

## ABSTRAK

### PENGARUH DOPING Pb TERHADAP PERTUMBUHAN FASE BAHAN SUPERKONDUKTOR Bi-2212 PADA KADAR Ca 1,10 DAN SUHU SINTERING 830°C

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Penelitian tentang pengaruh doping Pb yaitu 0; 0,1; 0,2; 0,3 dan 0,4 terhadap pertumbuhan fase bahan superkonduktor Bi-2212 Ca 1,10 telah dilakukan dengan metode padatan pada suhu kalsinasi 800°C selama 10 jam dan suhu sintering 830°C selama 20 jam. Pengaruh doping Pb terhadap pertumbuhan fase bahan superkonduktor dapat dilihat berdasarkan fraksi volume, impuritas, dan derajat orientasi. Hasil penelitian menunjukkan sampel tanpa doping Pb (Pb 0) mempunyai nilai fraksi volume yang lebih rendah dibandingkan sampel dengan doping Pb (Pb 0,1-0,4). Penambahan doping Pb (Pb 0,1-0,4) akan meningkatkan fraksi volume. Fraksi volume (Fv) tertinggi pada doping Pb 0,4 yaitu 80,99%, sedangkan fraksi volume terendah pada doping Pb 0,1 yaitu 67,73%. Sampel tanpa doping Pb (Pb 0) mempunyai nilai derajat orientasi yang lebih rendah dibandingkan sampel dengan doping Pb (Pb 0,1-0,4). Penambahan doping Pb 0,1 dan 0,4 mempunyai derajat orientasi yang lebih tinggi dibandingkan dengan doping Pb 0,2 dan 0,3. . Sampel dengan doping Pb 0,1 memiliki nilai derajat orientasi tertinggi yaitu 24,87%. Penambahan doping Pb (Pb 0,1-0,4) akan menurunkan impuritas. Impuritas (I) tertinggi pada doping Pb 0 yaitu 32,20%, sedangkan impuritas terendah pada doping Pb 0,4 yaitu 19,01. Berdasarkan hasil SEM semua sampel telah menunjukkan lapisan-lapisan yang tersusun searah (terorientasi) dengan ruang kosong antara lempengan (*void*) relatif kecil.

**Kata kunci** : superkonduktor Bi-2212, doping Pb, fraksi volume, derajat orientasi

## ABSTRACT

### **Pb DOPING EFFECT AGAINST GROWTH PHASE OF SUPERCONDUCTOR INGREDIENTS Bi-2212 AT LEVELS OF Ca 1,10 AND SINTERING TEMPERATURE 830°C**

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*Research on the effect of Pb doping is 0; 0.1; 0.2; 0.3 and 0.4 to the phase growth of the Bi-2212 Ca 1.10 superconducting material was carried out by the solid state reaction method at a calcination temperature of 800 °C. for 10 hours and sintering temperature of 830 °C. for 20 hours. The effect of Pb doping on the phase growth of superconducting material can be seen by volume fraction, impurity, and degree of orientation. The results showed that samples without Pb doping (Pb 0) had lower volume fraction values than samples with Pb doping (Pb 0.1-0.4). Addition of Pb doping (Pb 0.1-0.4) will increase the volume fraction. The highest volume fraction (Fv) in Pb doping 0.4 was 80.99%, where as the lowest volume fraction on Pb doping 0.1 was 67.73%. Samples without Pb doping (Pb 0) had a lower orientation grade value than the sample with Pb doping (Pb 0.1-0.4). The addition of Pb doping 0.1 and 0.4 has a higher orientation degree compared to Pb doping of 0.2 and 0.3. The sample with Pb doping 0,1 has the highest orientation degree value that is 24,87%. The addition of Pb doping (Pb 0.1-0.4) will decrease the impurities. Impurities (I) highest in Pb doping 0 is 32,20%, whereas the lowest impurities in Pb doping 0,4 is 19,01%. Based on the SEM results all the seals have shown layers arranged in a direction (oriented) with empty space between the slab (void) is relatively small.*

**Key word** : Superconductor Bi-2212, doping Pb, volume fraction, orientation degree, impurities