PREPARATION AND CHARACTERIZATION OF YTTRIUM BARIUM COPPER OXIDE (YBCO) SUPERCONDUCTOR WITH ADDITION OF COBALT OXIDE (Co_3O_4)

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This Final Year Report entitled **"Preparation and Characterization of Yttrium Barium Copper Oxide (YBCO) Superconductor with addition of Cobalt Oxide, Co_3O_4"** was submitted by Nor Erwana binti Yunus, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

PREPARATION AND CHARACTERIZATION OF YTTRIUM BARIUM COPPER OXIDE (YBCO) SUPERCONDUCTOR WITH ADDITION OF COBALT OXIDE (Co_3O_4)

This study was carried out to study the electrical properties of YBCO sample as superconductor and the effect of addition of Co_3O_4 on the superconducting properties of YBCO superconductor. The YBCO sample was prepared by solid state reaction route. The samples were prepared by each with weight percentage of cobalt oxide of x= 0.00, x= 0.01, x= 0.02 and x= 0.03. Two calcination temperatures were carried out at 900°C for 24 hours. Final sintering was carried out at 920°C for 24 hours. Electrical Conduction by Multimeter, Fourier Transform Infrared (FTIR), Critical temperature (T_c) measurement, X-ray Diffraction (XRD), and Scanning Electron Microscopy (SEM) were conducted for analysis. Multimeter showed all samples were in electric conduction, FTIR showed the sample was removed carbonyl compound after calcination, T_c measurement showed that the sample of x= 0.02 was increased critical temperature rather than sample of x= 0.00, XRD showed all samples have orthorhombic structure and SEM showed that the grain size was increased as increased the cobalt in YBCO superconductor. Besides, the EDX also showed the composition of elements YBCO were tally with chemicals used for pure YBCO and addition cobalt oxide into YBCO superconductor.