

Transport Current Dependence of Critical Magnetic Field in
Polycrystalline Samples of High-Temperature Superconductor
(RE) $\text{Ba}_2\text{Cu}_3\text{O}_{7-x}$, where RE = Y, Er, and Yb:

The transport current dependence of the critical magnetic field has been investigated at temperature of 78K and 68K in bulk polycrystalline samples of the high-temperature superconductor (RE) $\text{Ba}_2\text{Cu}_3\text{O}_{7-x}$, where RE (Rare Earth) = Yttrium (Y), Erbium (Er), and Ytterbium (Yb). Samples were sintered in pellet form after the conventional ceramic processing techniques, and rectangular slabs were then cut for these four-probe measurements. A 2-Tesla magnet was used to provide the magnetic field. Critical temperatures (onset) for these samples were measured as Y (90K), Er (89K), and Yb (89K) using the standard four-probe technique. We find that the critical field is much more current-sensitive in the Y- and Er-samples than in the Yb-sample. A dramatic temperature effect is seen in all three samples, but most notably in the Yb-sample.