The effect of Ti substitution in Mn sites on the structural and electrical properties of La$_{0.8}$Sr$_{0.2}$MnO$_3$ manganite

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Abstract
In this study, the effect of Ti substitution on structural and electrical properties of La$_{0.8}$Sr$_{0.2}$Mn$_{1-x}$Ti$_x$O$_3$ (0 ≤ x ≤ 0.075) compounds have been investigated. The double exchange interaction mechanism weakens by substituting the nonmagnetic Ti$^{4+}$ ions in Mn$^{4+}$ and Mn$^{3+}$ sites. The results show that with increasing the doping level, metal-insulator transition temperature shifts to lower temperatures and electrical resistivity increases. Also at higher sintering temperature, lattice parameters and unit cell volume increases regularly but resistivity decreases. Electrical resistivity reduction is due to the decreasing of the grain boundary resistivity. Electrical resistivity behavior of samples is in a good agreement with small polaron hopping (SPH) model.

Keywords: manganite, Ti doping, electrical resistivity, small polaron hoping

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