

## Crystal Structure, Electrical and Magnetic Properties of Perovskites $\text{La}_{0.5}\text{Sr}_{0.5-x}\text{Ba}_x\text{CoO}_3$ ( $x = 0.0$ and $0.25$ )

H. J. Kim<sup>a</sup>, W. K. Choo<sup>a</sup> and C. H. Lee<sup>b</sup>

<sup>a</sup>Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, 373-1 Gusong-Dong, Yusong-Gu, Taejon, Korea

<sup>b</sup>Neutron Physics Department, Hanaro Center, Korea Atomic Energy Research Institute, Taejon, Korea.

### **Abstract**

*The resistivity and magnetization of  $\text{La}_{0.5}\text{Sr}_{0.5-x}\text{Ba}_x\text{CoO}_3$  ( $x = 0.0$  and  $0.25$ ) system have been investigated. The resistivity of  $\text{La}_{0.5}\text{Sr}_{0.5-x}\text{Ba}_x\text{CoO}_3$  has increased with Ba substitution. Magnetization curves of  $\text{La}_{0.5}\text{Sr}_{0.5-x}\text{Ba}_x\text{CoO}_3$  ( $x = 0.0$  and  $0.25$ ) have showed the large difference between field cooled  $M_{FC}$  and zero field cooled  $M_{ZFC}$  below  $T_c$ . X-ray and neutron diffraction measurements have been also performed. The crystal structure of  $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_3$  at room temperature is rhombohedrally distorted perovskite belonging to the space group  $R\bar{3}c$  (No. 167) with the  $a^-a^-a^-$  type tilt system. From the results of powder X-ray and neutron Rietveld analysis, it is demonstrated that the lattice parameter along the  $a$ -axis increases and the rhombohedral angle decreases with the Ba substitution. It is also shown that the octahedral tilting becomes smaller with the Ba substitution.*