Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION V
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials
School of Electrical Engineering and Computer Science of Applied Studies

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 21st-23rd September 2016.

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OR1

The Rare-Earths influences on doped $BaTiO_3$ - Ceramics Microstructure and Electric Characteristics

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The influence of rare-earth additive content on microstructure and electric properties of doped $BaTiO_3$ ceramics is investigated. The concentration of Er_2O_3 and Yb_2O_3 in the doped samples range from 0.01 to 1.0at % . The samples are prepared by the conventional solid state reaction, and sintered at 1320° and 1350°C in air atmosphere for 4 hours. SEM analysis shows that all samples are characterized by polygonal grains. The uniform and homogeneous microstructure with grain size ranged from 20 to 45μm is the main low doped samples characteristics. For the samples doped with the higher dopant concentration (0.5 and 1.0 at%) the average grains size is ranged from 5 to 10μm. Dielectric measurements are carried out as a function of temperature up to 180°C at different frequencies. The low doped samples display the high value of dielectric permittivity at room temperature. A nearly flat permittivity-temperature response is obtained in specimens with higher additive content. The Curie temperature of doped samples were ranged from 126 to 130°C. The Curie constant for all series of samples decrease with increment of dopant concentration and the lowest values is mesured from samples doped with 0.01 wt% of aditive. The obtained value of γ pointed out that the specimens have almost sharp phase transition. Also, the specific electrical resistance is measured in function of temperature at the different frequencies from 100Hz to 1MHz. With increasing additives concentration, the electrical resistance decreases to the concentration of 0.5 at% and then increases.

OR2

Implementation of Wide-Bandgap Materials in Power Electronics Components

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Wide-Bandgap (WBG) materials such as GaN and SiC are more and more frequently implemented in modern electronic components especially for switching in power electronic and electrical systems. A study of the properties of these materials and of the mapping of their properties into the performances of the electronic components built of them is of curtail importance for the design of modern power electrical systems based on renewable energy sources (with emphasis on micro-grids and smart-grids). Here, after studying the basic general and electrical properties of the materials, the fundamental behaviour of the power electronic components used for switching will be presented. The comparisons will encompass classical silicon (Si) power electronic components (MOS i IGBT) as well as components based on GaN (HEMT) and SiC