Lattice strain effect in structural, magnetoresistance and electrical properties of La0.67Sr0.33MnO3 bulk and thin film system

ABSTRACT

Polycrystalline $La_{0.67}Sr_{0.33}MnO_3$ (LSMO) powder prepared via conventional solid state reaction was pressed into pellet form. The pellets became target to growth thin films on corning glass (LSMO-C), fused silica (LSMO-FS) and MgO (100) (LSMO-M) substrate via pulsed laser deposition (PLD) method. XRD results showed that all samples were hexagonal structure with R-3C space group. Thin films showed relatively smaller crystallite size compared to bulk samples. From Rietveld Refinement analysis, all thin films experienced lattice strain when deposited on different substrate. LSMO compound deposited in different substrate induced structure distortion and lattice strain. Compression along *c*-axis occurred when the lattice strain increased thus shifted the metal-insulator transition temperature to lower temperature and increased its resistivity.

Keyword: Magnetoresistance; Lattice strain; Thin film