

Supporting information:

Nanoengineering of electrodes via infiltration: an opportunity for developing large-area solid oxide fuel cells with high power density

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Initial characterizations:

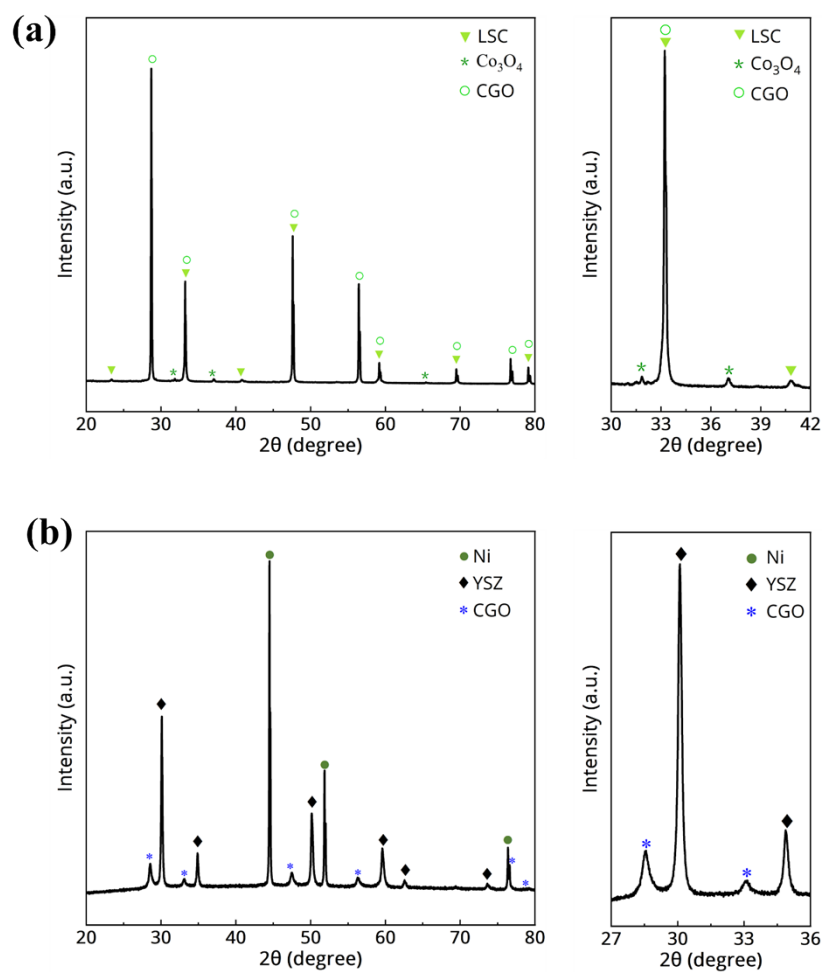


Figure S1. The XRD pattern obtained on the (a) LSC/Co₃O₄-CGO cathode and (b) CGO-Ni/YSZ anode.

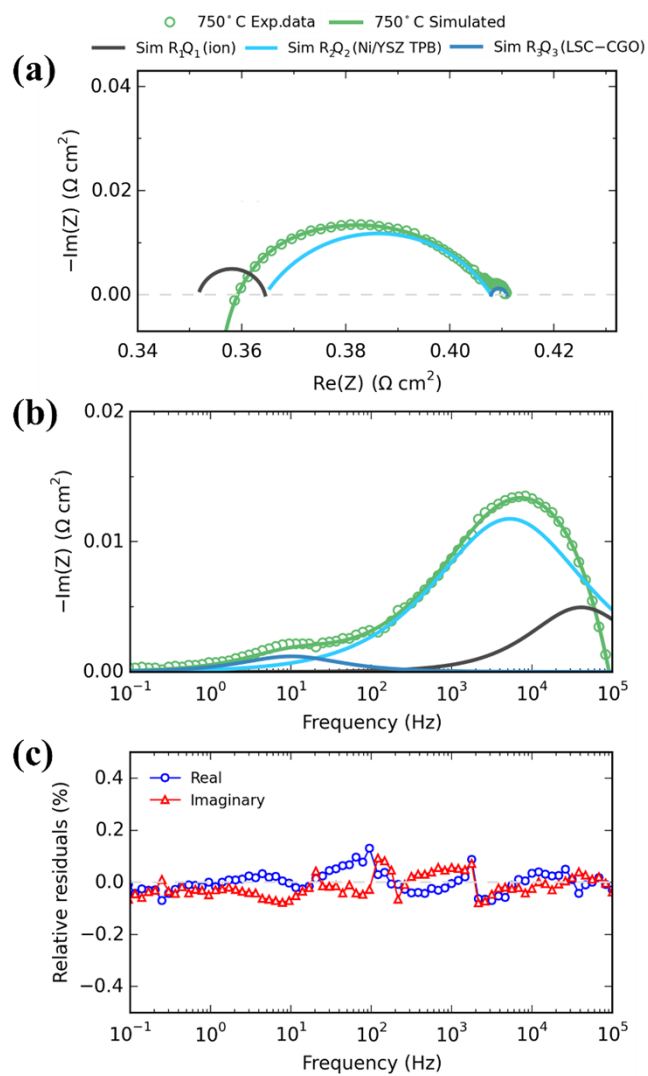


Figure S2. (a) CNLS fits of inductance corrected impedance spectra of the symmetrical cell obtained under OCV at 750 °C in dry air. (b) The corresponding Bode plots. (c) The relative residual plots.

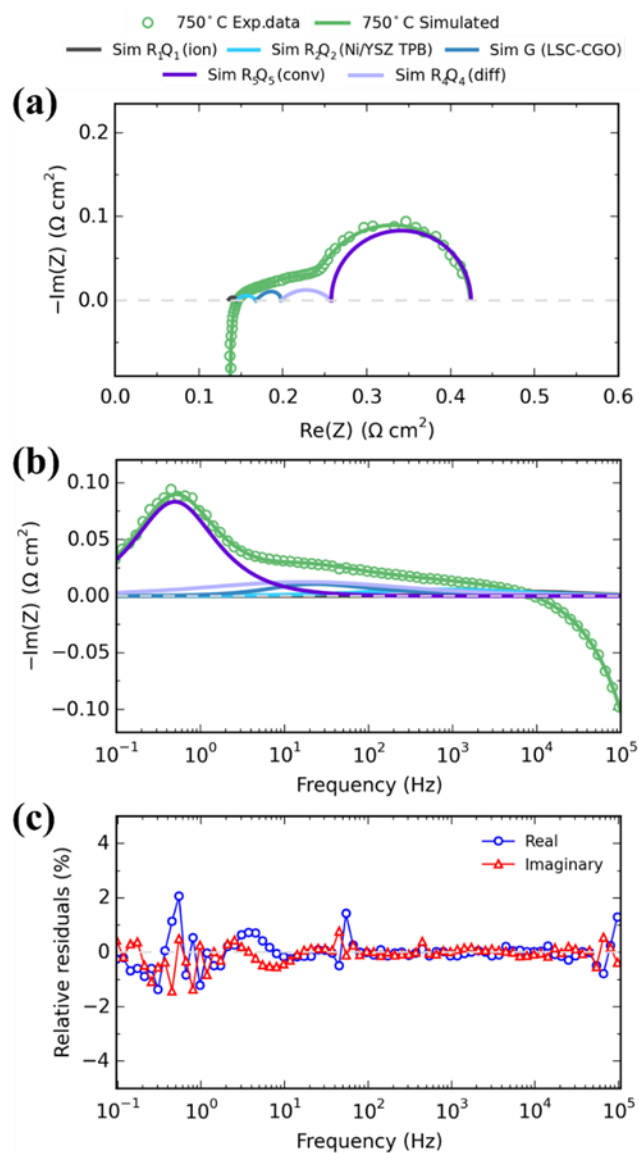


Figure S3. (a) CNLS fits of inductance corrected impedance spectra of the full cell obtained under OCV at 750 °C with 4% H_2O -96% H_2 supplied to the anode and dry air to the cathode in dry air. (b) The corresponding Bode plots. (c) The relative residual plots.

Table S1 Electrochemical performance of the Ni/YSZ anode-supported solid oxide fuel cells

Half-cell configuration	Cathode	Active area (cm ²)	Temperature (°C)	Power density at 0.6V (W cm ⁻²)	R_p (Ω cm ²)	Ref.
Ni/YSZ YSZ GDC	LSCF-1	100	740	0.42		1
Ni/YSZ YSZ	LSCF-2	79.21	800	0.263	1.182	2
Ni/YSZ Ni/SSZ SSZ CGO	LSCF/CGO-1	100	750	0.483	1.210	3
			700	0.325	1.830	
			650	0.2	2.430	
Ni/YSZ YSZ CGO	LSCF/CGO-2	100	720	0.354	3.00	4
Ni/YSZ YSZ CGO	LSCF/CGO-3	7.065	700	0.27 (at 0.72V)	0.475	5
			650	0.25 (at 0.65V)	0.445	
			600	0.161	0.814	
Ni/YSZ YSZ	LSCF/CGO-4	0.5	850	0.524	1.143	6
			800	0.427	1.138	
			750	0.321	1.403	
Ni/YSZ YSZ	LSCF/CGO-5	0.5	800	0.433	0.954	7
Ni/YSZ YSZ	LSCF/CGO-6	0.5	800	0.391	0.455	8
			750	0.319	0.684	
			700	0.291	0.747	
Ni/YSZ YSZ	LSCF-YSZ-1	81	750	0.469		9
			700	0.411		
			650	0.366		
			600	0.298		
Ni/YSZ YSZ	LSCF-YSZ-2	16	800	0.831 (at 0.7V)	0.670	10
Ni/YSZ YSZ	LSCF-YSZ-3	16	800	0.558 (at 0.7V)		11
Ni/YSZ YSZ	LSCF-YSZ-4	0.2	800	0.877	0.202	12
			750	0.754	0.257	

			700	0.626	0.343	
Ni/YSZ YSZ	LSM/SSZ	2	800	0.762	0.620	13
			750	0.516	0.890	
			700	0.278	1.280	
			700	0.278	1.280	
Ni/YSZ YSZ	LSF-YSZ	0.5	800	0.611	0.260	14
			750	0.47	0.550	
			700	0.362	0.810	
Ni/YSZ YSZ	LCN-CGO-YSZ	16	700	0.657		15
	LCN-CGO-YSZ	16	700	0.686	0.550	
	LCN-CGO-YSZ	16	700	0.974	0.460	
	LSC-CGO-YSZ	16	700	1.026	0.357	
Ni/YSZ YSZ	LSC/CGO	16	700	0.532		16
			650	0.383		
			600	0.245		
Ni/YSZ YSZ CGO	LSC-CGO	16	800	1.34	0.260	17
			750	1.08	0.300	
			700	0.7	0.380	

$La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ (LSCF), $La_{0.8}Sr_{0.2}MnO_3$ (LSM), $Zr_{0.89}Sc_{0.1}Ce_{0.01}O_{2-\delta}$ (SSZ), $La_{0.6}Sr_{0.4}FeO_{3-\delta}$ (LSF), $La_{0.6}Sr_{0.4}CoO_{3-\delta}$ (LSC).

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