



Iranian Journal of Physics Research, Vol. 21, No. 3, 2021

Research note

Effect of the cold press and SPS process on the superconducting properties of Pb-BSCCO

M Fakhari Esferizi, H Shakeripour, H Salamati, P Kameli, and M Shamsedini

Department of Physics, Isfahan University of Technology, Isfahan

E-mail: f_brahim@birjand.ac.ir

(Received 28 January 2019 ; in final form 09 May 2021)

Abstract

Bismuth based high T_c superconductors are among the materials that have been extensively appreciated in terms of their application. Since this type of superconductors are very sensitive with respect to synthesis process, here, we consider effect of synthesis process on the electrical, magnetic and superconducting properties of Pb-BSCCO compound. The samples were prepared by both solid state and sol-gel reaction. In both of the preparation routes, two different methods of Cold Press (CP) and Spark Plasma Sintering (SPS) were used to compress the samples after, the completion of their calcination and grinding. In the next step, the samples put through the thermal process of sintering with different temperatures with respect to their preparation method. The results of the measurements indicate better superconducting properties in sol-gel method compare to the solid-state method. Also, it indicates better superconducting properties in Cold Press samples with respect to the samples prepared by SPS method. To compare the sintering temperature indicates that 825 and 830 °C are suitable temperature for sol-gel and solid-state samples, respectively, in Cold Press process.

Keywords: BSCCO superconductor, Spark Plasma Sintering (SPS), Cold Press (CP)

For full article, refer to the Persian section