

**EFFECT OF Co SUBSTITUTION ON MAGNETIC AND
MAGNETORESISTANCE EFFECT IN $\text{La}_{0.67}(\text{Ba}_{1-x}\text{Co}_x)_{0.33}\text{MnO}_3$ SYSTEM**

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ABSTRACT

A series of polycrystalline perovskite manganite of $\text{La}_{0.67}(\text{Ba}_{1-x}\text{Co}_x)_{0.33}\text{MnO}_3$ ($x=0.00$, 0.30 and 0.50) were prepared by conventional solid-state route. XRD spectrum indicates that single phase rhombohedral perovskite structure had been obtained for $x=0.00$ sample. When Co is introduced in the Ba site, its structure is distorted from rhombohedral to pseudo-cubic. The SEM images show that the average grain sizes were found to be in $3\text{-}8\mu\text{m}$ ($x=0.30$) and $2\text{-}10\mu\text{m}$ ($x=0.50$) with less pore between the grain. For $x=0.00$, the sample is found in melted condition where no significant clear grain boundary can be found. Pure sample had TC of 343K . However, substitution of Co at Ba site brings down the Curie temperature, TC below 293K . Pure ($x=0.0$) sample shows Low Field Magnetoresistance (LFMR) effect and the effect weakens when Co is introduced. The highest low-field MR value is -13.0% for sample with $x=0.00$ in 0.1Tesla applied external magnetic field at 90K and the highest MR value of -22.5% is given by $x=0.30$ sample at 1Tesla applied magnetic field at 90K . Hence, these indicated that Co will not enhance the extrinsic MR which is due to the grain boundary effect and tend to destroy the LFMR effect.

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