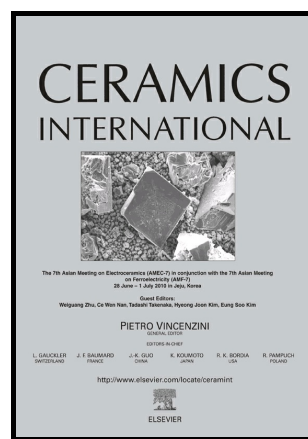


Investigation of layered perovskite $\text{NdBa}_{0.5}\text{Sr}_{0.25}\text{Ca}_{0.25}\text{Co}_2\text{O}_{5+\delta}$ as cathode for solid oxide fuel cells

Chuangang Yao, Haixia Zhang, Xiaojuan Liu, Junling Meng, Xiong Zhang, Fanzhi Meng, Jian Meng



www.elsevier.com/locate/ceri

PII: S0272-8842(18)30788-0
DOI: <https://doi.org/10.1016/j.ceramint.2018.03.206>
Reference: CER117843

To appear in: *Ceramics International*

Received date: 1 January 2018
Revised date: 23 March 2018
Accepted date: 23 March 2018

Cite this article as: Chuangang Yao, Haixia Zhang, Xiaojuan Liu, Junling Meng, Xiong Zhang, Fanzhi Meng and Jian Meng, Investigation of layered perovskite $\text{NdBa}_{0.5}\text{Sr}_{0.25}\text{Ca}_{0.25}\text{Co}_2\text{O}_{5+\delta}$ as cathode for solid oxide fuel cells, *Ceramics International*, <https://doi.org/10.1016/j.ceramint.2018.03.206>

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 galley proof before it is published in its final citable 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.

Investigation of layered perovskite $\text{NdBa}_{0.5}\text{Sr}_{0.25}\text{Ca}_{0.25}\text{Co}_2\text{O}_{5+\delta}$ as cathode for solid oxide fuel cells

Chuangang Yao,^{a*} Haixia Zhang,^a Xiaojuan Liu,^b Junling Meng,^b

Xiong Zhang,^b Fanzhi Meng,^{c*} Jian Meng^b

^a School of New Energy, Bohai University, Jinzhou 121007, PR China

^b State Key Laboratory of Rare Earth Resources Utilization, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022, P. R. China

^c School of Materials Science and Engineering, Changchun University of Science and Technology, Changchun 130022, PR China

Abstract

Layered perovskite oxides with and without Ca-doped $\text{NdBa}_{0.5}\text{Sr}_{0.25}\text{Ca}_{0.25}\text{Co}_2\text{O}_{5+\delta}$ (NBSCaCO) and $\text{NdBa}_{0.5}\text{Sr}_{0.5}\text{Co}_2\text{O}_{5+\delta}$ (NBSCO) are studied to investigate the effects of Ca doping on the crystal structure, thermal behavior, electrical and electrochemical properties. Both NBSCO and NBSCaCO are tetragonal structure with $P4/mmm$ space group. The average thermal expansion coefficient (TEC) value is reduced from $23.3 \times 10^{-6} \text{ K}^{-1}$ to $19.8 \times 10^{-6} \text{ K}^{-1}$ during 30-800 °C. The electrical conductivities are increased by Ca doping. Both electrical conductivities of NBSCO and NBSCaCO are higher than $600 \text{ S} \cdot \text{cm}^{-1}$ over 30-800 °C. Substitution of Sr with Ca can effectively improve the electrochemical properties of NBSCaCO. From 650 °C to 800 °C, the area specific resistance (ASR) of NBSCaCO are decreased from 0.62 to $0.062 \text{ } \Omega \cdot \text{cm}^2$ and the corresponding output power density are increased from 258 to $812 \text{ mW} \cdot \text{cm}^{-2}$. On the basis of these results, Ca doped

* Corresponding author. Tel.: +86-416-3400708; Fax: +86-416-3400708

E-mail address: yaochuangang@bhu.edu.cn (Chuangang Yao); mengtiantang0527@gmail.com (Fanzhi Meng)

Download English Version:

<https://daneshyari.com/en/article/7886679>

Download Persian Version:

<https://daneshyari.com/article/7886679>

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