Electrochemical Impedance Studies of SOFC Cathodes - DTU Orbit (15/12/2018)

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Mixed ion- and electron-conducting composite electrodes consisting of doped ceria and perovskite have been studied by electrochemical impedance spectroscopy (EIS) at different temperatures and oxygen partial pressures. This paper aims to describe the different contributions to the polarisation impedance of the cathode at intermediate operating temperatures. The perovskite is of the La-Sr-Co-Fe type. The EIS response of symmetrical cells with a thick (similar to 200 μm) gadolinia doped ceria electrolyte was compared with the impedance contribution of the cathode of a full anode supported cell. The full cells had a Ni-YSZ anode and anode support, a thin YSZ electrolyte, and a CGO barrier layer. The symmetric and full cell cathode responses were compared at open-circuit voltage. Humidified hydrogen was used as the fuel in the full cell measurements. Differential analysis of the impedance data was used to identify frequency ranges where changes occur upon degradation and oxygen partial pressure variations.

**General information**

State: Published  
Contributors: Hjelm, J., Søgaard, M., Wandel, M., Mogensen, M. B., Menon, M., Hagen, A.  
Pages: 1261-1270  
Publication date: 2007  
Peer-reviewed: Yes

**Publication information**

Journal: E C S Transactions  
Volume: 7  
Issue number: 1  
ISSN (Print): 1938-5862  
Ratings:  
BFI (2018): BFI-level 1  
BFI (2017): BFI-level 1  
Scopus rating (2017): CiteScore 0.44 SJR 0.225 SNIP 0.252  
Web of Science (2017): Indexed yes  
BFI (2016): BFI-level 1  
Scopus rating (2016): CiteScore 0.4 SJR 0.228 SNIP 0.253  
BFI (2015): BFI-level 1  
Scopus rating (2015): CiteScore 0.36 SJR 0.211 SNIP 0.244  
BFI (2014): BFI-level 1  
Scopus rating (2014): CiteScore 0.36 SJR 0.212 SNIP 0.234  
BFI (2013): BFI-level 1  
Scopus rating (2013): CiteScore 0.27 SJR 0.192 SNIP 0.231  
ISI indexed (2013): ISI indexed no  
BFI (2012): BFI-level 1  
Scopus rating (2012): CiteScore 0.29 SJR 0.241 SNIP 0.26  
ISI indexed (2012): ISI indexed no  
BFI (2011): BFI-level 1  
Scopus rating (2011): CiteScore 0.36 SJR 0.261 SNIP 0.28  
ISI indexed (2011): ISI indexed no  
BFI (2010): BFI-level 1  
Scopus rating (2010): SJR 0.249 SNIP 0.251  
BFI (2009): BFI-level 1  
Scopus rating (2009): SJR 0.242 SNIP 0.27  
BFI (2008): BFI-level 1  
Scopus rating (2008): SJR 0.254 SNIP 0.255  
Scopus rating (2007): SJR 0.213 SNIP 0.206  
Scopus rating (2006): SJR 0.134 SNIP 0.073  
Original language: English  
Electronic versions:  
Hjelm.pdf  
DOIs:  
10.1149/1.2729227