

THE ROLE OF ANTIMONY (Sb) ADDITION ON BSCCO SUPERCONDUCTOR

H. Azhan, K. Azman and S. Y. S. Yusainee

Universiti Teknologi Mara Pahang

26400 Bandar Jengka, Pahang

ABSTRACT

The effect of Sb doping on 2223 phase of BSCCO system has been studied via XRD and resistance measurement to determine its crystalline structure and critical temperature, T_C respectively. Generally, all samples exhibit metallic behaviour above $T_{C\text{ onset}}$. The value of zero resistance temperature, $T_{C(R=0)}$ decreased as the content of Sb increased except for sample $x = 0.2$ that shows the improvement of $T_{C(R=0)}$ by 4 K. This value was compared to that of the pure sample (Sb-free). The Sb_2O_3 was incorporated into the crystalline structure of BSCCO system since no peaks belong to this oxide was detected in XRD pattern. Samples with Sb content of $x \leq 0.3$ were dominated with 2223 phase while other samples ($x > 0.3$) were dominated with 2212 phase. All samples remain in tetragonal form which is $a = b \neq c$. The length of c-lattice that plays an important role of superconducting properties was found to decrease and hence contract the volume of unit cell as the content of Sb increased.

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