

Supporting Information

A Redox-Reversible A/B-site Co-doped BaFeO₃ Electrode for Direct Hydrocarbon Solid Oxide Fuel Cells

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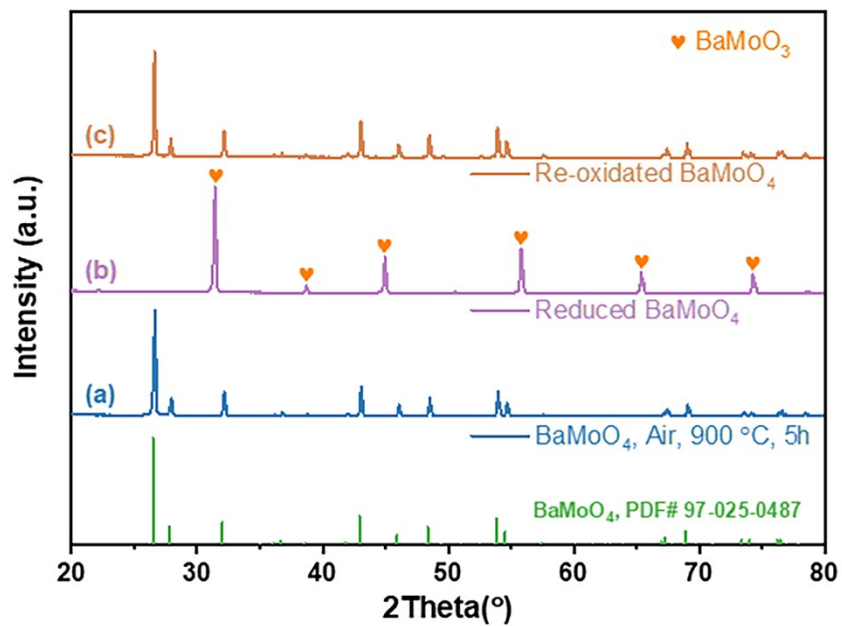


Fig. S1 X-ray diffraction patterns of (a) as-prepared BMO₄, (b) BMO₄ reduced in H₂ at 800 °C for 5 h, and (c) reduced BMO₄ being re-oxidated at 800 °C for 5 h in air.

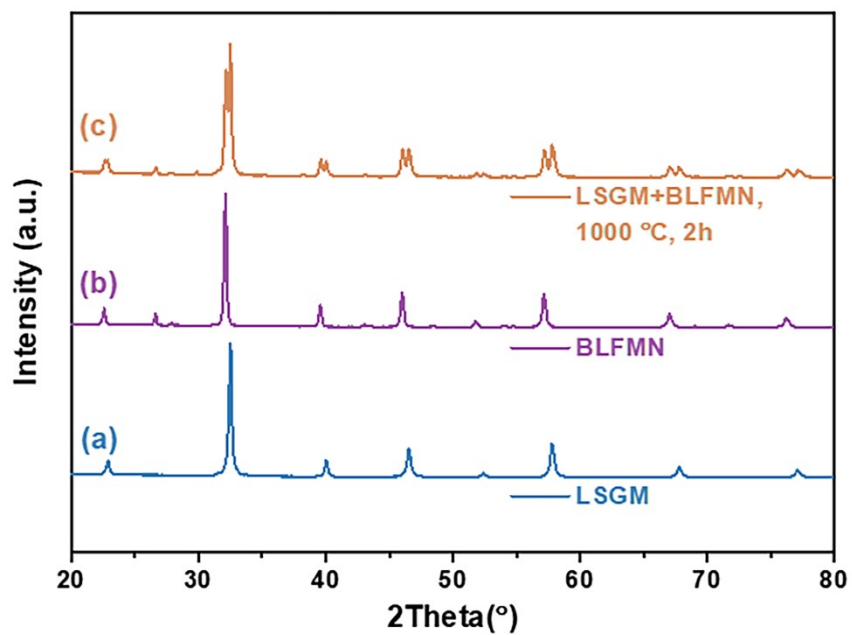


Fig. S2 Compatibility (c) of LSGM (a) and BLFMN (b) electrolyte powder heat-treated at 1000 °C for 2h in air.

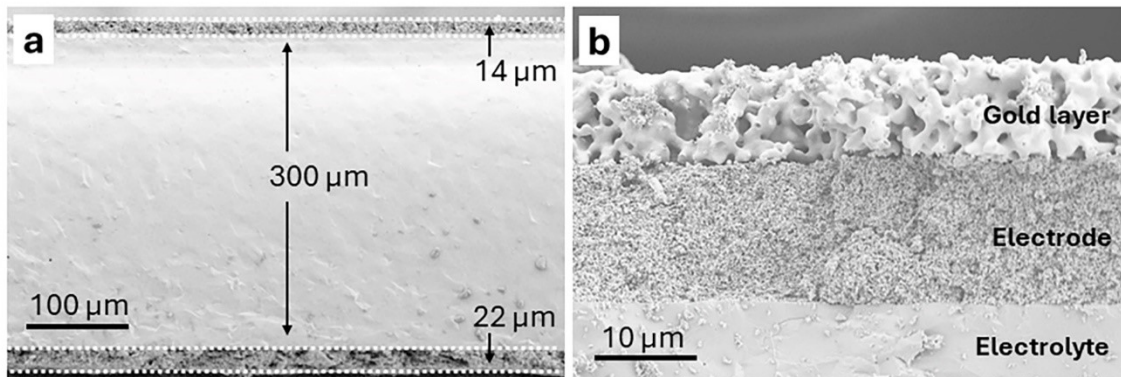


Fig. S3 (a) SEM images of the cross-section of the electrolyte support single cells with BLFMN as the anode (22 μm) and LSCF as cathode (14 μm), (b) three-layered structure of the cell including electrolyte, electrode and gold current collector layer.

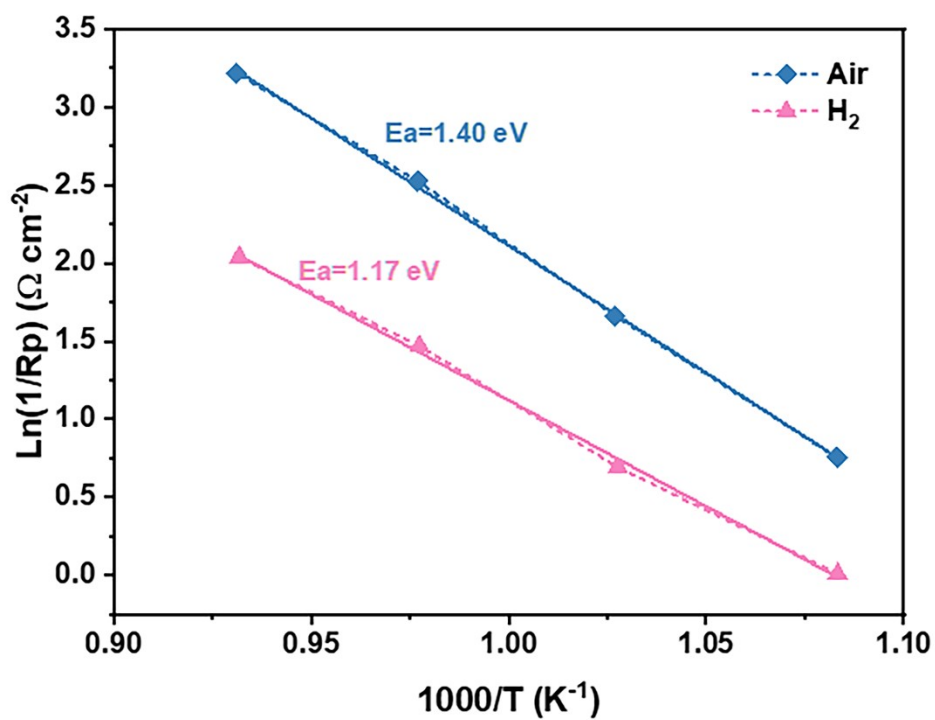


Fig. S4 Arrhenius plot of ASR of BLFMN symmetric cells measured in air and H_2 as a function of the operating temperature.

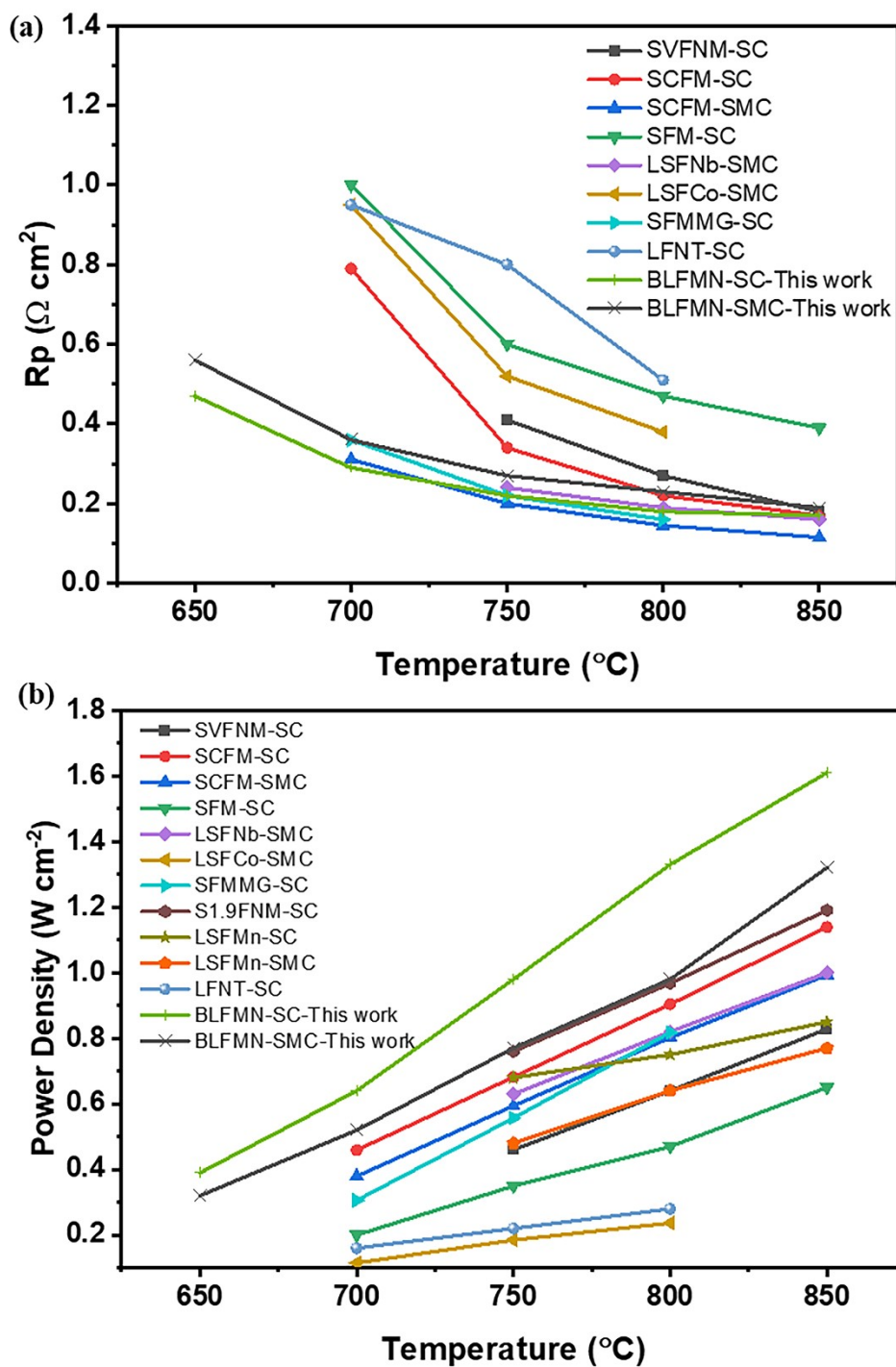


Fig. S5 Comparison of Rp and power density for part of the reported electrodes listed in Table 2 at the temperature range of 650-850 $^{\circ}\text{C}$.

Table S1 R_{Ω} , R_p and P_{\max} values for BLFMN single cell and symmetric cell test at 650-850 °C.

T (°C)	Single Cell			Symmetric Cell		
	R_{Ω} ($\Omega \text{ cm}^2$)	R_p ($\Omega \text{ cm}^2$)	P_{\max} (W cm^{-2})	R_{Ω} ($\Omega \text{ cm}^2$)	R_p ($\Omega \text{ cm}^2$)	P_{\max} (W cm^{-2})
850	0.12	0.16	1.61	0.13	0.19	1.32
800	0.14	0.18	1.33	0.17	0.23	0.93
750	0.18	0.22	0.98	0.22	0.27	0.77
700	0.25	0.29	0.64	0.30	0.36	0.52
650	0.37	0.47	0.39	0.42	0.56	0.32