Integrated Cr and S poisoning of $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ (LSCF) cathode of solid oxide fuel cells

Cheng Cheng Wang[a,b,*], Mortaza Gholizadeh[c], Bingxue Hou[d], Xincan Fan[a,*]

[a]*Shen Zhen Polytechnic, Shenzhen, 518055, China*

[b]*Fuels and Energy Technology Institute & Department of Chemical Engineering, Curtin University, Perth, WA 6102, Australia*

[c]*Faculty of Chemical and Petroleum Engineering, University of Tabriz, Tabriz, Iran*

[d]*Aviation Engineering Institute, Civil Aviation Flight University of China, GuangHan,618037, China*

*Corresponding author:

sabrinachch_123@hotmail.com (Dr.C.C. Wang)

horsefxc@szpt.edu.cn (Prof.Fan)

Supporting information

Figure S1. Polarization (a) and impedance curves (b) for O_2 reduction reaction of porous LSCF cathodes in the presence of 1 ppm SO_2 at a cathodic current of 200 mA cm^{-2} for 40 hours at 800 °C.

Figure S2. Polarization (a) and impedance curves (b) for O_2 reduction reaction of porous LSCF cathodes in the presence of 1 ppm SO_2 at a cathodic current of 200 mA cm^{-2} for 40 hours at 800 °C.

Figure S3. Fitted impedance curve for O_2 reduction reaction of porous LSCF cathodes in the presence of Fe-Cr alloy for 20 hours at 800 °C (a) 0h, (b) 20h.

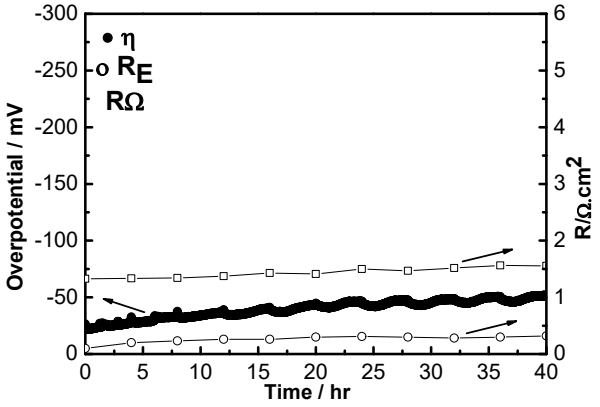
-300
-250
-200
-150
-100
-50
0
Overpotential / mV
η
R_E
RΩ
0
5
10
15
20
25
30
35
40
Time / hr
6
5
4
3
2
1
0
R/Ω.cm2

Figure S1.

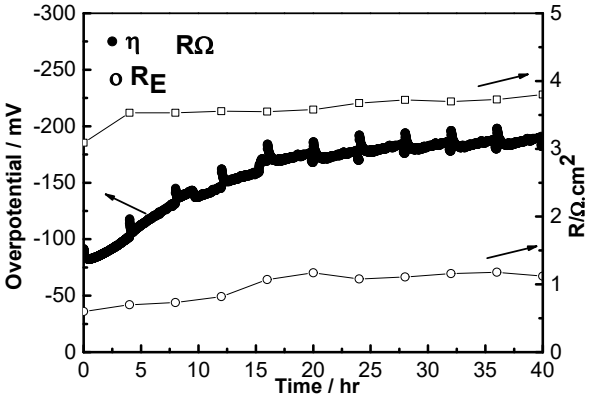
-300
-250
-200
-150
-100
-50
0
5
4
3
2
1
0
0
5
10
15
20
25
30
35
40
• η RΩ
o RE
Overpotential / mV
R/Ω.cm2
Time / hr

Figure S2.

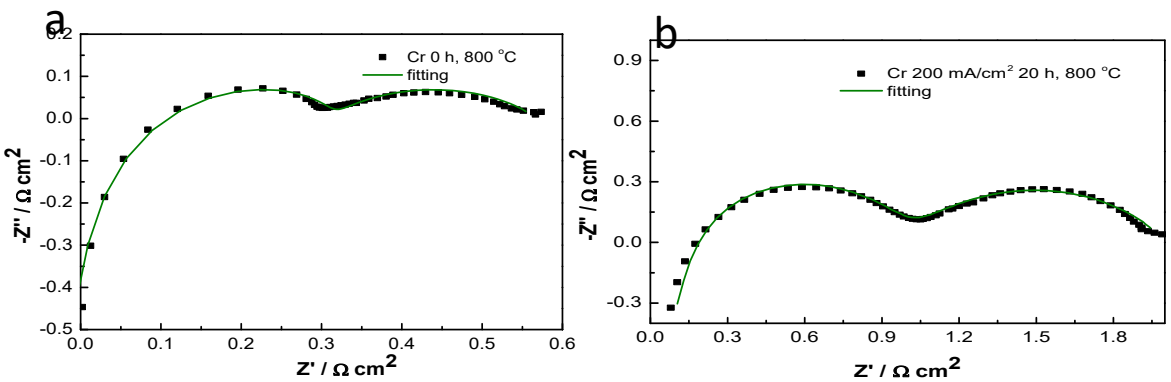
a
Cr 0 h, 800 °C
fitting
-Z'' / Ω cm2
Z' / Ω cm2
b
Cr 200 mA/cm2 20 h, 800 °C
fitting
-Z'' / Ω cm2
Z' / Ω cm2

Figure S3.