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ELECTRICAL TRANSPORT PROPERTIES OF $La_{0.67}(Sr_{1-x}Ba_x)_{0.33}Mn_{0.9}Ti_{0.1}O_3$ PEROVSKITE MANGANITE

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ABSTRACT

Influence of Ba doping on the structure and electrical transport properties of polycrystalline $La_{0.67}(Sr_{1-x}Ba_x)_{0.33}Mn_{0.9}Ti_{0.1}O_3$ ($0 \leq x \leq 1.00$) perovskite manganites were studied. The samples synthesized by solid-state reaction method experience a transformation from *R-3C* rhombohedral to *Pm3m* cubic structure with the increment of Ba concentration. Temperature dependent resistivity showed that the metal-insulator transition temperature decreases from 117 K to 60 K with increasing Ba content up to x = 0.75. The low temperature resistivity below the metal-insulator transition temperature, T_p was well fitted with the $\rho = \rho_o + \rho_2 T^2$ equation indicating the contribution of domain or grain boundary mechanisms and the electron-electron scattering mechanism in the conduction. Contrary to that, in the high temperature insulating regime ($T > T_p$), the resistivity follows variable range hopping (VRH) and small polaron hopping (SPH) conduction mechanisms.

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