CHARACTERISTICS DIFFERENCES BETWEEN PURE POROUS AND NON-POROUS OF $Bi_{1.6}Pb_{0.4}Sr_2Ca_2Cu_{3-x}O_{10}$ SUPERCONDUCTORS

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ABSTRACT

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The non-porous (Bi, Pb)-2223 superconductor has of has high density, but low critical current density, J_C value which is able to allow more current flows through the material. So, the porous (Bi, Pb)-2223 superconductor was introduced to improve the superconductivity properties of the superconductor. The improvement can be made through the electrical resistance characteristics such as the critical current density, J_C of the material. J_C is the measure of the maximum current that can flow in the wire without a resistance in superconducting materials. The non-porous (Bi, Pb)-2223 superconductor has a high density, but it loses superconducting properties because of low critical current density. Therefore, it is important to find out the difference of non-porous (Bi, Pb)-2223 superconductor with the porous one. Due to limitation of time, only T_C is able to find out. The Tc of the samples was investigated using four-point probe resistance test. The experimental results of non-porous (Bi, Pb)-2223 superconductors show a metallic-like behavior curve pattern, while the porous one shows neither superconductor, nor semi-conductor, nor even metallic behavior probably because of the large amount of crystalline sucrose added into the (Bi, Pb)-2223.

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