

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

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the Serbian Society for Ceramic Materials  
June 28-29. 2022. Belgrade Serbia

Edited by:  
**Branko Matović**  
**Aleksandra Dapčević**  
**Vladimir V. Srdić**

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## VISIBLE-LIGHT PHOTOCATALYTIC DEGRADATION OF MORDANT BLUE 9 BY BiVO<sub>4</sub> NANOPOWDER

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CaMnO<sub>3</sub>-based ceramics doped with gadolinium has become a matter of great scientific interest, because of their physical, electronic and magnetic properties, and many intriguing phenomena, such as colossal magnetoresistance (CMR) involving potential applications in magnetic memory devices and sensors. Electronic properties of CaMnO<sub>3</sub> doped with different amount of gadolinium were investigated using combination of experimental and theoretical methods. Spectroscopic Ellipsometry has been used to study electronic properties and band gap variation as function of Gd doping (up to 20% Gd). Furthermore, for each of the structure candidates, a local optimization on the *ab initio* level using density-functional theory (DFT), hybrid (B3LYP) and the Hartree–Fock (HF) method was performed.

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## INVESTIGATING SORPTIVE ASPECTS OF CoMoO<sub>4</sub> NANOPOWDERS SYNTHESIZED BY SPRT METHOD

Milena Rosić<sup>1</sup>, Maria Čebela<sup>1</sup>, Dragana Jordanov<sup>1</sup>, Nebojša Labus<sup>2</sup>,  
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Nanosized CoMoO<sub>4</sub> solid solution was successfully synthesized at room temperature using simple and fast Self Propagating Room Temperature procedure (SPRT). The structural, textural, morphological and surface characteristics of the nanosized CoMoO<sub>4</sub> were examined in detail by X-ray diffraction (XRD), Fourier transform infrared (FT-IR) spectra, Field emission scanning electron microscopy

(FESEM), and nitrogen sorption method. X-ray powder diffraction (XRPD) reflected the presence of two different phases that are in the same space group. The  $\alpha$ -CoMoO<sub>4</sub> and the  $\beta$ -CoMoO<sub>4</sub> modification crystallizes in the monoclinic space group *C2/m*, No.12, but the  $\beta$ -phase clearly distinct from the  $\alpha$ -phase due to the tetrahedral coordination of the Mo<sup>6+</sup> ions. Adsorption tests were studied over CoMoO<sub>4</sub> nanopowders under different experimental conditions (material dosage, initial concentration of pollutant textile dye, etc). The obtained results showed acceptable sorption characteristics of the material.

1. D. Zagorac, J.C. Schön, M. Rosić, J. Zagorac, D. Jordanov, J. Luković, B. Matović, *Crystal Res. Technol.*, **52** [10] (2017) 1700069.

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## **ION MIGRATION IN SPINEL STRUCTURE IN NICKEL AND ZINC FERRITE NANOPOWDERS SYNTHESISED BY CO-PRECIPIATION AND HYDROTHERMAL METHODS**

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Nickel and zinc ferrite systems were synthesized as single phase materials, core/shell composites and mixed ferrite phase using co-precipitation and hydrothermal methods. Evolution of spinel structure and degree of inversion were followed by using XRD and Raman spectroscopy. Rietveld refinement was used to evaluate crystal structure parameters and phase composition. Deconvolution of Raman spectra was used in order to determine cation coordination and degree of inversion. It was established that both zinc and nickel ferrite showed mixed ferrite characteristics which is in contrast with their bulk structures. TEM micrographs confirmed formation of core/shell particles with distinct nickel ferrite core and zinc ferrite shell with the sizes of about 100 nm.