

Accepted Manuscript

The annealing effects on the crystal structure, magnetism and microstructure of the ferromagnetic double perovskite $\text{Sr}_2\text{FeMoO}_6$ synthesized via spark plasma sintering

Dexin Yang, Tao Yang, Qing Sun, Yulong Chen, Giulio I. Lampronti



PII: S0925-8388(17)33058-X

DOI: [10.1016/j.jallcom.2017.09.027](https://doi.org/10.1016/j.jallcom.2017.09.027)

Reference: JALCOM 43083

To appear in: *Journal of Alloys and Compounds*

Received Date: 15 July 2017

Revised Date: 29 August 2017

Accepted Date: 2 September 2017

Please cite this article as: D. Yang, T. Yang, Q. Sun, Y. Chen, G.I. Lampronti, The annealing effects on the crystal structure, magnetism and microstructure of the ferromagnetic double perovskite $\text{Sr}_2\text{FeMoO}_6$ synthesized via spark plasma sintering, *Journal of Alloys and Compounds* (2017), doi: 10.1016/j.jallcom.2017.09.027.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The Annealing Effects on the Crystal Structure, Magnetism and Microstructure of the Ferromagnetic Double Perovskite $\text{Sr}_2\text{FeMoO}_6$ Synthesized via Spark Plasma Sintering

Dexin Yang,^{1,2*} Tao Yang,³ Qing Sun,¹ Yulong Chen¹ and Giulio I. Lampronti²

¹College of Materials Science and Engineering, Zhejiang University of Technology, No. 18 ChaoWang Road, Hangzhou 310014, People's Republic of China;

²Department of Earth Sciences, University of Cambridge, Cambridge CB2 3EQ, United Kingdom;

³College of Materials & Environmental Engineering, Hangzhou Dianzi University, Hangzhou 310036, China.

Abstract: Double perovskite $\text{Sr}_2\text{FeMoO}_6$ (SFMO) has drawn great attention because of its colossal magnetoresistance at room temperature and promising potential applications in solid oxide fuel cells as an anode material. In this study, the polycrystalline SFMO was prepared by spark plasma sintering (SPS) and its crystal structure, microtopography, magnetic properties, spin-glass phase and anti-site defects were investigated in detail. The effects of the annealing process on the physical properties of the SPS sample were detailedly discussed and studied. The annealing process can effectively suppress the spin-glass phases and impurity phase SrMoO_4 , and simultaneously increase the content of SFMO phases. Besides, the low-temperature magnetic behaviors were confirmed by the field cooling (FC), zero field cooling (ZFC) DC magnetic susceptibility and AC magnetic susceptibility. The TEM results confirm that the annealing process can effectively suppress the impurity phase SrMoO_4 , simultaneously increase the size of the SFMO crystal grains and improve the homogeneity of the crystal grains. This systematic study of double perovskite SFMO will facilitate its potential applications in the field of spin electronics.

Keywords: Double perovskites; $\text{Sr}_2\text{FeMoO}_6$; Ferromagnet; Annealing effects; SPS

*Corresponding author. E-mail address: yangdexin1988@126.com; dy263@zjut.edu.cn.

Download English Version:

<https://daneshyari.com/en/article/5458146>

Download Persian Version:

<https://daneshyari.com/article/5458146>

[Daneshyari.com](https://daneshyari.com)