

Annealing and Doping Effects of 1D Cuprates Investigated by Thermal Conductivity and Optical Conductivity Measurements

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Low-dimensional quantum spin system is expected to have a large contribution to the thermal conductivity due to strong spin fluctuations. In fact, there are a few reports which show that one-dimensional (1D) insulating spin-ladder system $\text{La}_6\text{Ca}_8\text{Cu}_{24}\text{O}_{41}$ show the thermal conductivity is peaked at fairly high temperature along ladder structure¹². The maximum value is comparable to that in typical metallic materials, and the thermal conductivity decreases with carrier doping. Sr_2CuO_3 and SrCuO_2 belong to the members of 1D spin ($S=1/2$) systems and have a one-dimensional single and a zigzag chain structure, respectively. A recent result has shown that the thermal conductivity of SrCuO_2 is also large but sensitive to oxygen content and density of impurity phases³. We have investigated both thermal conductivity and optical conductivity for these 1D cuprates in order to clarify the effect of oxygen nonstoichiometry and carrier doping.

¹C.Hess *et al.*, Phys. Rev. B **64**, 184305 (2001)

²K.Kubo *et al.*, J. Phys. Soc. Jpn **70**, 437 (2001).

³T.Kawamata *et al.*, arXiv:1103.1694