

BS10

Magnetic Memory Effect in a Strong Phase Competition System - $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{0.925}\text{Ti}_{0.075}\text{O}_3$

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A magnetic memory effect was observed by means of ZFC magnetization measurements in the temperature range below T_c . The amplitude of the magnetic memory effect determined as the difference between the magnetization curve with the pause of temperature and its reference, showed that it is independent of the number of pauses. The memory effect is supposed to be related to the "infinite" number of states, which is associated with the presence of magnetic frustration in a system with a strong magnetic phase competition. Besides, a resistance memory effect was concomitantly observed at the same pause temperatures.

Keywords : CMR, Frustration system, Magnetic phase competition

BS11

Synchrotron-radiation Study of Valence States and Electronic Structures of $\text{AgNi}_{1-x}\text{Co}_x\text{O}_2$ Delafossite Oxides

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The delafossite structure of ABO_2 can be described as the alternating stacking of BO_2 slabs and O-A-O dumbbell-shaped layers along the c axis [1]. Both A and B cations as well as O anions in each layer form the triangular sublattices, and the BO_2 slab is comprised of the edge-shared BO_6 octahedra. Most of Ag-based AgTO_2 delafossite oxides are semiconductors (T: transition-metal ion), and AgTO_2 delafossite oxides usually reveal the antiferromagnetic coupling with spin frustrations due to the triangular network of T ions. Interestingly, AgNiO_2 is an antiferromagnetic metal, while AgFeO_2 and AgCoO_2 are nonmagnetic insulators. A compositionally controlled metal-insulator transition (MIT) has been observed in $\text{AgNi}_{1-x}\text{Co}_x\text{O}_2$ with increasing x [2]. In order to understand the origin of the different physical properties in AgTO_2 (T=Co, Ni) and the MIT in $\text{AgNi}_{1-x}\text{Co}_x\text{O}_2$, we have investigated the electronic structures of $\text{AgNi}_{1-x}\text{Co}_x\text{O}_2$ ($0 \leq x \leq 1$) using soft x-ray absorption spectroscopy (XAS) and soft x-ray photoemission spectroscopy (PES). Polycrystalline $\text{AgNi}_{1-x}\text{Co}_x\text{O}_2$ samples were prepared by the cation-exchange reaction method. The Co and Ni 2p XAS measurements show that Ni ions are in the Ni^{2+} - Ni^{3+} mixed-valent states and that the low-spin Ni^{3+} component increases with x while Co ions are in the low-spin Co^{3+} states for all x in $\text{AgNi}_{1-x}\text{Co}_x\text{O}_2$. A good agreement is found between the measured PES spectra and the calculated electronic structures of AgTO_2 (T=Co, Ni). This study suggests that mixed-valent Ni ions play an important role in determining the MIT in $\text{AgNi}_{1-x}\text{Co}_x\text{O}_2$.

REFERENCES

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