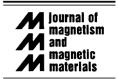


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Magnetotransport properties of perovskite La–Ba–Mn–O-deposited films on Si substrates

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Abstract

To obtain high MR ratio near room temperature in thin films grown on Si substrate, La–Ba–Mn–O thin films were prepared with various substrate temperature (T_S) from 600°C to 720°C by RF magnetron sputtering, and the structural and magnetotransport properties were studied. All films were annealed at 800°C for 30 min in ambient. The structures, magnetic properties and compositions of La–Ba–Mn–O thin films have been studied with X-ray diffraction, X-ray photoemission spectroscopy, Rutherford back-scattering spectroscopy and vibrating sample magnetometer. The MR was measured using square-probe array method in the magnetic field of 0–1.5 T. The films were polycrystalline with (100) and (110) orientations and showed pseudocubic perovskite structure. The maximum MR ratio of thin film with T_S of 680°C is 0.62 under a relatively low field of 1.5 T. Moreover, it is important to notice that the MR ratio reached 0.3 near room temperature in thin films with T_S of 600°C and 680°C.

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