

N92-21610

Thermal and electric properties of
 $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_{4-y}$ and $\text{Pr}_{1.85}\text{Ce}_{0.15}\text{CuO}_{4-y}$

Z.S.Lim^a, K.H.Han^b, Sung-Ik Lee^{a,b}, Yoon H. Jeong^{a,b},
aPhysics Division, Research Institute of Industrial Science and
Technology, Pohang, 790-330, Korea bDepartment of Physics, Pohang
Institute of Science and Technology, Pohang, 790-330, Korea;
Y.S.Song, Y.W.Park Department of Physics, Seoul National
University, Seoul, 151-742, Korea

Electric resistivity, magnetic susceptibility, thermoelectric power, and Hall coefficient of $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_{4-y}$ and $\text{Pr}_{1.85}\text{Ce}_{0.15}\text{CuO}_{4-y}$ whose onset temperature of the superconductivity are 24 K and 23 K were measured. Our experimental results show many interesting features. In particular, the Hall coefficients are negative and relatively flat as a function of temperature. However, the temperature dependence of the thermoelectric power (TEP) for these two samples shows the positive sign for both samples in contrast to the previous results. Moreover TEP for both samples remains flat in the normal state below 250 K, but decreases rapidly above 250 K. TEP of only $\text{Pr}_{1.85}\text{Ce}_{0.15}\text{CuO}_{4-y}$ shows a peak near 50 K. Finally onset temperatures of sudden drop of TEP are higher than those of resistance drop.

We also measured the physical properties of these samples produced at different conditions such as different heat treatment temperatures, atmospheres. TEP and resistance measurement show that oxygen deficiency is essential to produce better superconducting samples. Correlation between TEP and superconductivity for these different samples will be discussed.