Turkish Journal

of

Physics

# Turkish Journal of Physics

## A Novel Technique for the Preparation of Textured $YBa_2Cu_3O_{7-\delta}$ Superconductor

Naheed KAUSAR, Saadat Anwar SIDDIQI
Centre of Excellence in Solid State Physics,
University of the Punjab, Quaid-e-Azam Campus, Lahore-54590-PAKISTAN
Asghari MAQSOOD
Department of Physics, Quaid-e-Azam University, Islamabad-PAKISTAN}

Keywords
Authors

phys@tubitak.gov.tr

Scientific Journals Home Page

**Abstract:** Textured samples having composition of $YBa_2Cu_3O_{7-\delta}$ were prepared by using a novel technique of heating the samples in a thermal gradient which varies linearly between 930-950 $^oC$ over a distance of 5 cm. The samples were characterized by X-ray powder diffraction analysis, temperature dependent resistivity and magnetic susceptibility measurements, and scanning electron microscopy. XRD analysis shows that sample heated between 930-935 $^oC$ has tetragonal symmetry and all other three samples show orthorhombic symmetry. Samples heated in temperature gradient of 935-945 $^oC$ aligned along the c-axis. The orthorhombic samples exhibited zero resistance above 86K with short transition width and samples heated in the temperature range of 930-935 $^oC$ was non-superconducting down to 80 K. Susceptibility measurements also confirms the same $T_c$ values for the superconducting samples. The orientation of crystals and alignment of grains was observed by SEM images and investigated by XRD patterns. The maximum texture alignment of the $YBa_2Cu_3O_{7-\delta}$ superconducting grains is obtained in a thermal gradient of 935-945 $^oC$.

Turk. J. Phys., **25**, (2001), 53-62.
Full text: pdf
Other articles published in the same issue: Turk. J. Phys.,vol.25,iss.1.