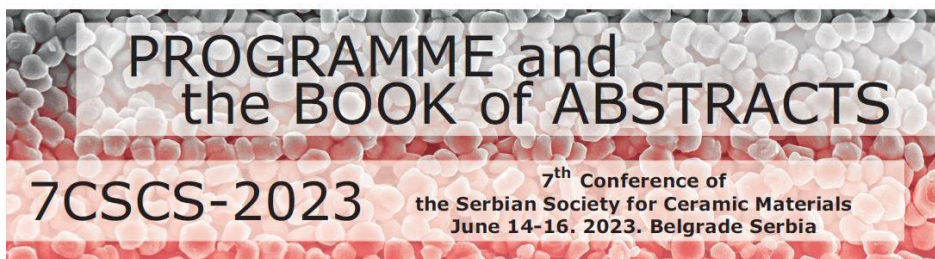


The Serbian Society for Ceramic Materials  
Institute for Multidisciplinary Research (IMSI), University of Belgrade  
Institute of Physics, University of Belgrade  
Center of Excellence for the Synthesis, Processing and Characterization of  
Materials for use in Extreme Conditions "CEXTREME LAB" - Institute 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



Edited by:  
**Branko Matović**  
**Jelena Maletaškić**  
**Vladimir V. Srdić**

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**Research, University of Belgrade**  
**Faculty of Technology and Metallurgy, University of Belgrade**

# **PROGRAMME AND THE BOOK OF ABSTRACTS**

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

**June 14-16, 2023**  
**Belgrade, Serbia**  
**7CSCS-2023**

Edited by:  
**Branko Matović**  
**Jelena Maletaškić**  
**Vladimir V. Srdić**

**SPECIAL THANKS TO**



**Република Србија  
МИНИСТАРСТВО НАУКЕ,  
ТЕХНОЛОШКОГ РАЗВОЈА И ИНОВАЦИЈА**



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**11.25 – 11.45 h, Invited lecture, I-3**

Ankit Srivastava, *IN-SITU ANALYSIS OF DAMAGE TOLERANCE MECHANISMS IN LAYERED CRYSTALS*

**11.45 – 12.05 h, Invited lecture, I-4**

Peter Tatarko, *NEW HIGH-ENTROPY CERAMICS FOR EXTREME ENVIRONMENT APPLICATIONS*

**12.05 – 12.25 h, Invited lecture, I-5**

Jelena Mitrović, *CORRELATION BETWEEN THE MICROSTRUCTURE AND ELECTRICAL PROPERTIES OF Sb-DOPED BaSnO<sub>3</sub> CERAMICS*

**12.25 – 12.40 h, Oral presentation, O-3**

Manuel Gruber, *EXPLORING THE USE OF ADVANCED CERAMICS FOR SPARK PLUG ELECTRODES OF LARGE GAS ENGINES*

**12.40 – 12.55 h, Oral presentation, O-4**

Inga Zhukova, *DESIGN, SYNTHESIS, AND MECHANICAL PROPERTIES OF DIBORIDE STRUCTURES WITH DIFFERENT MOLAR RATIOS OF TRANSITION METALS (Ti-Zr-Hf-Nb-Ta)*

**12.55 – 13.10 h, Oral presentation, O-5**

Miloš Dujović, *DEFORMATION AND FRACTURE RESPONSE OF SINGLE CRYSTAL MAX PHASES*

**13.10 – 14.20 h, Lunch break**

**13.10 – 14.20 h, Poster Session 1 (Posters P1 – P25)**

**Session 3: Advanced materials for energy-related applications**

Chair: Jelena Bobić, Ivana Cvijović Alagić

**14.20 – 14.40 h, Invited lecture, I-6**

Jelena Bobić, *TWO-PHASE AND THREE-PHASE FLEXIBLE THICK FILMS: POTENTIAL USE AS ENERGY STORAGE AND ENERGY HARVESTING SYSTEMS*

**14.40 – 14.55 h, Oral presentation, O-6**

Mirjana Vijatović Petrović, *ENHANCED PROPERTIES OF PVDF COMPOSITES BY ACTIVE PHASE SILANIZATION* Priyanka Reddy, *NOVEL ELECTRONIC MATERIALS ON THE VERGE OF METALLICITY AND IONICITY*

**14.55 – 15.10 h, Oral presentation, O-7**

Priyanka Reddy, *NOVEL ELECTRONIC MATERIALS ON THE VERGE OF METALLICITY AND IONICITY*

I-5

## CORRELATION BETWEEN THE MICROSTRUCTURE AND ELECTRICAL PROPERTIES OF Sb-DOPED BaSnO<sub>3</sub> CERAMICS

Jelena Mitrović<sup>1</sup>, Milica Počuča-Nešić<sup>1</sup>, Aleksandar Malešević<sup>1</sup>,  
Zorica Branković<sup>1</sup>, Katarina Vojisavljević<sup>1</sup>, Slavica Savić<sup>2</sup>, Vesna Ribić<sup>3</sup>,  
Sandra Drev<sup>3</sup>, Matejka Podlogar<sup>3</sup>, Slavko Bernik<sup>3</sup>, Željko Rapljenović<sup>4</sup>,  
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<sup>4</sup>*Institute of Physics, Zagreb, Croatia*

The non-magnetic, non-inductive electroconductive materials with linear current-voltage characteristic and low and almost constant electrical resistivity in the wide temperature range could be used in conditions unfavorable for metals and alloys. Particular emphasis is placed on the performance and endurance of these materials in conditions at constant high voltage, current, and energy, as well as operating in acidic and humid environmental conditions.

The aim of this work was to investigate the influence of antimony concentration and sintering parameters on the structure, microstructure, and electrical properties of antimony-doped barium stannate, BaSn<sub>1-x</sub>Sb<sub>x</sub>O<sub>3</sub> (BSSO,  $x = 0,00; 0,04; 0,06; 0,08$  and  $0,10$ ) to obtain conductive electroceramic samples with linear current-voltage ( $I-U$ ) characteristics and low electrical resistivity. For this purpose three different sintering techniques were used: conventional, spark plasma and cold sintering.

According to the X-ray diffraction (XRD) analysis, single-phase ceramic materials with cubic BaSnO<sub>3</sub> structure were obtained by conventional sintering at 1600 °C for 3 h and spark plasma sintering at 1100 °C for 5 min. Raising the spark plasma sintering temperature to 1200 °C induced the formation of Ba-rich secondary phase, Ba<sub>2</sub>SnO<sub>4</sub>. XRD analysis confirmed the presence of unreacted SnO<sub>2</sub> and BaCO<sub>3</sub> in cold sintered BaSn<sub>0,92</sub>Sb<sub>0,08</sub>O<sub>3</sub> sample (310 °C for 5 min, 20 wt.% 1 M acetic acid). Scanning electron microscopy (SEM) indicates a significant decrease in grain size upon doping, regardless of the sintering technique. High-resolution transmission electron microscopy (HRTEM) revealed the presence of low angle grain boundaries (LAGBs) in conventionally and spark plasma sintered (1200 °C for 5 min) samples with  $x = 0,08$ . The results of electrical measurements confirmed the semiconducting properties of all BSSO, except the spark plasma sintered BaSn<sub>0,92</sub>Sb<sub>0,08</sub>O<sub>3</sub> (1200 °C for 5 min) sample. This sample showed linear current-voltage characteristic, the lowest and almost constant electrical resistivity in the temperature range of 25–150 °C resulting from the loss of potential barriers at grain boundaries due to the large fraction of LAGBs present in BaSn<sub>0,92</sub>Sb<sub>0,08</sub>O<sub>3</sub> ceramic sample.