Journal of Alloys and Compounds 621 (2015) 7–11

Contents lists available at ScienceDirect

Journal of Alloys and Compounds

journal homepage: www.elsevier.com/locate/jalcom

Large low field magneto-resistance and temperature coefficient of resistance in $La_{0.8}Ca_{0.2}MnO_3$ epitaxial thin film

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ARTICLE INFO

Article history:
Received 23 July 2014
Received in revised form 22 September 2014
Accepted 23 September 2014
Available online 30 September 2014

Keywords:
Magnetoresistance
Temperature coefficient of resistance

ABSTRACT

An epitaxial $La_{0.8}Ca_{0.2}MnO_3/LaAlO_3$ (LCMO/LAO) thin film was fabricated using the pulsed laser deposition (PLD) technique to evaluate the magnetoresistance (MR) and temperature coefficient of resistance (TCR). The LCMO film was about 200 nm in thickness and appeared to have a strong *out-of-plane* texture. A giant value of MR 73% and 57% for both the *ab*-plane and in the *c*-directions respectively are obtained at 1.5 T applied field. The values of TCR are about 14.2% K^{-1} and 11.5% K^{-1} for both the *ab*-plane and in the *c*-directions respectively in a wide temperature range. These results proved that $La_{0.8}Ca_{0.2}MnO_3/LaAlO_3$ (LCMO/LAO) thin film is a promising candidate of perovskites for novel electronic applications.