[23-S18]

PROCESS PRESSURE DEPENDENCE OF MAGNETOTRANSPORT PROPERTIES IN SPUTTERED La1-xCaxMnO3 THIN FILM GROWN ON SI (100)

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The process pressure dependence of magnetotransport properties in $La_{1-x}Ca_xMnO_3$ thin films, grown on Si (100) substrate by RF magnetron sputtering, is studied. All films were annealed at 800℃ for 30min in ambient. The films are polycrystalline with (100) and (110) orientations. The thickness of films were determined to be 700~2200 Å. The thickness of films decreased with process pressure. All films showed the resistivity maximum at their own metal-insulator transition temperature (T_{MI}) except the film with the process pressure of 5 mT. The TMI of other thin films is 188 K, 218 K, 234 K and 242 K for the film with process pressure of 10 mT, 20 mT, 30 mT, and 40 mT respectively. It was found that the MR ratio of the thin films are 0.42~0.28 under the magnetic filed of 1.5T with process pressure. It is noticed that the T_{MI} of the thin films monotonically increased and the MR ratio of the thin films decreased with process pressure. It seems that the process pressure influences the Mn-O bond length and Mn-O-Mn bond angle. It leads to the monotonic variations of the out-of-plane lattice parameter and magnetotransport properties.