

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 dense arrangement of small, rounded grains. The top half of the image is in grayscale, while the bottom half is in color, showing a gradient from white to red. The text is overlaid on this image.

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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INFLUENCE OF La, Yb AND Gd SUBSTITUTION ON MAGNETIC BEHAVIOUR OF BULK BiFeO₃

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Bismuth ferrite, BiFeO₃ is perovskite multiferroic often studied because of its high ferroelectric and magnetic ordering temperatures, 1100 K and 630 K, respectively. Despite its room temperature multiferroicity, pure BiFeO₃ is of limited technological importance, especially in bulk ceramic form, due to the antiferromagnetic state with very low net magnetic moment. Doping of BiFeO₃ could disturb the antiferromagnetic order and induce magnetically ordered state with considerable magnetization coming from the uncompensated or canted spins. Therefore, magnetic behaviour of BiFeO₃ doped with the heavy rare earth elements such as La, Yb and Gd, was investigated.

Compounds of BiFeO₃ in which 10% of Bi atoms are substituted with La, Yb and Gd were prepared using the hydro-evaporation synthesis. Magnetization of polycrystalline samples in powder form was investigated in a broad temperature range of 2–900 K. Splitting between the zero field cooled (ZFC) and field cooled (FC) magnetization curves indicate development of the weak ferromagnetism below the Néel temperature of around 610–640 K which is dependent on the composition. Magnetic hysteresis loops measured at the low temperature (5 K), room temperature, and high temperatures, just under and above transition temperature, also suggest the weak ferromagnetic behavior with relatively high coercive field.

Complete magnetic results in full temperature range (2–900 K) clearly indicate enhancement of the weak ferromagnetism after performed substitution with rare earth elements La, Yb and Gd in bulk BiFeO₃ ceramic.

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