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Magnetic, structural and magneto-resistance studies of doped $LaMnO_3$ bulk samples prepared by citrate combustion process HIMANI KHANDURI, MUKESH CHANDRA DIMRI, National Institute of Chemical Physics and Biophysics, Tallinn-12618, Estonia, ARVO MERE, VALDEK MIKLI, JÜRI KRUSTOK, Tallinn University of Technology, Tallinn- 19086, Estonia, RAIVO STERN, National Institute of Chemical Physics and Biophysics, Tallinn-12618, Estonia — We present the structural and magnetic properties of polycrystalline samples of $La_{0.95}A_{0.05}MnO_3$ (where A = Na, Sr, Er, Dy and Ce) prepared by chemical citrate combustion method. Er substituted samples ($La_{1-x}Er_xMnO_3$ with x = 5, 10, 20 and 30%) were also investigated, because their studies lack in the literature. The pervoskite structure was confirmed from X-ray diffraction and Raman spectra in these doped samples, excluding higher Er substituted samples (x > 0.1). The grain sizes were around 2-3 micrometres for all of the sintered samples (at 1300°C), whereas it was below 100 nm for the powders calcined at 600°C, determined from the SEM images. Curie transition temperatures in those doped LMO bulk samples were found to be around 250K, which is higher than the ideal value (∼140 K) for undoped samples. The increase in the Curie temperature can be related to non-stoichiometry and cation vacancies created due to higher/lower valence substitutions for trivalent La^{3+} ions. The temperature dependence of resistivity also confirms the MIT transition in some of these samples.

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