

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

A microscopic image of ceramic particles, showing a transition from white to red. The particles are spherical and densely packed. The top half is white, and the bottom half is red, with a horizontal band of red particles in the middle.

PROGRAMME and the BOOK of ABSTRACTS

4CSCS-2017

4th Conference of
the Serbian Society for Ceramic Materials
June 14-16.2017. Belgrade Serbia

Edited by:
Branko Matović
Zorica Branković
Dušan Bućevac
Vladimir V. Srdić

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PROGRAMME AND THE BOOK OF ABSTRACTS

**4th Conference of The Serbian Society for
Ceramic Materials**

June 14-16, 2017

Belgrade, Serbia

4CSCS-2017

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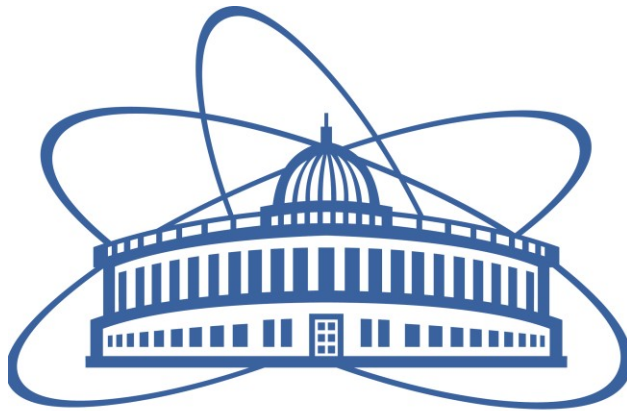
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WELCOME MESSAGE

On behalf of the organizers and organizing committee of the 4th Conference of the Serbian Society for Ceramic Materials (4CSCS-2017), I would like to extend my warmest welcome to all of you for attending the 4CSCS-2017. The conference is hosted and organized by the Serbian Society for Ceramic Materials, and co-organized by Institute for Multidisciplinary Research - University of Beograd, Institute of Physics - University of Beograd, Center of excellence for the synthesis, processing and characterization of materials for use in extreme conditions “CEXTREME LAB” - Institute of Nuclear Sciences Vinca, University of Belgrade and Faculty of Mechanical Engineering, University of Belgrade.

The goal of the Conference is to provide a platform for academic exchange among participants from universities, institutes, companies around the region in the field of ceramics research as well as to explore new direction for future development. 4CSCS-2017 aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Ceramic Materials. It also provides the premier inter-multi-trans-disciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns, practical challenges encountered and the solutions adopted in the field of Ceramic Materials. We have received more than 100 abstracts submitted from 15 countries.

The Conference will feature two plenary lectures, 25 invited talks and more than 70, oral and poster presentations as well as exhibitions of some new ceramic materials and devices. 4CSCS-2017 includes Ceramic Powders, Characterization and Processing, High temperature Phenomena, Sintering, Microstructure Design and Mechanical Properties, Electro and Magnetic Ceramics, Ceramic Composites, Membranes and Multimaterials, Traditional Ceramics and Computing in Materials Science. Exhibitions from company sponsors will be held at the Conference as well.

We are grateful for the support from the Ministry of Education, Science and Technological Development of the Republic of Serbia. We would also like to express our sincere thanks to the symposia organizers, session chairs, presenters, exhibitors and all the Conference attendees for their efforts and enthusiastic support in this exciting time in Belgrade. I look forward to meeting you and interacting with you at Conference.

4CSCS-2017 President

Branko Matovic

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THE OVERVIEW OF BARIUM TITANATE PROPERTIES AND APPLICATION OPPORTUNITIES

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Barium titanate (BT) is a ferroelectric material with a perovskite structure important in the field of electronics. Due to high flexibility of its crystal lattice it has the capability to host ions with different oxidation state and careful selection of dopants could enable tailoring of barium titanate structure and electrical properties.

Barium titanate doped with La, Sb, Sm, Nb and Mn will be presented in the light of structural changes and their influence on electrical properties modification. Doping with La, Sb and Sm in very low concentrations induces symmetry change from tetragonal to pseudo-cubic. La, Sb, Nb and Sm are proven to be grain growth inhibitors, with the different effect on obtained ceramics density. Dielectric permittivity value was significantly changed depending on dopant kind and concentration. Partial substitution of Ba or Ti ions by some of this dopants induced the movement of phase transition peaks to the lower temperatures and caused the formation of diffuse phase transition. In this way, the application of barium titanate can be widened from capacitors to PTCR sensors, gas and humidity sensors, etc.

In the recent years, there is a growing interest for multiferroic materials with barium titanate as a main component. When being mixed with ferrites in the multiferroic composites the electrical properties of barium titanate are being compromised. Dielectric permittivity starts to decrease in comparison with pure BT ferroelectric material. Using of doped barium titanate as a part of the multiferroic material could enhance the overall dielectric permittivity of barium titanate and therefore the dielectric properties of the multiferroic material. Mixing route was used for the preparation of BaTiO₃-NiFe₂O₄, BaTiO₃-NiZnFe₂O₄, Ba(Sb)TiO₃-NiFe₂O₄ composite materials. Magnetic and electrical properties of multiferroic materials have shown the dilution effect due to existence of both, ferroelectric and ferrite phases in the same material.