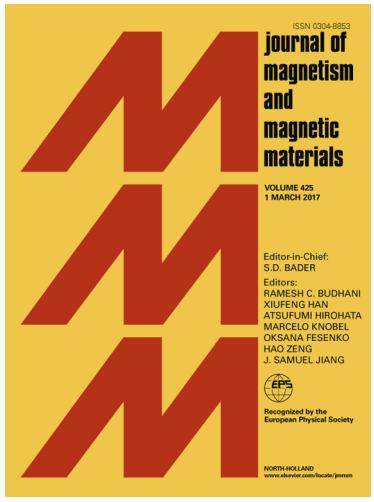

Research articles

Structural, magnetic and magnetotransport properties of $La_{0.67}Ba_{0.33-x}Rb_xMnO_3$ perovskites prepared by flux method

I. Zeydi, Asma Zaidi, J. Dhahri, E.K. Hlil

PII: S0304-8853(18)31679-2
DOI: https://doi.org/10.1016/j.jmmm.2018.09.092
Reference: MAGMA 64374

To appear in: *Journal of Magnetism and Magnetic Materials*

Received Date: 31 May 2018
Revised Date: 7 August 2018
Accepted Date: 24 September 2018

Please cite this article as: I. Zeydi, A. Zaidi, J. Dhahri, E.K. Hlil, Structural, magnetic and magnetotransport properties of $La_{0.67}Ba_{0.33-x}Rb_xMnO_3$ perovskites prepared by flux method, *Journal of Magnetism and Magnetic Materials* (2018), doi: https://doi.org/10.1016/j.jmmm.2018.09.092

Structural, magnetic and magnetotransport properties of $La_{0.67}Ba_{0.33-x}Rb_xMnO_3$ perovskites prepared by flux method

I.Zeydi[a*], Asma Zaidi[b], J. Dhahri[b], E.K.Hlil[c]

[a] Université De Monastir, Laboratoire de Micro-optoélectroniques et Nanostructures (LMON), Monastir 5000, Tunisia

[b] Laboratory of Condensed Matter and Nanoscience, Faculty of Sciences of Monastir, University of Monastir, 5000, Tunisia

[c]Institut Neel, CNRS et Université Joseph Fourier, B, P, 166, 38042 Grenoble, France

E-mail: izeydi168@gmail.com (Corresponding author)

Abstract:

We have undertaken a systematic study of the effect of Rb^+ doping on the X-ray diffraction, magnetic and electric transport properties of the mixed valence perovskites $La_{0.67}Ba_{0.33-x}Rb_xMnO_3$ ($0 \le x \le 0.1$), prepared by the flux technique. X-ray diffraction and structure refinement showed the formation of single-phase compositions with rhombohedral symmetry with $R\bar{3}c$ space group. Magnetization measurements in a magnetic field of 0.05 T confirm a transition from ferromagnetic (FM) to paramagnetic (PM) phase with increasing temperature. The Curie temperature T_C decreases from 340 K (x = 0) to 296 K (x = 0.1). The decrease of T_c can be explained by the Mn^{4+} content increase. Upon Rb doping, the temperature T_{M-Sc} decreases, in accordance with the evolution of T_C values (from 340 to 296 K). The electrical resistivity concluded that the metallic part (below T_{M-Sc}) can be explained by the following equation $\rho(T) = \rho_0 + \rho_2 T^2 + \rho_{4.5} T^{4.5}$, signifying the importance of the domain boundary / grain, combination of electron-magnon, electron-electron and electron phonon scattering processes. At higher temperature ($T > T_{M-Sc}$) the semiconducting regime, the adiabatic small polarons hopping mechanism (ASPH) was found to fit well.

Keywords: Perovskite; A-site substitution; manganite, magneto-transport.