ABSTRACT

SYNTHESIS BSCCO-2223 SUPERCONDUCTION MATERIALS WITHOUT THE VARIOUS Pb DOPING LEVELS OF $CaCO_3$

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Studies have been conducted by varying levels of $CaCO_3$ on BSCCO-2223 superconduction materials without Pb doping. Variations of $CaCO_3$ is 1.95, 2.00, 2.05 and 2.10 using the method of solids (Solid State Reaction Method). Calcination was carried out at 800^oC for 10 hours, while the sintering carried out at 850°C for 20 hours. Synthesized samples were characterized using X-Ray Difraction (XRD) and Scanning Electron Microscopy (SEM). X-ray diffraction patterns were analyzed by Cellref program, so could known BSCCO-2223 phase was formed. The next phase the growth of BSCCO-2223 variables can be computed {fraction volume (FV), the degree of orientation (P) and impurity (I)}. The results showed that all the samples have formed BSCCO-2223 phase (indicated by the peaks phase of BSCCO-2223), and is oriented (shown by peaks with h = k = 0 and l is an even number. Results volume fraction (FV) obtained in this study with their respective levels of $CaCO_3$ 1.95, 2.00, 2.05 and 2.10, is 63.81%, 67.39%, 71.25% and 78.17%. Whereas the degree of orientation (P) in each sample were 45.56%, 44.65%, 33.20% and 34.22%, and impurity (I) of 36.19%, 32.61%, 28.75 % and 21.83%. Results showed that higher levels of $CaCO_3$, the higher the volume fraction (FV) value, whrereas for the highest degree of orientation (P) is in the levels of $CaCO_3$ 1.95.

Keywords: $CaCO_3$, the volume fraction, degree of orientation, Bi-2223 phase.