ABSTRAK

VARIASI SUHU SINTERING DALAM SINTESIS SUPERKONDUKTOR Bi-2212 DENGAN DOPING Pb (BPSCCO-2212) PADA KADAR Ca=1,10

Oleh

MELI RATNA SARI

Bahan superkonduktor BPSCCO-2212 dengan kadar $CaCO_3$ 1,10 fraksi mol telah disintesis dengan metode reaksi padatan (*solid state reaction method*). Sintesis dilakukan selama 10 jam pada suhu kalsinasi (Tk) 800^{o}C dan sintering selama 20 jam dengan variasi suhu (Ts) 815^{o}C, 820^{o}C, 825^{o}C, dan 830^{o}C. Tujuan penelitian untuk mengetahui pengaruh variasi suhu sintering terhadap tingkat kemurnian fase superkonduktor Bi-2212 yang terbentuk (fraksi volume (Fv), derajat orientasi (P), dan impuritas (I)). Hasil sintesis dikarakterisasi menggunakan XRD (*X-Ray Diffraction*) dan SEM (*Scanning Electron Microscopy*). Hasil analisis XRD menunjukkan variasi suhu sintering cenderung meningkatkan fraksi volume (Fv). Fraksi volume (Fv) pada Ts=815°C diperoleh 72,39%, Ts=820°C diperoleh 74,56%, Ts=825°C diperoleh 87,34%, dan Ts=830°C diperoleh 90,10%. Sedangkan derajat orientasi (P) pada Ts=815°C diperoleh 53,13%, Ts=820°C diperoleh 55,97%, Ts=825°C diperoleh 59,31%, dan Ts=830°C diperoleh 42,43%. Fraksi volume (Fv) relatif baik pada sampel yang disintering dengan Ts= 830°C yaitu 90,10%. Sedangkan derajat orientasi (P) relatif baik pada sampel dengan Ts=825°C yaitu 59,31%.

Kata kunci: superkonduktor, BPSCCO-2212, suhu sintering, fraksi volume, derajat orientasi.

ABSTRACT

VARIATION OF SINTERING TEMPERATURE IN THE SYNTESIS OF Bi-2212 SUPERCONDUCTOR WITH Pb DOPANT (BPSCCO-2212) ON THE CONTENT OF Ca=1,10

By

MELI RATNA SARI

Synthesis of BPSCCO-2212 superconducting materials with $CaCO_3$ 1,10 mole fraction has been done using solid reaction method. Synthesis conducted with calcination for 10 hours at temperature of 800^{o}C and sintering for 20 hours with sintering temperature variations (Ts) 815^{o}C, 820^{o}C, 825^{o}C, dan 830^{o}C. Sintering temperature variation was performed to determine the effect on the level of purity of the Bi-2212 superconducting phase is formed (volume fraction (Fv), the degree of orientation (P), and impurity (I)). The samples were characterized using XRD (X-Ray Diffraction) and SEM (Scanning Electron Microscopy). XRD analysis results showed variation of sintering temperature tended to increase the value of the volume fraction (Fv). Value of the volume fraction (Fv) on Ts=815°C obtained 72,39%, Ts=820° C obtained 74,56%, Ts=825°C obtained 87,34%, and Ts=830°C obtained 90.10%. While the value of the degree of orientation (P) at Ts=815°C obtained 53,13%, Ts=820°C obtained 55,97%, Ts=825°C obtained 59,31%, and Ts=830°C gained 42,43%. Volume fraction (Fv) is relatively well contained in sintering samples at temperatures 830°C is 90,10%. While the degree of orientation (P) is relatively well contained in the sample with Ts=825°C was 59,31%.

Key words: superconductors, BPSCCO-2212, sintering temperature, volume fraction, the degree of orientation.