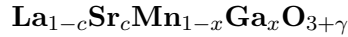


Defect Structure and Nonlinear Electrical Properties of Manganites



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Regularities of the influence of Ga and oxygen concentrations on the defect structure of bulk manganites $\text{La}_{1-c}\text{Sr}_c\text{Mn}_{1-x}\text{Ga}_x\text{O}_{3+\gamma}$ ($c=0.15, 0.17, 0.19; 0.025 \leq x \leq 0.125$) were established by using powder X-ray diffraction, modified method of unit cell volume calculation, the data on saturation magnetization, Curie point and resistivity. Structural formulae of manganites were derived. The samples synthesized at 1473 K in air had rhombohedral structure and $\gamma > 0$. In order to provide stoichiometric oxygen content, the samples were annealed at 1223 K and partial pressure of oxygen 10^{-1} Pa. After annealing, some samples contained the mixture of rhombohedral and orthorhombic phases. It was found that manganites reveal negative-resistance behavior at low temperatures. Synthesized samples with $c=0.15, x=0.125$ exhibit *N*-type multi-peak current-voltage (*I-V*) characteristics, and the steepness of current growth as a function of *V* increases with temperature in the interval 113-133K. There are also the regions where little dependence *I(V)* takes place. The shape of current-voltage characteristics depends sensitively on the concentration of cation vacancies. Multi-peak negative-resistance behavior of manganites can be ascribed to transformation of energetic level structure and of carrier concentration in energy bands under the influence of threshold field.

9.7 cm

13.4 cm

Subject category :

4. Spin Electronics and Magneto-Transport

Presentation mode :

poster

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