

STUDY ON STRUCTURE, MICROSTRUCTURE AND ELECTRICAL PROPERTIES OF $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ SYSTEM IN BULK AND THIN FILM

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ABSTRACT

Manganite compound of $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ polycrystalline in bulk and thin film have been prepared by solid state reaction and pulsed laser ablation deposition method (PLAD), respectively. Rietveld's refinement showed both samples in single phase of orthorhombic structure with space group of Pbnm. Bulk and thin film showed much different microstructure, where bulk have relatively much more larger crystalline size (~1-2 μm) as compare to thin film (~40-60 nm) samples. Bulk sample showed typical insulator-to-metal transition (T_p) at 218 K when $H=0\text{T}$ and shift to 224 K in $H=1\text{T}$. However, thin film sample shows almost insulating over the entire range of temperature and no T_p is observed at the entire measurement range. In this work, we observed that microstructure formation change when convert from bulk to film and drastically change its electrical resistance.

Keywords: polycrystalline; perovskite manganite; thin film; magnetoresistance

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