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Title: Structural and magnetic properties of $La_2Ni_{1-x}Co_xMnO_6$ compounds

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Highlights

1. $La_2Ni_{1-x}Co_xMnO_6$ (x = 0.2, 0.4, 0.8) have been prepared using sol-gel technique, in single phase with monoclinic structure ($P2_1/n$).

2. The atomic models generated using Reitveld refined structural parameters show that the structure is a double perovskite one, with octahedral distortion.

3. The study focuses on the dependence of T_C and the nature of the ferromagnetic interactions on the type of B-site (Ni/Co) ions in $A_2BB'O_6$ type double perovskites.

4. The study conclusively shows that the origin of short range ferromagnetic ordering above the Curie temperature observed in such systems is induced by antisite disorders.

5. Our study involving the measurement of ac susceptibility and IRM (t) completely discards the existence of any spin glass like phase in such system at low temperatures.