Growth and characterization of $\text{La}_{5/8}\text{Ca}_{3/8}\text{MnO}_3$ films by pulsed laser deposition on silicon wafer substrate

ABSTRACT

By pulsed laser ablation magnetoresistive perovskite-like $\text{La}_{5/8}\text{Ca}_{3/8}\text{MnO}_3$ films have been successfully grown on silicon wafer substrates without any buffer layer. The X-ray diffraction (XRD) patterns of the LCMO/Si heterostructure indicate that well crystalline LCMO grows polycrystalline with average grain size of 15 nm. The LCMO films exhibited typical characteristics of CMR material with the metal-insulator transition temperature at $T_{P}=245$ K. The film has a maximum $\%\text{MR}$ of about $16.52\%$ and mean surface roughness of about 147.4 nm.

**Keyword:** Magnetoresistance; Manganite; Grain boundary; Metal–insulator transition temperature