

Electrochemical Production of Syngas from CO₂ Captured in Switchable Polarity Solvents

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Supplementary information

Table S1: Summary of collected experimental data

Current	Collected		pressure	voltage	CO	H ₂	CO ₂	CO ₂ conversion	Energy efficiency	H ₂ :CO ratio
	gas	time								
A	mL	min	psig	V	%	%	%	%	%	
0.25	300	120	20	3.8	11.4	77.3	11.6	48.9	40.0	7.0
0.50	320	60	20	4.0	20.1	67.8	11.3	64.8	38.2	3.3
0.75	390	45	20	4.1	24.3	62.1	14.2	62.4	41.5	2.6
0.75	360	45	20	4.1	22.7	54.3	14.9	67.5	29.6	1.8
0.75	360	45	40	4.1	23.7	67.3	9.4	71.2	40.4	2.9
1.00	480	30	0		0.8	65.0	31.0			
1.00	420	30	20		1.8	70.9	30.2			
1.00	350	30	20	4.2	16.3	67.0	18.1	45.3	38.0	4.5
1.00	350	30	20	4.2	19.8	63.4	16.2	55.8	38.2	3.1
1.00	420	30	0	4.2	9.4	64.3	26.1	27.0	40.6	6.7
1.00	420	30	40	4.2	26.2	63.2	10.4	71.7	37.9	2.4

Figure S1: Total CO₂ released during electrochemical experiments at 20 psig cathode backpressure

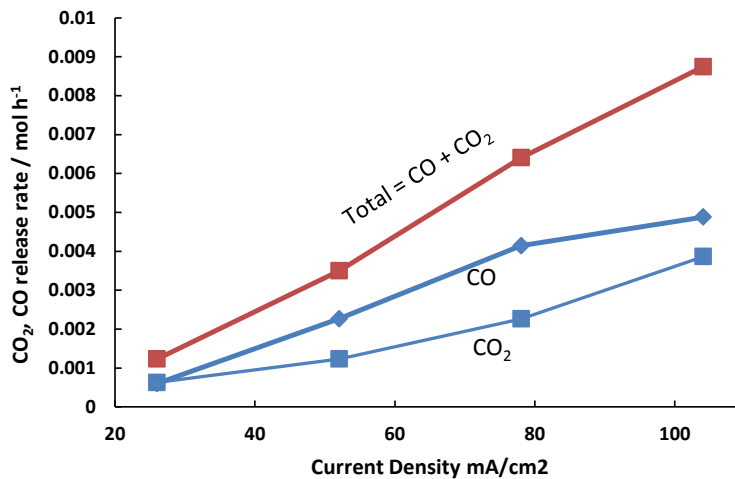
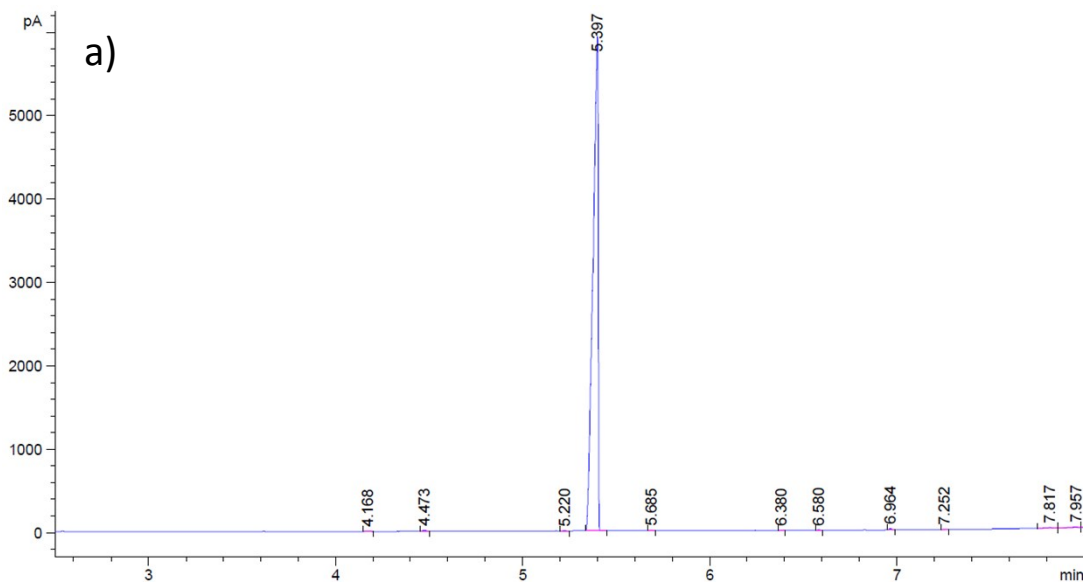


Figure S2: Chromatograms of a) fresh CHP-H₂CO₃ standard, b) aqueous phase processed catholyte at 52 mA cm⁻² (0.74 M CHP-H₂CO₃), and c) aqueous processed catholyte at 104 mA cm² (0.64 M CHP-H₂CO₃). The peak observed ca 3.5 min correspond to CHP. For the analysis the injector temperature was kept at 250 °C, while the oven was ramp from 100 °C to 300 °C. At this temperatures the CHP-H₂CO₃ is detected as CHP



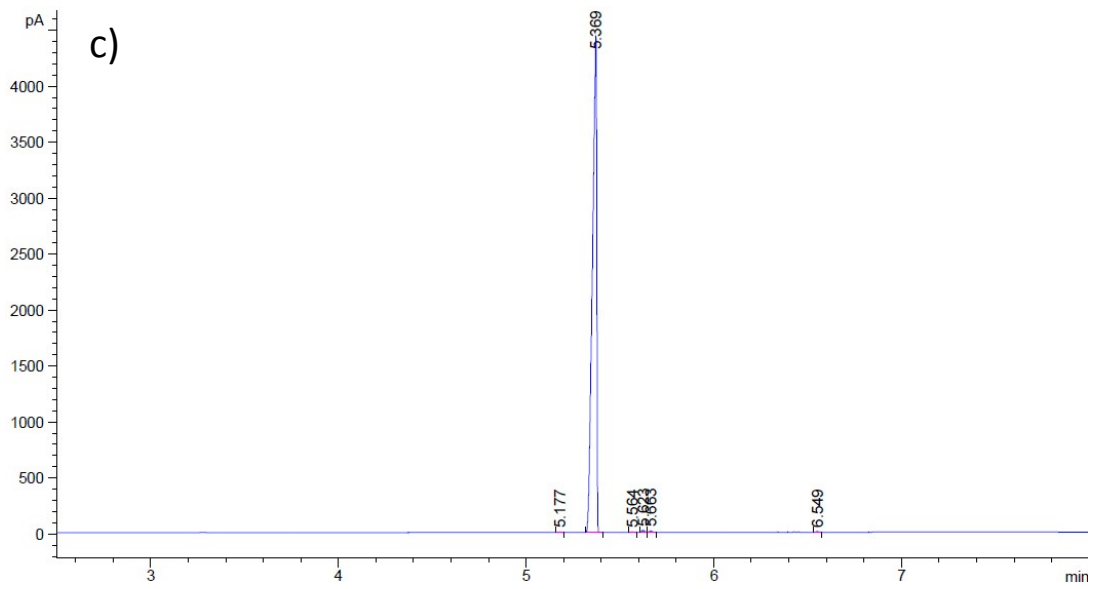
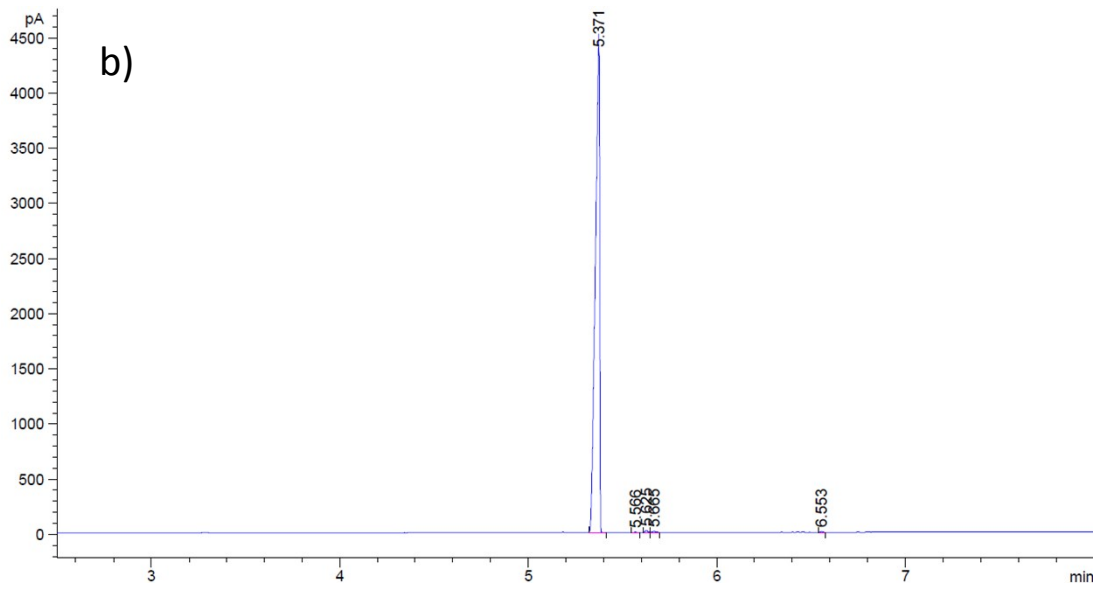


Figure S3: Estimated CHP-H₂CO₃ concentration profile during transient performance experiment

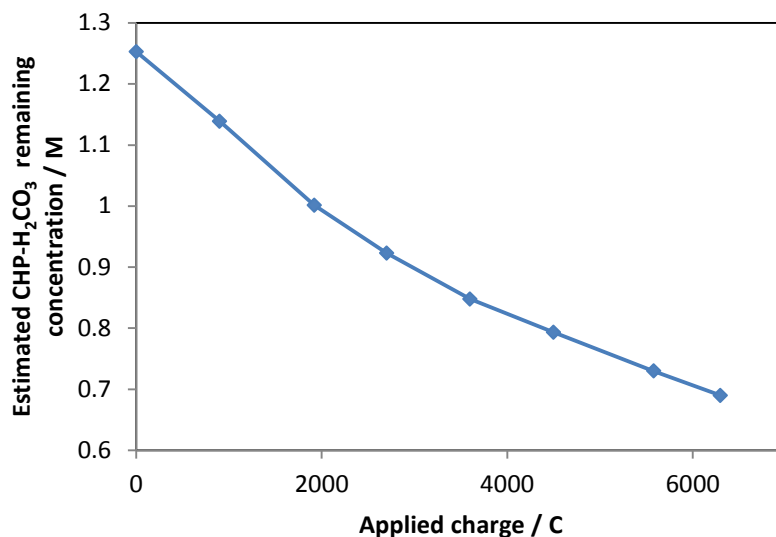
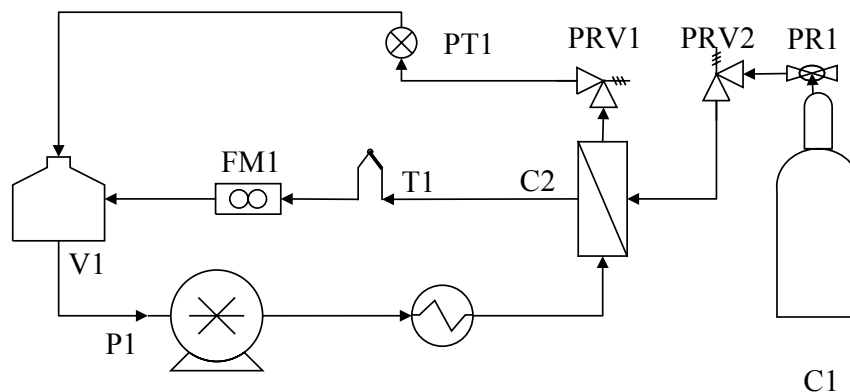


Figure S4: Experimental set-up for the capture of CO₂ with CHP



C1	CO ₂ cylinder	FM1	Flow meter	PRV2	Pressure relief valve
V1	Feed vessel	C2	Gas contactor	PRV1	Pressure relief valve
PR1	Pressure regulator	PT1	Pressure transducer	T1	Thermocouple
				P1	Pump