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Preparation, Oxygen Nonstoichiometry and Defect structure of Double Perovskite

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Abstract

Single-phase $\text{LaBaCo}_2\text{O}_{6-\delta}$ oxide, promising as oxygen storage or cathode material for solid oxide fuel cells, was prepared using two stage annealing technique. Its oxygen nonstoichiometry (δ) was measured as a function of oxygen partial pressure ($p\text{O}_2$) at temperatures (T) between 500 and 800 °C using thermogravimetric technique. The defect structure analysis for $\text{LaBaCo}_2\text{O}_{6-\delta}$ was carried out. The model proposed was shown to coincide well with the data on oxygen content.

Keywords

Perovskites; Defects; Ceramics; Thermal properties; Mixed ionic-electronic conductors

1. Introduction

Cobaltite $\text{LaBaCo}_2\text{O}_{6-\delta}$ is of particular importance among double perovskites $\text{REBaCo}_2\text{O}_{6-\delta}$ (RE – rare-earth element) since depending on conditions it can exist as either A-site disordered cubic perovskite or layered A-site ordered double perovskite [1-8]. Boullay et al. [2,9] reported that the ordering of La and Ba in A-sublattice can be achieved by carefully tailoring the synthesis conditions – T and $p\text{O}_2$. In this respect, the wide range of conditions described in literature [1-8,10-12] for obtaining the so-called “single phase” double perovskite looks really suspicious. The value of synthesis

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