

*Structural, magnetic and dielectric properties of $\text{La}_2\text{Ni}_{1-x}\text{Mn}_{1+x}\text{O}_6$ ($-0.50 < x < 0.50$)*Mohd. Nasir¹, Saniya Ayaz¹, Sunil Kumar¹, Somaditya Sen¹¹Department Of Physics, IIT Indore, Indore, India

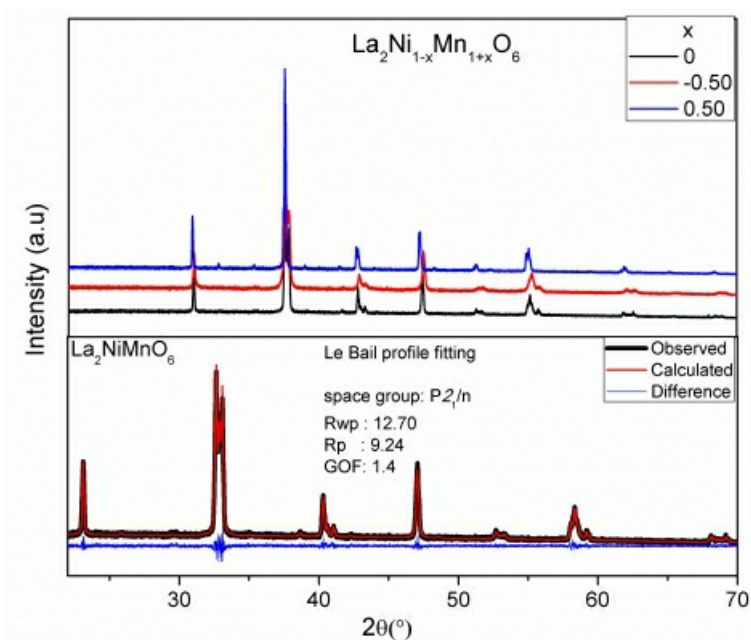
E-mail: nasir2alig@gmail.com

The effect of change in Ni/Mn content on structural, magnetic and dielectric properties of polycrystalline $\text{La}_2\text{NiMnO}_6$ (LNMO) ceramics prepared by sol-gel technique have been examined. The relative variation in Ni/Mn, strongly affects the crystallographic, magnetic and dielectric properties of $\text{La}_2\text{NiMnO}_6$ double perovskite. Le Bail fitting of XRD data shows that LNMO possess the majority of monoclinic crystallographic phases (P2₁/n) with a partially ordered arrangement of Ni and Mn cations. The magnetic characterization and x-ray absorption spectroscopy (XAS) analysis reveal the presence of Ni²⁺ and Mn⁴⁺ in all samples. The change in TC is observed with change in Ni/Mn ratio. The presence of spin glass like behaviour is revealed for Ni or Mn enriched LNMO. The giant dielectric constant $\sim 10^4$ have been observed for all ceramics. The temperature dependent dielectric constant, ϵ_r , shows step like behaviour with corresponding relaxation peaks appearing in the dielectric loss, $\tan\delta$. Our study explain the origin of spin glass like behaviour, giant dielectricity and emphasise that asymmetric hopping plays an important role in dielectric properties. The dielectric properties, also strongly depend on the relative-spin orientations between neighboring magnetic ions. Here, we discuss the role of variation in Ni/Mn content and antisite (Ni-Mn) disorder in emergence of these properties.

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