

## ABSTRAK

### VARIASI KADAR $\text{CaCO}_3$ TERHADAP PEMBENTUKAN FASA SUPERKONDUKTOR BSCCO-2223 MENGGUNAKAN METODE PENCAMPURAN BASAH

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Penelitian ini dilakukan untuk mengetahui pengaruh kadar  $\text{CaCO}_3$  terhadap pembentukan fasa superkonduktor BSCCO-2223 dengan menghitung tingkat kemurnian fasa yang terbentuk, melihat stuktur mikro dan efek Meissnernya. Variasi  $\text{CaCO}_3$  yang dilakukan sebesar 1,95; 2,00; 2,05 dan 2,10 mol menggunakan metode pencampuran basah dengan suhu kalsinasi  $800\text{ }^\circ\text{C}$  selama 10 jam dan suhu sintering  $865\text{ }^\circ\text{C}$  selama 30 jam. Hasil karakterisasi XRD menunjukkan tingkat kemurnian fasa yang terbentuk meningkat seiring dengan bertambahnya kadar Ca dan optimum pada BSCCO/Ca 2,05 mol dan menurun pada BSCCO/Ca 2,10. Fraksi volume tertinggi didapatkan sebesar 74,48 % pada sampel BSCCO/Ca 2,05. Sedangkan fraksi volume terendah sebesar 48,17 % pada sampel BSCCO/Ca 1,95. Sementara, derajat orientasi tertinggi 11,61 % pada BSCCO/Ca 2,05. Derajat orientasi terendah 6,63 % pada BSCCO/Ca 1,95. Hasil karakterisasi SEM menunjukkan semua sampel telah terorientasi serta memiliki ruang kosong antar lempengan (*void*) yang relatif sedikit. Hasil uji efek Meissner menunjukkan hanya pada sampel BSCCO/Ca 2,05 yang mengalami efek Meissner lemah berupa penolakan medan magnet.

Kata kunci: Superkonduktor BSCCO-2223,  $\text{CaCO}_3$ , fraksi volume, derajat orientasi, dan efek Meissner.

## **ABSTRACT**

### **VARIATION OF $\text{CaCO}_3$ AGAINST THE PHASE'S FORMATION OF SUPERCONDUCTOR BSCCO-2223 USING THE WET-MIXING METHOD**

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This research was conducted to determine the effect of  $\text{CaCO}_3$  levels on the formation of the superconducting phase BSCCO-2223 by calculating the level of purity of the phases formed, looking at the microstructure and its Meissner effect. The variation of  $\text{CaCO}_3$  was 1.95; 2.00; 2.05 and 2.10 mole using the wet mixing method with a calcination's temperature is 800 °C for 10 hours and a sintering's temperature of 865 °C for 30 hours. The XRD's characterization results show that the level of purity of the formed phases increases with increasing Ca levels and its optimum at BSCCO/Ca 2.05 mole and then decreases at BSCCO/Ca 2.10. The highest volume fraction was 74,48 % in the BSCCO/Ca 2.05 sample. While the lowest volume fraction was 48.17 % in the BSCCO/Ca 1.95 sample. Meanwhile, the highest degree of orientation was 11.61 % at BSCCO/Ca 2.05. The lowest degree of orientation was 6.63 % at BSCCO/Ca 1.95. SEM's characterization results show of all samples have been oriented and have relatively little space between slabs (voids). The results of the Meissner effect show that only in the BSCCO/Ca 2.05 sample which showed a weak Meissner effect as the rejection of magnetic fields.

**Keywords:** Superconductors BSCCO-2223,  $\text{CaCO}_3$ , volume fraction, degree of orientation, and Meissner effect.