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

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**Institute of Chemistry Technology and Metallurgy**
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# PROGRAM AND THE BOOK OF ABSTRACTS

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# The Electrical Characteristics of Nb doped $BaTiO_3$ Ceramics

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The Nb doped $BaTiO_3$ ceramics, with different $Nb_2O_5$ content, ranging from 0.5 to 2.0 at% Nb, were investigated regarding their electrical characteristics in this paper. Nb/$BaTiO_3$ ceramics using in this investigation were prepared by the conventional solid state reaction and sintered at 1320°C in an air atmosphere for 2 hours.

The dielectric characteristic of doped $BaTiO_3$ ceramics like as dielectric constant, dissipation factor, impedance (resistance, reactance) have been done by using LCR-Meter Agilent 4284A in the frequency range 20 Hz-1 MHz and Agilent E4991A RF Impedance/Material Analyzer for high frequency measurements (1 MHz – 3 GHz).

Dielectric constant and tangent losses after initial large values remains nearly independent of frequency greater than 3 kHz. Dielectric measurements were carried out as a function of temperature up to 180°C. The low doped samples sintered at 1320°C, display the high value of dielectric permittivity at room temperature, 2600 for 0.5Nb/$BaTiO_3$. A nearly flat permittivity-temperature response was obtained in specimens with 2.0 at% additive content. The Curie-Weiss and modified Curie-Weiss law is used to clarify the influence of dopant on the dielectric properties and $BaTiO_3$ phase transformation. All investigated samples have an electrical resistivity $\rho > 10^5$ Ωcm at room temperature.