

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

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

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

Programme and Book of Abstracts of The Sixth Conference of The Serbian Society for Ceramic Materilas **publishes abstracts from the field of ceramics, which are presented at international Conference.**

***Editors-in-Chief***

Dr Branko Matović  
Prof. Aleksandra Dapčević  
Prof. Vladimir V. Srdić

***Publisher***

Institut za multidisciplinarna istraživanja  
Kneza Višeslava 1, 11000 Belgrade, Serbia

***For Publisher***

Dr Dragica Stanković

***Printing layout***

Vladimir V. Srdić

***Press***

Faculty of Technology and Metalurgy, Research and Development Centre of Printing  
Technology, Karnegieva 4, Belgrade, Serbia

*The year off issue:*

2022.

ISBN 987-86-80109-23-7

CIP - Каталогизacija у публикацији  
Народна библиотека Србије, Београд

666.3/.7(048)  
66.017/.018(048)

DRUŠTVO za keramičke materijale Srbije. Konferencija (6 ; 2022 ; Beograd)

Programme ; and the Book of Abstracts / 6th Conference of The Serbian Society for Ceramic Materials, 6CSCS-2022, June 28-29, 2022, Belgrade, Serbia ; [organizers] The Serbian Society for Ceramic Materials ... [et al.] ; edited by Branko Matović, Aleksandra Dapčević, Vladimir V. Srdić. - Belgrade : Institut za multidisciplinarna istraživanja, 2022 (Belgrade : Faculty of technology and metalurgy, Research and development centre of printing technology). - 91 str. : ilustr. ; 25 cm

Tiraž 120. - Str. 7: Welcome message / Branko Matovic. - Registar.

ISBN 978-86-80109-23-7

a) Керамика -- Апстракти б) Наука о материјалима -- Апстракти  
в) Наноматеријали -- Апстракти

COBISS.SR-ID 69088009

**The Serbian Society for Ceramic Materials**  
**Institute for Multidisciplinary Research, 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**

**6<sup>th</sup> Conference of The Serbian Society for  
Ceramic Materials**

**June 28-29, 2022**

**Belgrade, Serbia**

**6CSCS-2022**

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

P-29

## EFFECT OF Ag DOPING ON THE MORPHOLOGICAL AND MAGNETIC PROPERTIES OF CuO NANOSTRUCTURES

Maria Čebela<sup>1,2</sup>, Pavla Šenjug<sup>2</sup>, Dario Barišić<sup>2</sup>, Milena Rosić<sup>1</sup>,  
Vesna Lojpur<sup>1</sup>, Damir Pajić<sup>2</sup>

<sup>1</sup>*Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia,  
University of Belgrade, Belgrade, Serbia*

<sup>2</sup>*Department of Physics, Faculty of Science, University of Zagreb,  
Bijenička c. 32, HR-10000 Zagreb, Croatia*

The influence of Ag doping on the crystal structure and magnetic properties of CuO nanopowders was investigated. Nanoparticles of copper–silver oxide solid solutions with composition  $\text{Cu}_{1-x}\text{Ag}_x\text{O}$  ( $x=0.01-0.05$ ) were successfully produced by using self-propagating room temperature synthesis using reaction between metal nitrates and sodium hydroxide. Prepared powders were calcinated at 700 °C for 2 h. The diffraction pattern was recorded at room temperature and atmospheric pressure without of any re-heating of the sample. A fitting refinement procedure using the Rietveld method was performed which showed the incorporation of  $\text{Ag}^{3+}$  ions in the CuO crystal lattice, where they substitute  $\text{Cu}^{2+}$  ions. Magnetic behaviour of synthesized materials was investigated by SQUID magnetometer in temperature interval 2–400 K. It is known that copper(II) oxide exhibits ferroelectricity driven by magnetic order at temperature as high as 230 K [1]. Multiferroic phase is present above the first order phase transition at  $T_{N1} = 213$  K and exists up to the subsequent first order phase transition  $T_{N2} = 230$  K [1,2]. It was shown that disorder in the form of impurities can stabilize the ferroelectric phase [2] this was our motivation to dope CuO with Ag in order to improve further its multiferroic properties. In  $\text{Cu}_{1-x}\text{Ag}_x\text{O}$  small changes of magnetic properties were observed if compared to CuO. Transmission electron microscopy (TEM) and the scanning electron microscopy (SEM) were used to determine the particle size and morphology.

1. T. Kimura, Y. Sekio, H. Nakamura, T. Siegrist, A.P. Ramirez, *Nature Mater.*, **7** (2008) 291.
2. J. Hellsvik, M. Balestieri, T. Usui, A. Stroppa, A. Bergman, L. Berqvist, D. Pabakaran, O. Eriksson, S. Picozzi, T. Kimura, J. Lorenzana, *Phys. Rev. B*, **90** (2014) 014437.