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The Effect of Potassium Doping on Resistive Transitions and Transport Critical Current of Bulk YBCO high-T<sub>c</sub> Superconductors

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**Abstract:** We report on observations of the effect of potassium in YBCO (123) high temperature superconductors with nominal composition  $Y_{1-0.2x}Ba_{2-0.2x}K_xCu_3O_y$ . The electrical resistivity measurements show that the critical temperature  $T_c$  ( $R=0$ ) shifted slightly to lower temperature due to the K doping process. This process also decreases the transport critical current density and the activation energy for thermally activated flux flow. The magnetic field dependence of  $j_c$  was measured at 77 K after zero field cooling (ZFC) when the applied magnetic field is impressed (ZFCV) and removed (ZFCD). The results are discussed in terms of "return" magnetic flux density associated with the magnetization of the grains. Activation energy was determined from the Arrhenius resistivity plot versus temperature curve. The XRD patterns are also presented for sample characterization.

**Key Words:** High-T<sub>c</sub> superconductors, K-doping, critical current density, resistive transition

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