

Comparison of impedance Properties of $\text{BaSr}_4\text{RTi}_3\text{V}_7\text{O}_{30}$ (R = Dy, Sm)

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Abstract : Ferroelectric materials play an important role in the field of materials research as they exhibit non-linear spontaneous polarization, high dielectric constant, negative temperature coefficient of resistance behavior which lead to their applications in many devices like ferroelectric random access memory and display, microwave dielectric resonators etc.. In the present research work, polycrystalline samples of $\text{BaSr}_4\text{RTi}_3\text{V}_7\text{O}_{30}$ (R = Dy, Sm) are synthesized by a high temperature solid state reaction technique. The effect of temperature on impedance parameters is studied using an impedance analyzer in a wide frequency range (10^2 – 10^6 Hz) at different temperatures. The real and imaginary part of complex impedance traces semicircle(s) in the complex planes for both the compounds. The bulk resistance of the material decreases with rise in temperature. This exhibits a typical negative temperature coefficient of resistance (NTCR) behavior of the material. The temperature dependent modulus plots reveal the presence of both bulk and grain boundary effects at higher temperature.

Keywords: Ceramics; electric properties. Impedance properties

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