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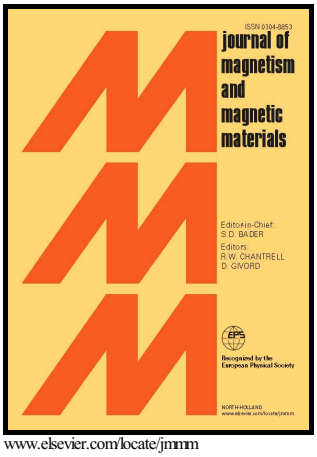

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Influence of sodium doping on the electrical and magnetic properties of $La_{0.90}Li_{0.10}MnO_3$ manganites

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Abstract

Monovalent perovskite manganites $La_{0.90}Li_{0.10-x}Na_xMnO_3$ were synthesized by using the solid-state reaction method. The crystal structure analysis presented that the samples are a single-phase rhombohedral ($R\bar{3}c$) structure with no detectable impurity phases. Magnetic measurement showed a cusp at a certain temperature $T_{C/F}$ that gradually disappeared with adding the Na content. The samples undergo ferromagnetic-paramagnetic transition, accompanying the metal-semiconductor transition at T_{ms}. There is irreversible on low field M $(T)_{ZFC}$ and M $(T)_{FC}$ curves which gradual decrease with increasing the Na doping. The resistivity values decreased and the T_{ms} increased as doping of sodium increased. In addition, two-transition temperature T_{ms} appeared just by adding the sodium. In short, the influence of partial substitution of lithium by sodium at A-site cation of lanthanum manganite on its physical properties was studied.

Keywords: A. Manganites, B. Crystallisation, C. X-ray diffraction topography, C. electrical characterization, C. magnetometer.

I. INTRODUCTION

The appearance of colossal magnetoresistance on the perovskite manganite materials provides an opportunity for scientists to reconsider the study of such materials again (a property that promises for their storage and memory applications) [1]. The $Ln_{1-x}A_xMnO_3$ materials (Ln = rare earth and A =