Magneto-electrique and magnetic studies of the Sr-doped Samarium manganite synthsesed by citrate gel method.

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Abstract : In This paper we report study the effect of sintering temperature on the magnetotransport properties of Sm1-xSrxMnO (with x=0.3) manganite syntesized by citrate gel method. The Sm30.7Sr0.3MnO has been sintered at 700C (SSM7), 900C (SSM9) and 1300C (SSM13). XRD confirms that phase formation starts at 700C. All the samples are single phasic having orthorhombic unit cell. The lattice parameters decrease on lowering the sintering temperature. The crystallite as well asparticle size also show strong dependence on the sinteringtemperature. All the samples possess insulator-metal (TIM) aswell as paramagnetic-ferromagnetic (TC) transitions. The TCshows a small variation [274K to 256K]. The temperature causes a great increase of resistivity and lowers the temperature of the metal-insulator transition T3. Under applied magnetic field, a significant reduction in the resistivity and a shift of TP to higher temperatures values are observed. In the insulating region(T>T), the resistivity curves are well fitted by the small polaron hoping mechanism while in the metallic region (T<TP), the simple model of small hopping of spin-polarons is used. Some physical parameters are extracted. The highest obtained magnetoresistance MR values is about 34.32% at 0.5 Tesla for for SSM13.

Keywords : manganite, citrate, magnetotransport, Structure.