectric and mechanical properties were observed. The electrical resistivity (ρ), the thermal conductivity (κ) and the Seebeck coefficient (S) were measured simultaneously in the temperature gradient (ΔT) between hot and cold side of the sample, and the figure of merit (ZT) was subsequently calculated. ZT of the CAC samples was higher compared with the MASSR samples. The highest ZT value of 0.061 at $\Delta T = 473$ K was obtained for the sample with 5 mol% of Cu prepared by the CAC method, and it was 1.7 times higher than the highest value obtained for the MASSR sample with 3 mol% of Cu ($ZT = 0.036$ at $\Delta T = 473$ K). The CAC samples showed better mechanical properties compared to the MASSR samples due to the higher hardness of the CAC samples which is a consequence of homogeneous microstructure and higher density obtained after sintering of these samples. The results confirmed that, besides the concentration of Cu, the synthesis procedure considerably affected the microstructural, thermoelectric and mechanical properties of NaCo₂O₄ ceramics.