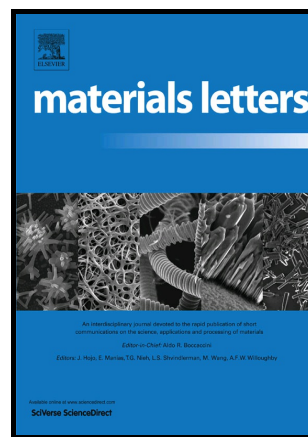


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PII: S0167-577X(16)31726-8
DOI: <http://dx.doi.org/10.1016/j.matlet.2016.10.114>
Reference: MLBLUE21684

To appear in: *Materials Letters*

Received date: 10 August 2016
Revised date: 23 October 2016
Accepted date: 30 October 2016

Cite this article as: Jin Xiao, Lei Chen, Hongchun Yuan, Lei Ji, Chao Xiong Jinxiang Ma and Xifang Zhu, Fabrication and characterization of $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.2}\text{O}_{3-\delta}$ based anode supported solid oxide fuel cells by tape casting combined with spray coating, *Materials Letters* <http://dx.doi.org/10.1016/j.matlet.2016.10.114>

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Fabrication and characterization of $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.2}\text{O}_{3-\delta}$ based anode supported solid oxide fuel cells by
tape casting combined with spray coating

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Abstract

Anode-supported proton-conducting solid oxide fuel cells (SOFC) based on $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.2}\text{O}_{3-\delta}$ (BZCY) electrolytes were fabricated using tape casting combined with spray coating technique. Dense BZCY electrolyte membranes were achieved when the co-sintering temperature was as low as 1300 °C, and a good adherence of anode to electrolyte membrane was obtained when the co-sintering temperature was up to 1350 °C. Meanwhile, perovskite oxide $\text{La}_{0.6}\text{Ba}_{0.4}\text{Fe}_{0.8}\text{Ni}_{0.2}\text{O}_{3-\delta}$ (LBFN) was synthesized and the LBFN-BZCY composite material was employed as a novel cobalt-free cathode, the single cell with a 17- μm -thick BZCY electrolyte generated a maximum power density of 232 mW cm^{-2} at 650 °C.

Keywords: Ceramics; Solid oxide fuel cell; Tape casting; Spray-coating; Sintering

1. Introduction

Acceptor-doped BaCeO_3 compounds have been studied as electrolytes for intermediate-temperature

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