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ADVANCED CERAMICS AND APPLICATION

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&
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PROGRAM AND THE BOOK OF ABSTRACTS

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Ho_2O_3 Additive Effects on Microstructure and Dielectrical Properties of $BaTiO_3$ Ceramics

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Doped $BaTiO_3$-ceramics is very interesting for its application as resistors with PTCR, multilayer ceramics capacitors, thermal sensors etc.

Ho doped $BaTiO_3$ ceramics, with different Ho_2O_3 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 ^oC and1380^oC 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/$BaTiO_3$ 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 to180°C. The low doped samples sintered at 1380°C, display the high value of dielectric permittivity at room temperature, 2500 for 0.01Ho/$BaTiO_3$. A nearly flat permittivity-response was obtained in specimens with higher additive content. Using a modified Curie-Weiss low 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 $BaTiO_3$ samples.