The Effect of Magnetic Nanoparticles Addition on The Superconducting Properties of Bi1.6Pb0.4Sr2Ca2Cu3O Superconductors

ABSTRACT

Sm2O3 nanoparticle was added to Bi-2223 superconductor prepared by solid state reaction technique with intermediate grinding. A stiochiometric precursor of x=0.00-0.05 Sm2O3 nanoparticle is systematically added to the well balanced Bi1.6Pb0.4Sr2Ca2Cu3Oδ in order to trace the effect of nanoparticles addition to the system. Microstructure, resistive transitions, phase volume, and cell parameters were hence investigated. Addition of Sm2O3 nanoparticle is found to slowly decrease the Bi-2223 phase volume and the resistive transitions for x=0-0.02 samples whereas accelerated formation of the Bi-2212 phase is detected for further additions. Changes in superconducting properties of Sm-added Bi-2223 system were discussed and the findings were further compared with available literature

Keyword: Superconductor, Nanoparticle, Addition