

**THE FLUX PINNING PROPERTIES OF YTTRIUM
SUBSTITUTION IN Bi-2223 SUPERCONDUCTOR**

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**Final Year Project Report Submitted in Partial Fulfillment of the
Requirement for the Degree of Bachelor of Science (Hons.) Physics in
the Faculty of Applied Sciences
Universiti Teknologi MARA**

JULY 2017

ABSTRACT

THE FLUX PINNING PROPERTIES OF YTTRIUM SUBSTITUTION IN Bi-2223 SUPERCONDUCTOR

This report present the study of flux pinning properties as well as the superconducting properties of $\text{Bi}_{1.6-x}\text{Y}_x\text{Pb}_{0.4}\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}$ superconductor. The samples with varying value of Y ($x = 0.00, 0.02, 0.05, 0.10$ and 0.20) were prepared by using solid state method. The samples were characterized by using four point probe and X-ray diffraction (XRD). The critical temperature, T_c and critical current density, J_c measurement were done using four point probe method without applied magnetic field. Pure sample ($x = 0.00$) was observed to have the highest value of T_c and J_c . The $T_{c(\text{onset})}$ and $T_{c(\text{zero})}$ for pure sample are 111 K and 97 K respectively. The J_c value for pure sample is 1.590 A/cm^2 at temperature 40 K. The flux pinning properties were observed using four point probe method with applied magnetic field varying from 0.00T to 0.33T. The J_c -B characteristic show that pure sample has better flux pinning properties compared to other samples and has the better peak position of $F_p/F_{p\text{max}}$ in the magnetic field. The XRD pattern shows that all samples exhibit orthorhombic structure and peak at $2\theta = 26^\circ$ is being diminished at $x = 0.10$ and 0.20 . From the results, it is show that yttrium substituted samples reduced the superconducting properties and as well as the flux pinning properties of the Bi-2223 superconductor.

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