## **BR05**

# Electronic Transport and Magnetic Properties in Y<sub>0.125</sub>Ca<sub>0.875</sub>MnO<sub>3</sub> 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].

This work is supported by the NSFC (No. 10574087), the Natural Science Foundation of Henan (No. 082300440080), and the Basic Research Plan on Natural Science of the Education Department of Henan Province (No.2008A140014).

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## **BR06**

# Magnetic Anisotropy in LuFe<sub>2</sub>O<sub>4</sub> 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.

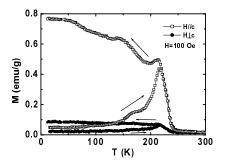


Fig. 1. Temperature dependence of magnetization for LuFe<sub>2</sub>O<sub>4</sub> in 100 Oe.

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