

**Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION**

Organized by
**Serbian Ceramic Society
&
Institute of Technical Sciences of SASA**

PROGRAM AND THE BOOK OF ABSTRACTS

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Ho₂O₃ Additive Effects on Microstructure and Dielectrical Properties of BaTiO₃ Ceramics

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Doped BaTiO₃-ceramics is very interesting for its application as resistors with PTCR, multilayer ceramics capacitors, thermal sensors etc.

Ho doped BaTiO₃ ceramics, with different Ho₂O₃ content, ranging from 0.01 to 1.0 wt% Ho, were investigated regarding their microstructural and dielectric characteristics. The samples were prepared by the conventional solid state reaction and sintered at 1320°, 1350 °C and 1380°C in an air atmosphere for 4 hours.

The grain size and microstructure characteristics for various samples and their phase composition were carried out using a scanning electron microscope SEM equipped with EDS system. SEM analysis of Ho/BaTiO₃ doped ceramics showed that in samples doped with a low level of rare-earth ions, the grain size ranged from 10-40µm, while with the higher dopant concentration the abnormal grain growth is inhibited and the grain size ranged between 2-10µm.

Dielectric measurements were carried out as a function of temperature up to 180°C. The low doped samples sintered at 1380°C, display the high value of dielectric permittivity at room temperature, 2500 for 0.01Ho/BaTiO₃. A nearly flat permittivity-response was obtained in specimens with higher additive content. Using a modified Curie-Weiss law the Curie constant (C') and a critical exponent γ were calculated. The obtained values of γ pointed out the diffuse phase transformation in heavily doped BaTiO₃ samples.