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Effect of sintering temperature on microstructure and magnetic properties of double perovskite Y_2CoMnO_6

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Abstract:

Polycrystalline double perovskite Y_2CoMnO_6 oxides ceramics sintered at four different temperatures from 1000°C to 1300°C have been fabricated by conventional sol-gel method. All the Y_2CoMnO_6 compounds are single phase with monoclinic structure ($P2_1/n$ space group). The mean grain size grows significantly large and the shape becomes regular obviously with increasing sintering temperature. The effect of sintering temperature on magnetic properties of Y_2CoMnO_6 compounds has been studied in detail. We found that the oxygen vacancies are introduced by sintering at high temperature has a certain influence on the magnetic properties. Moreover, the magnetic entropy changes ($-\Delta S_M$) as well as relative cooling power (RCP) in the double perovskite Y_2CoMnO_6 oxides ceramics around paramagnetic to ferromagnetic transition were also investigated.

Keywords: Double perovskites; Magnetocaloric effect (MCE); Sintering temperature; $\text{RE}_2\text{CoMnO}_6$ oxides ceramics; Magnetic properties; Magnetic entropy change.

1 Introduction

In recent years, double perovskite oxides with the general chemical composition of $\text{RE}_2\text{BB}'\text{O}_6$ (RE = alkaline earths/rare-earth; $\text{B/B}'$ = two different transition metals) have been well researched

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