Supplementary Information

Stable High Current Density Operation of La$_{0.6}$Sr$_{0.4}$Co$_{0.2}$Fe$_{0.8}$O$_{3-\delta}$ Oxygen Electrodes

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Supplementary Fig. 1 shows the evolution of the Nyquist and Bode plots for the electrode tested at 750 °C and $j = 1.5 \text{ A cm}^{-2}$ at 0, 290, and 1013 hours. The cell shows remarkable stability with no significant changes in either plot.

Supplementary Figure 1. Evolution of Nyquist and Bode plots for LSCF|GDC|LSCF cells. Impedance spectra are shown at 0, 290, and 1013 hours during operation at 750 °C and $j = 1.5 \text{ A cm}^{-2}$. 
Supplementary Fig. 2 shows the evolution of the Nyquist and Bode plots for the electrode undergoing surface cleaning at 0, 1000, 2000, 2503, and 2690 hours. The cell shows a reset in the Nyquist plot with small variations, mostly in the ohmic resistance which is likely due to variations in temperature from removing the cell from the furnace multiple times. Slight changes are seen in $R_G$, which is likely due to small differences in the time the impedance spectra was taken and when the furnace was calibrated to 750 °C.
Supplementary Figure 2. Nyquist and Bode plots for LSCF|GDC|LSCF cells after each surface cleaning step at 0, 1000, 2000, 2503, and 2690 hours using deionized water at room temperature and thermal annealing at 750 °C.