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Bibliographic Information

Effect of A-site ionic radii on the magneto-transport properties in $(\text{La}_x\text{Sm}_{1-x})_{2/3}\text{Sr}_{1/3}\text{MnO}_3$ ($x = 1/3, 1/2$ and $2/3$) manganites.

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Abstract

The magnetic and transport properties of $(\text{La}_x\text{Sm}_{1-x})_{2/3}\text{Sr}_{1/3}\text{MnO}_3$ ($x = 1/3, 1/2$ and $2/3$) manganites, prepd. by the citrate-gel route, have been investigated. These compds. are found to crystallize in the orthorhombic structure. The hopping between Mn³⁺ and Mn⁴⁺ sites is controlled by Mn-O-Mn bond angle. The percentage of max. magnetoresistance in 8.5 kOe fields varies from 15 to 25 percentages over the temp. range 300 K to 80 K. The metal-insulator as well as magnetic transition temps. are close to each other which indicates the presence of long-range ferromagnetic ordering in the present system. The ferromagnetic to antiferromagnetic transition at low temp. is obsd. due to competing superexchange and double exchange interactions. The max. magnetic moment at 5 K, for all the samples is .apprx.3.6 μ_B/Mn , which is close to the 3.7 μ_B/Mn , as obtained by considering the Mn spins only. The conduction mechanism could be understood by correlated small polaron model.