Electromotive Potential Distribution and Electronic Leak Currents in Working YSZ Based SOCs

The size of electronic leak currents through the YSZ electrolyte of solid oxide cells have been calculated using basic solid state electrochemical relations and literature data. The distribution of the electromotive potential, of Galvani potential, of concentration of electrons, e, and electron holes, h, was also calculated as these parameters are the basis for the understanding of the electronic conductivity that causes the electronic leak currents. The results are illustrated with examples. The effects of electrolyte thickness, temperature and cell voltage on the electronic leak current density are reported.

General information
State: Published
Organisations: Electrochemistry, Fuel Cells and Solid State Chemistry Division, Risø National Laboratory for Sustainable Energy, Physical Chemistry, Department of Chemistry
Contributors: Mogensen, M. B., Jacobsen, T.
Pages: 1315-1320
Publication date: 2009
Peer-reviewed: Yes

Publication information
Journal: ECS Transactions
Volume: 25
Issue number: 2
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
Keywords: Solid Oxide Fuel Cells, Fuel Cells and hydrogen
Electronic versions:
Mogensen.pdf
DOIs:
10.1149/1.3205660