CORRELATION BETWEEN MAGNETIC PHASES AND INSULATOR-METAL TRANSITION IN $La_{1/3}Nd_{1/3}Ca_{1/3}MnO_3$ PEROVSKITE

J. Baszyński, B. Idzikowski, T. Toliński, A. Hoser[a]
Institute of Molecular Physics, Polish Academy of Sciences, Poznań, Poland
[a]Hahn-Meitner-Institut, Berlin, Germany

9.7 cm

Doped perovskite manganese systems exhibit colossal magnetoresistance effect and divers types of magnetic order. The insulator-metal transition has been generally interpreted in the framework of the double exchange model, which arises from the mixed valency of Mn ions. A crossover from a small to a large polaron regime at ordering temperature is also possible. The aim of our work is to verify the correlation between temperatures of the magnetic phase transitions (ferromagnetic/antiferromagnetic) and the resistivity behaviour, i.e. semiconductor (or insulator) - metal transition in the $La_{1/3}Nd_{1/3}Ca_{1/3}MnO_3$ perovskite prepared by the standard ceramic method. The neutron diffractograms and resistivity are investigated in the temperature range from 280K down to 5K. We assume that lowering the temperature increases the domains with ferromagnetic ordering, therefore they get into contact, which is accompanied by the peak in resistivity. We have found that the area of the antiferromagnetic peaks was growing with decreasing temperature and reached the maximum at temperature about 20K lower than in resistivity measurements and did not vanish at 5K.

13.4 cm

Subject category :

4. Rare Earths and Actinides, Alloys and Compounds

Presentation mode :
poster

Corresponding author :
J.Baszyński

Address for correspondence :
Institute of Molecular Physics
Smoluchowskiego 17, 60-179 Poznań, Poland
Fax: (48-61) 8684 -524

Email address :
jbasz@blanka.ifmpan.poznan.pl