

Study on electrical and magnetic properties of structural ordering of double Perovskite material.

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Abstract:

Understanding and realization of Multiferroic materials properties at room temperature are gained significant importance in recent days for advance in multifunction devices. Suitable selection and process of the materials are very important prerequisite for development of multiferroic properties in the materials for the multifunction devices applications. In addition to multifunctional spintronics devices applications, these multiferroic materials used for smaller, faster and energy efficient data storage which is huge demand of future technology.

In present study, to enhance the multiferroic properties with strong coupling double perovskite structure $\text{Bi}_2\text{NiMnO}_6$ is considered under study. This composites gained significant importance with low leaking current and shows both ferromagnetic transition temperature $T_{\text{CM}} = 144 \text{ K}$ and ferroelectric ferroelectric transition temperature $T_{\text{FE}} = 485 \text{ K}$ properties. $\text{Bi}_2\text{NiMnO}_6$ shows large moment of ferromagnetically coupled Ni and Mn spins. In the present work, double perovskite $\text{Bi}_2\text{NiMnO}_6$ nanoparticles are prepared by chemical co-precipitation method and are studied, thermal, magnetic, electrical properties systematically in order to identify its suitability for suitability in devices applications.

Key words: Strong coupling, Multifunctional & Double Perovskite structure