

Sintering temperature study on structure, magnetic properties and magnetoresistance of Pr_{0.67}Ba_{0.33}MnO₃

ABSTRACT

Polycrystalline perovskite manganite of Pr_{0.67}Ba_{0.33}MnO₃ (PBMO) bulk ceramic samples were prepared by conventional solid-state reaction method. The structures, typical magnetic properties and magnetoresistance were studied. At lower sintering temperature (900 °C to 1100 °C), formation of PBMO phase accompany by secondary phases of BaMnO₃ and Pr₆O₁₁ were observed. However, at 1200 °C, pure single phase of PBMO was obtained. PBMO compounds become denser upon the increase in sintering temperature. A reduction of secondary phases as sintering temperature increased lead to the enhancement of magnetization value. The highest room temperature %MR of 17.1% was found in sample sintered at 1200 °C in 10 kG external magnetic field. In summary, higher sintering temperature reduced multiphase formation and enhanced the magnetic and magnetoresistance properties.

Keyword: Colossal magnetoresistance; Magnetoresistance; Magnetotransport