

Accepted Manuscript

Title: Durability and performance of CGO barriers and LSCF cathode deposited by spray-pyrolysis

Authors: L. dos Santos-Gómez, J. Hurtado, J.M. Porras-Vázquez, E.R. Losilla, D. Marrero-López



PII: S0955-2219(18)30161-4
DOI: <https://doi.org/10.1016/j.jeurceramsoc.2018.03.024>
Reference: JECS 11781

To appear in: *Journal of the European Ceramic Society*

Received date: 12-1-2018
Revised date: 12-3-2018
Accepted date: 16-3-2018

Please cite this article as: dos Santos-Gómez L, Hurtado J, Porras-Vázquez JM, Losilla ER, Marrero-López D, Durability and performance of CGO barriers and LSCF cathode deposited by spray-pyrolysis, *Journal of The European Ceramic Society* (2018), <https://doi.org/10.1016/j.jeurceramsoc.2018.03.024>

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.

Durability and performance of CGO barriers and LSCF cathode deposited by spray-pyrolysis

L. dos Santos-Gómez^a, J. Hurtado^b, J.M. Porras-Vázquez^a, E.R. Losilla^a, D. Marrero-López^{b,*}

^aUniversidad de Málaga, Departamento de Química Inorgánica, 29071-Málaga, Spain.

^bUniversidad de Málaga, Departamento de Física Aplicada I, Laboratorio de Materiales y Superficie, 29071-Málaga, Spain.

* Corresponding author.

E-mail address: marrero@uma.es (David Marrero-López)

Present address: Dpto. de Física Aplicada I, Laboratorio de Materiales y Superficies, Facultad de Ciencias, Campus de Teatinos, Universidad de Málaga, 29071-Málaga, Spain.

Tel: +34 952137057, Fax: +34 952132382

ABSTRACT

$\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{1.95}$ (CGO) protective layers are prepared by two different methods to prevent the reaction between the $\text{Zr}_{0.84}\text{Y}_{0.16}\text{O}_{1.92}$ (YSZ) electrolyte and the $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$ (LSCF) cathode. In the first method, the CGO layers are deposited by an airbrushing technique from an ink containing CGO particles without and with cobalt as sintering aids. The second strategy consists in preparing both a dense CGO barrier layer and a porous LSCF cathode by spray-pyrolysis deposition, in order to further reduce the fabrication temperature and minimize the reaction between the cell components. The samples prepared by spray-pyrolysis exhibit better performance and durability than those obtained by conventional sintering methods. The results suggest that the interfacial reactivity between YSZ and LSCF as well as the Sr-enrichment at the cathode surface can be avoided by using low-temperature fabrication methods and by operating at temperatures lower than 650 °C.

Keywords: Solid Oxide Fuel Cells; $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$; $\text{Zr}_{0.84}\text{Y}_{0.16}\text{O}_{1.92}$; CeO_2 ; spray-pyrolysis

Download English Version:

<https://daneshyari.com/en/article/7898062>

Download Persian Version:

<https://daneshyari.com/article/7898062>

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