

Grain and Grain Boundary Behavior of Sm Substituted Barium Titanate Based Ceramics

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Abstract : A series of polycrystalline ferroelectric ceramics with compositional formula $Ba_{0.80-x}Sm_xPb_{0.20}Ti_{0.90}Zr_{0.10}O_3$ with x varying from 0 to 0.01 in the steps of 0.0025 has been prepared by solid state reaction method. The dielectric constant and tangent loss was measured as a function of frequency from 100Hz to 1MHz at different temperatures (200-500°C). The electrical behavior was then investigated using complex impedance spectroscopy (CIS) technique. From the CIS study, it has been found that there is a contribution of both grain and grain boundary in the electrical behavior of such ceramics. Grain and grain boundary resistivity and capacitance were calculated at different temperature using CIS technique. The present paper is about the discussion of grain and grain boundary contribution towards the electrical properties of Sm modified BaTiO₃ based ceramics at high temperature.

Keywords : grain, grain boundary, impedance, dielectric

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