THE STUDY ON CRITICAL TEMPERATURE OF YBCO (YTTRIUM BARIUM COPPER OXIDE) SUPERCONDUCTOR UPON DOPING OF CeO_2 (CERIUM OXIDE) NANOPARTICLE

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ABSTRACT

THE STUDY ON CRITICAL TEMPERATURE OF YBCO (YTTRIUM BARIUM COPPER OXIDE) SUPERCONDUCTOR UPON DOPING OF CeO_2 (CERIUM OXIDE) NANOPARTICLE.

This experiment was conducted to determine the critical temperature of $YBa_2Cu_3O_\partial$ superconductor doped with CeO_2 (cerium oxide). The samples with varying value of Y (x = 0.00 wt%, 0.02 wt% and 0.05 wt %) were prepared by using solid state method. The samples characterization were done by using four point probe analysis obtaining the critical temperature for each sample. By this, current will be passed through the prepared samples and the resistance and temperature value was recorded. The resistance as well as the derivative of the resistance as a function of temperature was analyzed in order to determine the specific value of critical temperature for each sample. This particular experiment yielded Tc values of YBCO superconductor which were 82.5 K, 79.2 K and 77.3 K for x = 0.00 wt%, x = 0.02 wt% and x = 0.05 wt% respectively. The critical temperature of pure sample, x = 0.00 was found to be 82.5 K, an 11.3% difference from the accepted value of 93 K.

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