BR05

Electronic Transport and Magnetic Properties in $Y_{0.125}Ca_{0.875}MnO_3$ Perovskites

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Polycrystalline samples of $Y_{0.125}Ca_{0.875}MnO_3$ has been prepared. We have systematically examined the structure, electronic transport, magnetoresistance, and magnetization behaviors in the system. The XRD result shows a single phase of orthorhombic structure with calculated lattice parameters $a = 5.31$ Å, $b = 7.48$ Å, and $c = 5.28$ Å, which is O-type phase ($c < b/\sqrt{2}$) in space group *Pnma*(62) specifically [1]. The electrical transport and magnetization properties of $Y_{0.125}Ca_{0.875}MnO_3$ were measured at the temperature and magnetic field ranges from 4.2 to 300 K and 0 to 8T. An unusual MR effect was observed in $Y_{0.125}Ca_{0.875}MnO_3$. Especially, an enhanced magnetoresistance effect was obtained in $Y_{0.125}Ca_{0.875}MnO_3$ at low temperatures. From the magnetization in the zero-field-cooled (ZFC) and field-cooled (FC), a large irreversibility was observed with a cusp $T_f = 108$ K about at ZFC magnetization, which coincides well with the cusp seen in AC susceptibility curve considered as spin-glass freezing temperature T_{sg}. With the electronic transport and magnetic properties in $Y_{0.125}Ca_{0.875}MnO_3$, we considered an intrinsic ferromagnetic spin-glass (FSG) state in the system at low temperatures [2, 3, 4, 5, 6, 7].

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BR06

Magnetic Anisotropy in $LuFe_2O_4$ Single Crystal

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$LuFe_2O_4$ was recently found to exhibit ferroelectricity associated with the charge order leading to Fe^{2+} and Fe^{3+} ions [1]. The subsequent discovery of a giant magneto-dielectric effect at room temperature suggested a direct potential for applications of this material [2]. Magnetic order appears below 240 K and 3D ferrimagnetic order has been suggested by neutron scattering studies [3]. In order to understand the magnetic anisotropy, we have investigated the magnetic properties of single crystal $LuFe_2O_4$. Single crystals of $LuFe_2O_4$ were grown by floating zone-melting using a CO/CO_2 mixture. Figure 1 shows the thermo-magnetization curves of $LuFe_2O_4$ single crystal in 100 Oe. The square and circle symbols show those of the parallel and perpendicular direction, respectively. The field-cooling effect is observed in the both directions below 220 K where the magnetization has a peak, while much smaller magnetization is induced in the perpendicular direction.

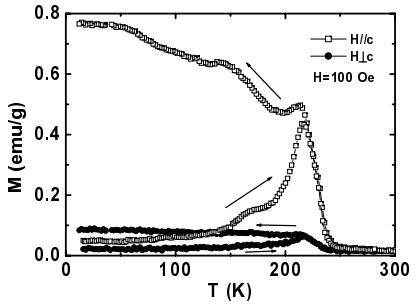

Fig. 1. Temperature dependence of magnetization for $LuFe_2O_4$ in 100 Oe.

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