SLOW RELAXATION OF RESISTIVITY IN MANGANITE PEROVSKITE NANOCONSTRICTIONS

J.Baszyński
Institute of Molecular Physics 60-179 Poznań

9.7 cm

We have investigated a significant time resistivity relaxation in the perovskite nanoconstrictions (PNC) obtained by break technique at LN. The time t dependence the resistivity R of the PNC has been measured by computer devices at several temperatures, between LN and 370 K. The relaxation effects of R vs. t can be described by two-term formula: stretched exponential function + logarithmic one can describe a slower relaxation processes - the relaxation times values are about few seconds. The appearance of both contributions evidences the existence of two sources of relaxation, which can be assigned to inhomogeneous changes of the angle between the magnetic moments of the neighbouring Mn ions at different "spin blocks" of PNC. Due to the close relation between resitivity and the magnetization in manganese compounds, according to Zener model, the R (t) measurements provide an excellent indirect method to characterize the magnetic relaxation. The magnetic relaxations are dependent of the basis current flowing trough the PNC. The magnetic viscosity coefficient S of the PNC displayed characteristic like bell-shaped curves vs. basis current. These results point out the important role of structural arrangements of the Mn-ions clusters on the surfaces of the tip and target, respectively. In conclusion, the measurements time decay of the resistance, these relaxations are due to change of the magnetic correlation between Mn^{3+} and Mn^{4+} ions, are excellent indirect method for characterizing the magnetic relaxation in perovskite atomic scale constrictions.

13.4 cm

Subject category :

5. Nano-structure, Surfaces, and Interfaces

Presentation mode :
poster

Corresponding author :
J.Baszyński

Address for correspondence :
Institute of Molecular Physics
60-179 Poznań
Smoluchowskiego 17

Email address :
jbasz@ifmpan.poznan.pl