

Accepted Manuscript

(LaSr)_xMnO₃ Cathode Stoichiometry Effects on Electrochemical Performance in Contact with AISI 441 Steel Interconnect

Kathy Lu, Fengyu Shen, Rose Roberts, Grayson Doucette, Matthew McGuire, Wenle Li

PII: S0378-7753(14)00905-7

DOI: [10.1016/j.jpowsour.2014.06.051](https://doi.org/10.1016/j.jpowsour.2014.06.051)

Reference: POWER 19285

To appear in: *Journal of Power Sources*

Received Date: 9 December 2013

Revised Date: 23 April 2014

Accepted Date: 9 June 2014

Please cite this article as: K. Lu, F. Shen, R. Roberts, G. Doucette, M. McGuire, W. Li, (LaSr)_xMnO₃ Cathode Stoichiometry Effects on Electrochemical Performance in Contact with AISI 441 Steel Interconnect, *Journal of Power Sources* (2014), doi: 10.1016/j.jpowsour.2014.06.051.

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.



(LaSr)_xMnO₃ Cathode Stoichiometry Effects on Electrochemical Performance in Contact with AISI 441 Steel Interconnect

Kathy Lu^{*}, Fengyu Shen, Rose Roberts, Grayson Doucette, Matthew McGuire, Wenle Li

Department of Materials Science and Engineering, Virginia Tech, Blacksburg, VA, USA 24061

Detail contact information:

Kathy Lu, 211B Holden Hall, Materials Science and Engineering Department, Virginia Tech,
Blacksburg, VA 24061, USA. Email: klu@vt.edu; Phone: 540-231-3225; Fax: 540-231-8919

Abstract

Cathode plays an important role in solid oxide fuel cell performance. This work studies the stoichiometry effect of (LaSr)_xMnO₃ (LSM) cathode on its electrochemical behaviors at 800°C by investigating the interfacial reaction of an AISI 441 interconnect/LSM electrode/yttria-stabilized zirconia (YSZ) electrolyte half-cell structure. Ohmic resistance and polarization resistance of the cathodes are analyzed by deconvoluting the electrochemical impedance spectroscopy (EIS) data. The results show that the polarization resistance is dominant for decreasing the half-cell performance. Microstructure and phase analyses show that A-site excessive LSM sample experiences stronger bonding with the YSZ electrolyte. Energy dispersive X-ray spectroscopy analyses reveal that Cr species first deposits and then is incorporated into the cathode perovskite structure by replacing Sr in the structure. Based on the above observations, the interaction mechanisms for the AISI 441 interconnect/LSM

^{*} Corresponding author: Kathy Lu. Email: klu@vt.edu; Phone: (+1) 540-231-3225; Fax: 540-231-8919

Download English Version:

<https://daneshyari.com/en/article/7736040>

Download Persian Version:

<https://daneshyari.com/article/7736040>

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