Properties of $YBa_2Cu_3O_y$-textured superconductor foams

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Abstract

Using the combination of standard ceramic processing and an infiltration technique, Y123 superconductor foams have been successful elaborated. In this report we present first magneto-transport measurements of the superconducting properties of these foams. The investigations reveal that the superconducting properties are close to those of textured bulk melt processed materials. The foams exhibit a T_c of 92 K and a magnetization J_c of 40,000 A/cm^2 at 77 K and 0 T. The magnetic hysteresis vs. field measurements show a high anisotropy of the critical current density up to $J_c^{ab}/J_c^{c} \sim 7$, in good agreement with the quite surprising observation of a strong texture stabilisation as seen from neutron diffraction measurements.