Superconducting Properties of Boron-doped Eu-123 HTSs

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Nominally pure and B2O3-added Eu-123 HTSs with nominal composition EuBa2Cu3BXOy (x=0, 0.03 and 0.05) were prepared by the solid state reaction method. The influence of boron-doping was studied using X-ray diffraction (XRD), resistivity and AC susceptibility measurements. Only reflection peaks corresponding to orthorhombic structure of Eu-123 phase were observed in the XRD patterns for both pure and B-doped samples. For the undoped specimen zero resistivity is reached at Tc=91K. Critical temperature gradually decreases with increasing a doping level and drops to 85K at x=0.05. The measurements of the real and imaginary parts of AC susceptibility indicate that boron-doping leads to the decrease of critical temperature and marked deterioration of connectivity between the superconducting grains.

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