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Electrical and Dielectric Characteristics of BiSmO₃

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The synthesis of the perovskites BiSmO₃ was done by the solid-state reaction method. In this communication, the structural and detailed electrical (dielectric, impedance, and conductivity) properties of the material were studied. The X-ray diffraction of BiSmO₃ confirmed the conformation of mixed phase perovskites with a cubic crystal structure. The dielectric behavior of the sample is analyzed in a broad frequency range (1 kHz–1 MHz) and temperature range (25.500°C). The electrical parameters, like resistance and capacitance of grain and grain boundary of the studied material, were obtained by simulating the experimental impedance data with an equivalent circuit of {(CQR) (CR)}. The calculated optical band gap is 2.4 eV. The NTCR (negative temperature coefficient of resistance) behavior of the ceramic is analyzed from dielectric and impedance studies.

Keywords: rare earth, BiSmO₃, dielectric spectroscopy, impedance, conductivity.