Preparation of YBCO superconductor nanoparticles by sol-gel combustion method

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Abstract
This paper describes the details of synthesizing nano crystalline YBCO superconductor using a sol-gel combustion method and the effect of sol pH and sintering temperature on particle size was investigated. The sintering temperature was chosen 880°C and the samples were annealed at this temperature for 5 hours. The morphology and structure of the nano scale products were characterized by powder X-ray diffraction and scanning electron microscopy. The results showed the samples prepared using the sol with pH of 5 and 7 have mean particle size of 500 and 200 nm, respectively. In order to investigate the effect of sintering temperature on the size of YBCO particles three sets of samples from the sol with pH of 7 were sintered at 800, 880 and 950°C. The results showed the samples sintered at 800, 880 and 950°C have the average particle size of 100, 200 and 400 nm respectively.

Keywords: YBCO superconductor, sol gel, combustion, nanoparticle

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