Enhanced Electrocatalytic Activity and Stability for High Performance Symmetrical Solid Oxide Fuel Cells with Praseodymium-Doped $SrCo_{0.2}Fe_{0.8}O_{3-\delta}$ Electrodes

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Table S1. XRD refinement results for $P_{0.2}SCF$, $P_{0.2}SCF@2$ 及 $P_{0.2}SCF@100$.

		$P_{0.2}SCF$	$P_{0.2}SCF@2$	$P_{0.2}SCF@100$
space group		P/mmm	P/mmm	P/mmm
Cell parameters	a(Å)	3.8506	3.8505	3.8518
	b(Å)	2.7229	2.7228	2.7234
	c(Å)	2.5673	2.5674	2.7235
cell volume	V(Å3)	26.917	26.916	28.560

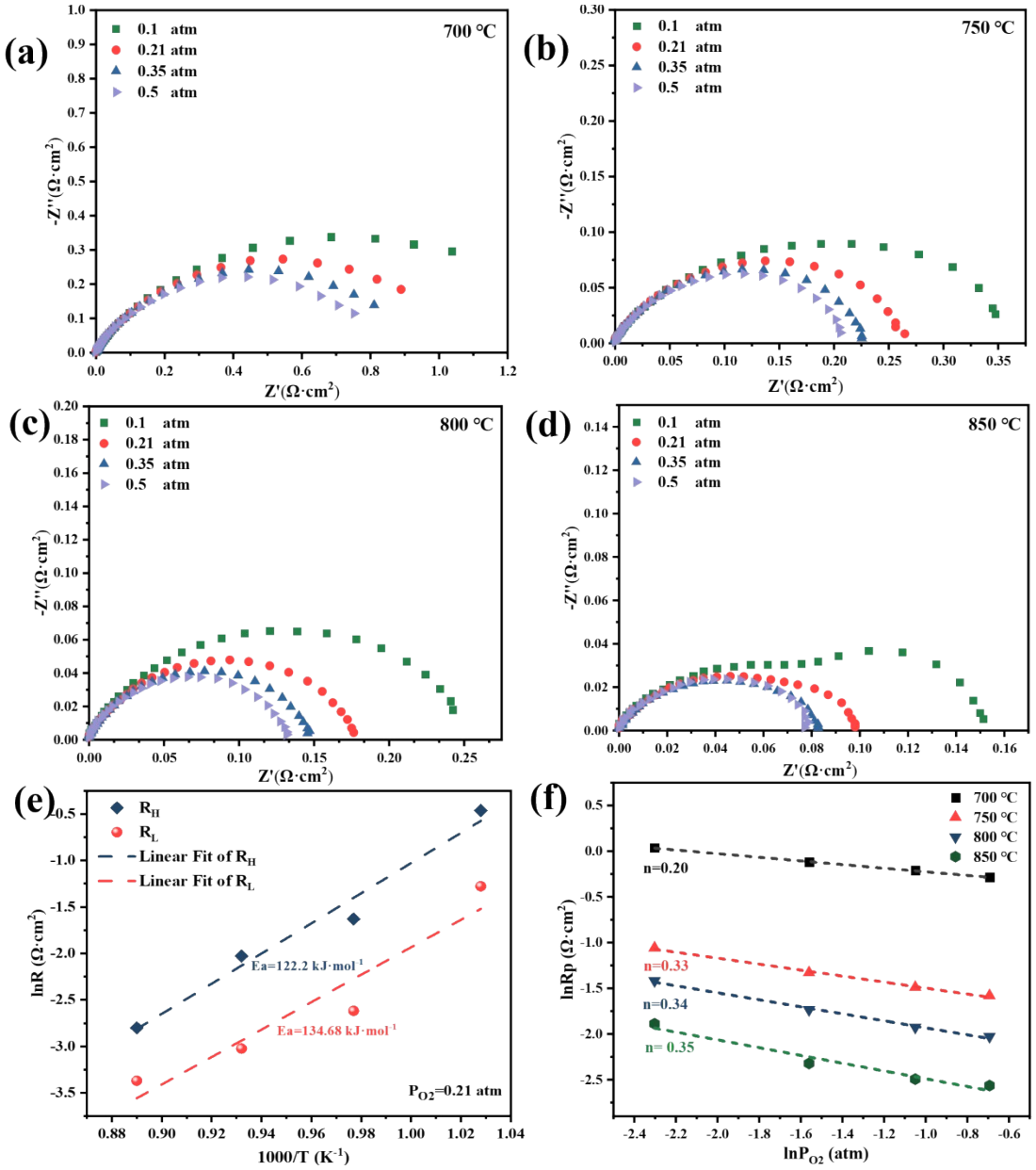

Figure S1. (a, b, c, d) Impedance spectra at 700 °C, 750 °C, 800 °C, and 850 °C at different oxygen partial pressures, (e) Arrhenius plots of R_H, and R_L versus temperature in air, and (f) correlation of different oxygen partial pressures in the range of 700-850 °C with R_p.

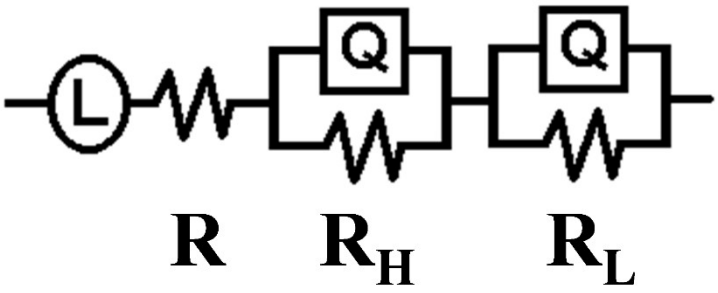

Figure S2. Equivalent Circuit Fitting Model.

Table S2. R_p value fitting results for P0.2SCF cathode at the same temperature with different oxygen partial pressures

T/℃	P_{O2} /atm	Rp/Ω·cm^2	R_H/Ω·cm^2	R_L/Ω·cm^2
700	0.1	1.0374	0.7462	0.3402
	0.21	0.889	0.630	0.2786
	0.35	0.811	0.6076	0.203
	0.5	0.752	0.5908	0.1736
750	0.1	0.3472	0.2241	0.1247
	0.21	0.2646	0.196	0.07294
	0.35	0.2254	0.1708	0.05978
	0.5	0.2058	0.1652	0.04858
800	0.1	0.2422	0.1624	0.07854
	0.21	0.1764	0.1315	0.04858
	0.35	0.1456	0.1099	0.04004
	0.5	0.1316	0.09422	0.03822
850	0.1	0.152	0.08192	0.06828
	0.21	0.098	0.06622	0.0343
	0.35	0.0826	0.05824	0.02646
	0.5	0.077	0.05446	0.02338

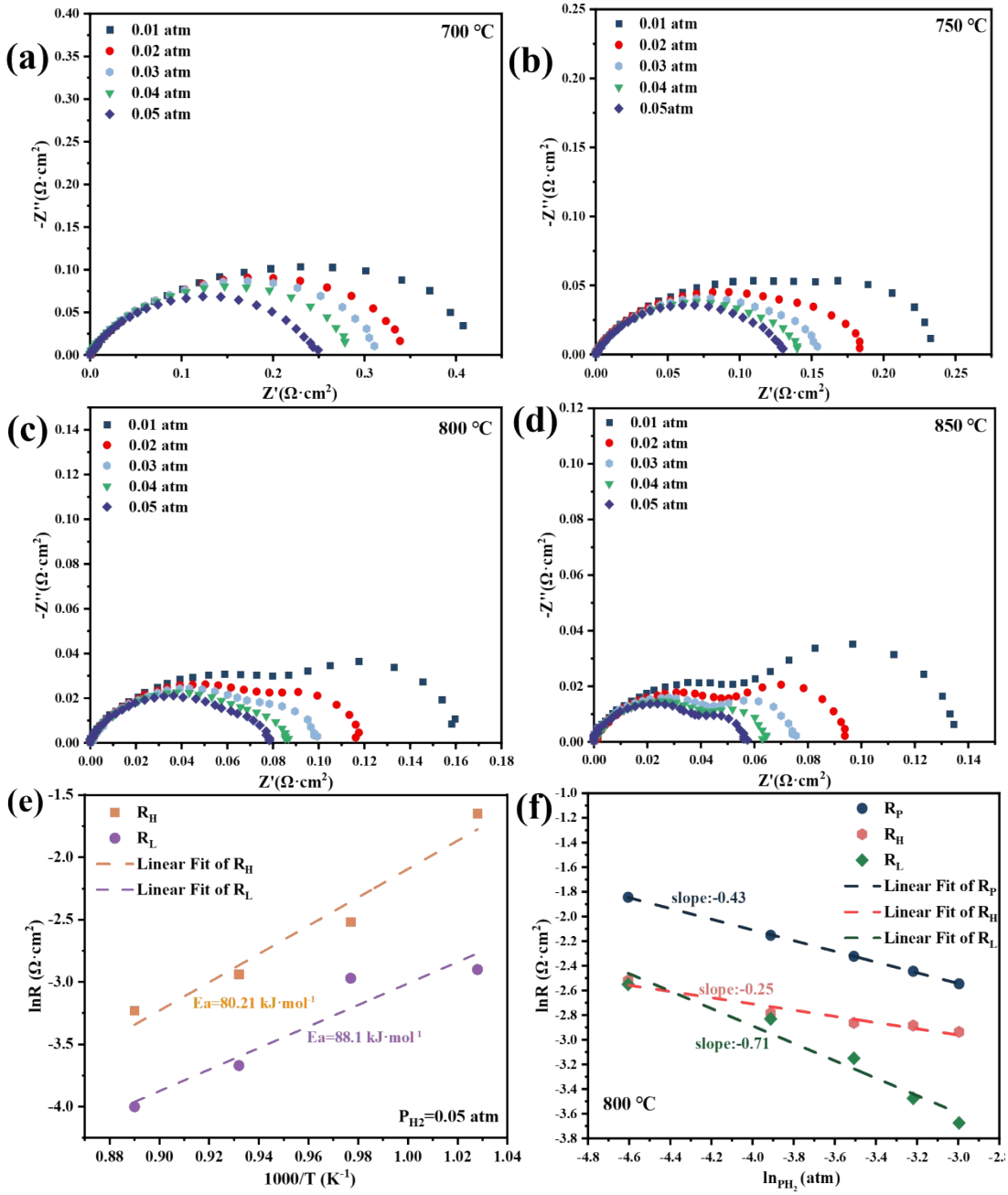

Figure S3. (a) Impedance spectra of different hydrogen partial pressures at 700 ℃. (b) Impedance spectra of different hydrogen partial pressures at 750 ℃, (c) Impedance spectra of different hydrogen partial pressures at 800 ℃, (d) Impedance spectra of different hydrogen partial pressures at 850 ℃, (e) Arrhenius plots of R_H, R_L versus temperature for a hydrogen partial pressure of 0.05 atm, and (f) Dependence of R_L and R_H on hydrogen partial pressure at 800 ℃.

Table S3. R_p value fitting results for P0.2SCF anode at the same temperature and different hydrogen partial pressures.

T/℃	P_{H2} /atm	Rp/Ω·cm^2	R_H/Ω·cm^2	R_L/Ω·cm^2
700	0.01	0.4074	0.2698	0.1402
	0.02	0.3388	0.2604	0.08862
	0.03	0.3108	0.2506	0.06874
	0.04	0.2786	0.2254	0.06272
	0.05	0.2492	0.1918	0.05390
750	0.01	0.2324	0.1376	0.1014
	0.02	0.1834	0.1050	0.08480
	0.03	0.1540	0.08806	0.07210
	0.04	0.1410	0.08512	0.05890
	0.05	0.1302	0.08008	0.05090
800	0.01	0.1582	0.08050	0.07810
	0.02	0.1162	0.06174	0.05894
	0.03	0.098	0.05710	0.04284
	0.04	0.0868	0.05586	0.03094
	0.05	0.0784	0.05307	0.02533
850	0.01	0.1344	0.07031	0.06392
	0.02	0.0938	0.05404	0.04004
	0.03	0.0756	0.04368	0.03318
	0.04	0.0630	0.04224	0.02086
	0.05	0.0574	0.03920	0.01834

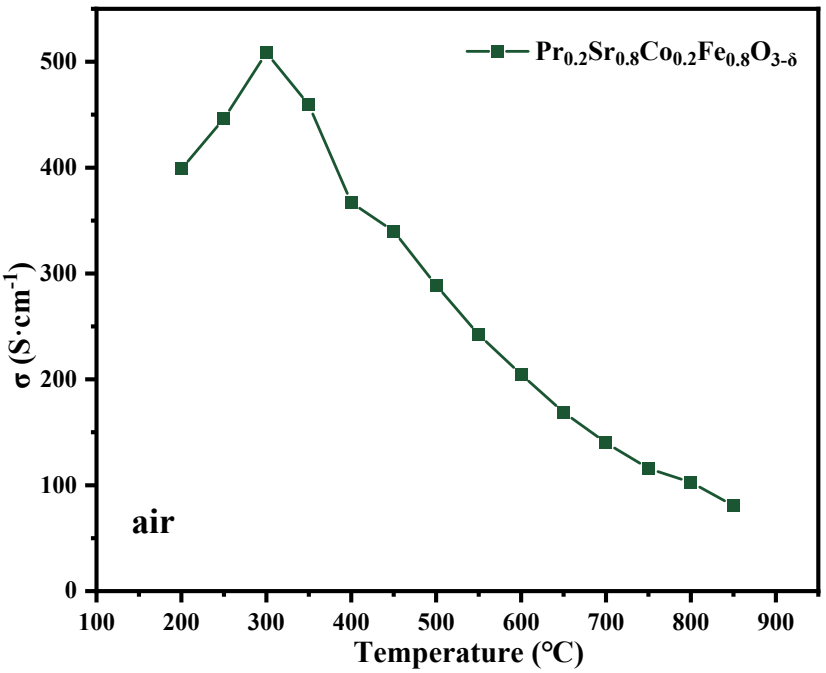

Figure S4. Conductivity (σ) versus temperature for P0.2SCF in air atmosphere.