

Supplementary Information

Sustainable electrochemical synthesis of dry formaldehyde from anhydrous methanol

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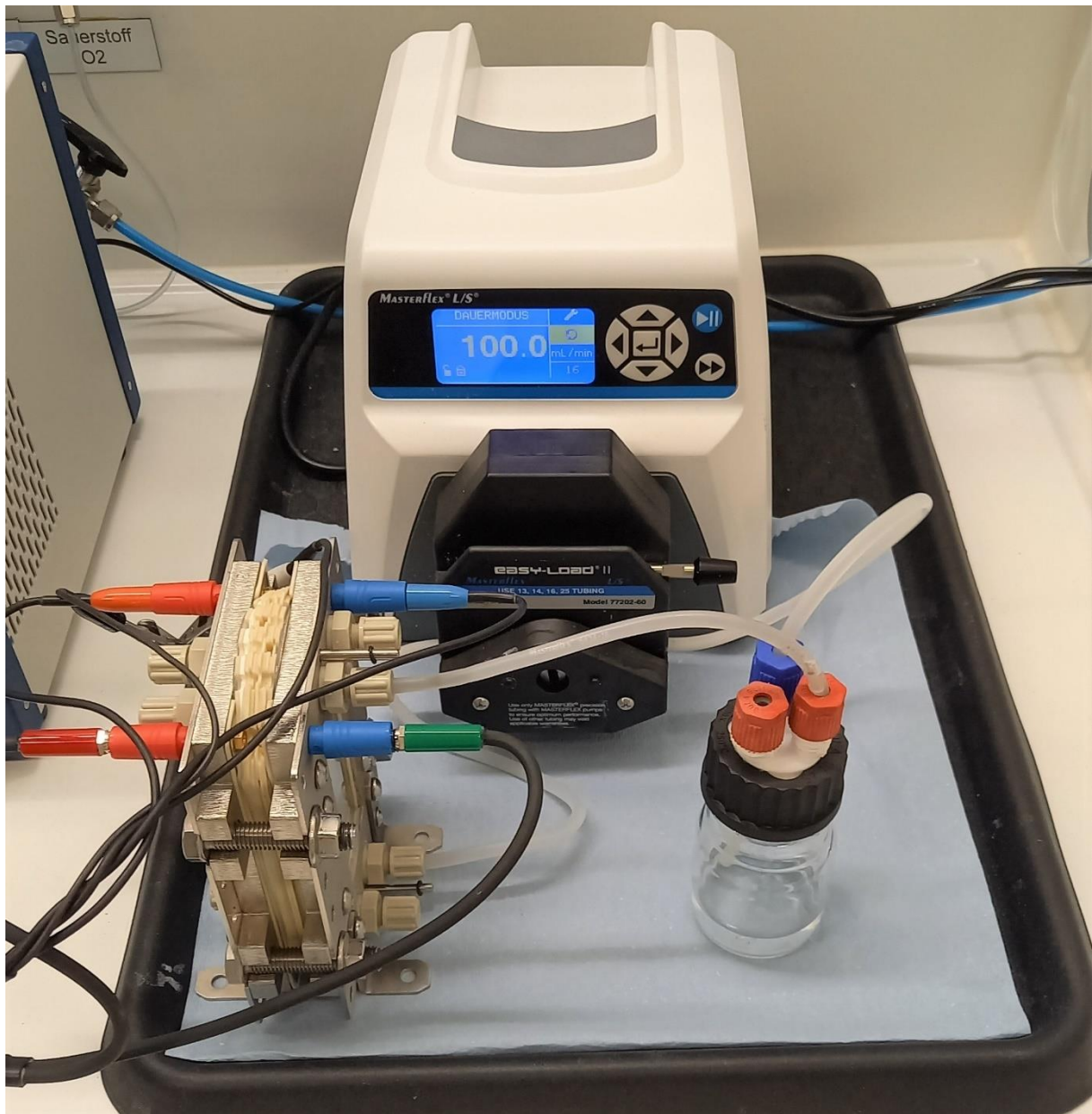


Figure S1. Picture of the used cell-setup.

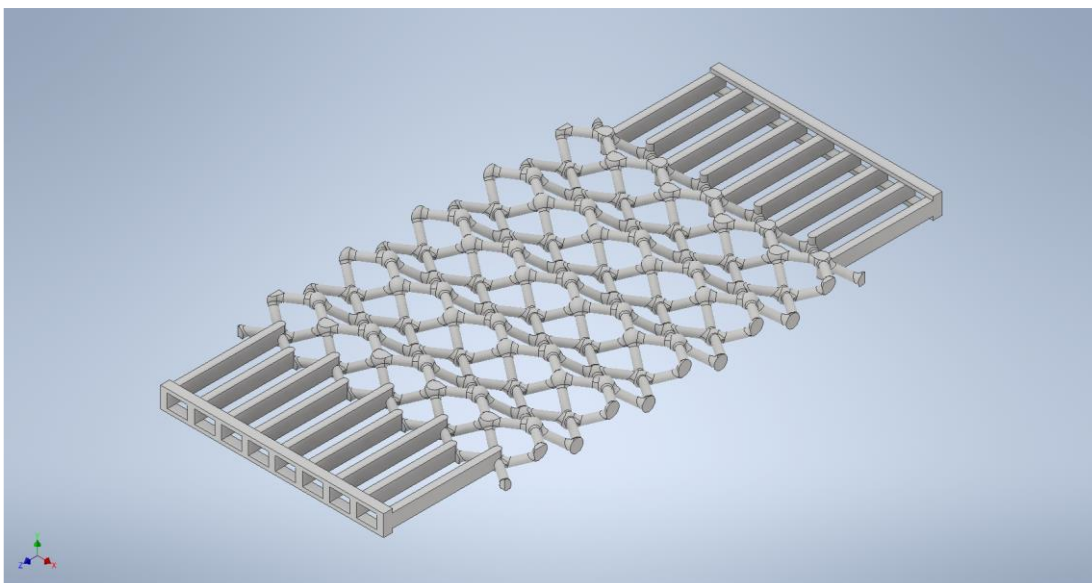


Figure S2. 3D printed turbulence promoter.

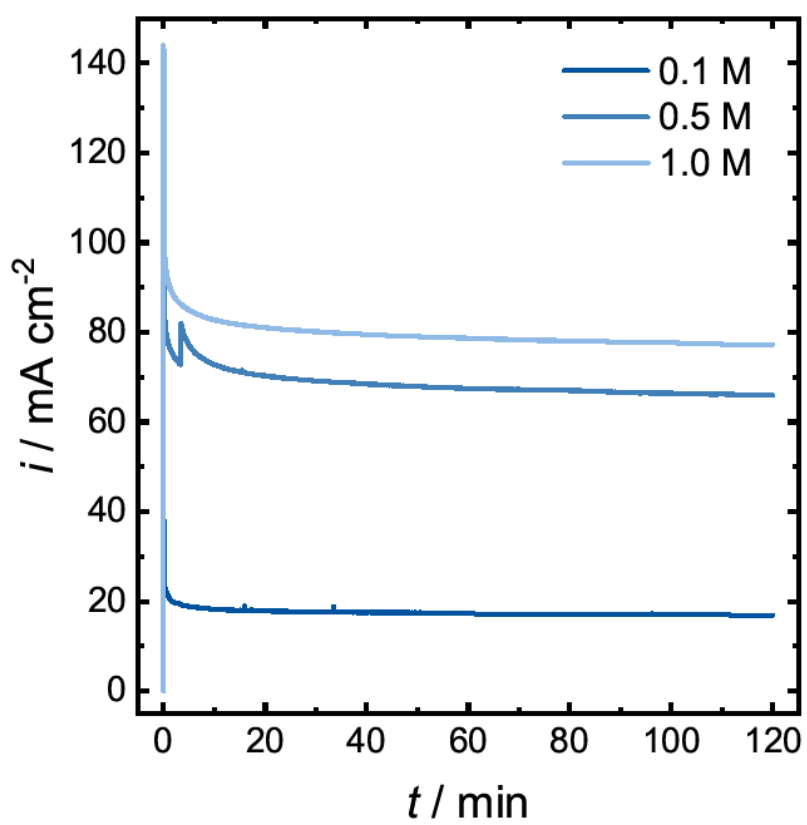


Figure S3. CVs in different NaOMe concentrations at 2.4 V vs. Fc for 2 h on a Pt working electrode in a H-cell.

Table S1. Formaldehyde and formic acid concentrations determined via HPLC for the H-cell experiments with varied electrolyte concentrations. These are single point measurements with an HPLC error of 1%.

$c(\text{NaOMe})$ mol L^{-1}	HCHO c mg L^{-1}	HCOOH c mg L^{-1}
0.1	71	7
0.5	199	13
1.0	176	113

Table S2. Formaldehyde and formic acid concentrations determined via HPLC for the flow cell experiments with varied flow rates in 0.1 and 1.0 M NaOMe.

$c(\text{NaOMe})$ mol L^{-1}	Flow rate mL min^{-1}	HCHO		HCOOH	
		c_{coverage} mg L^{-1}	c_{error} mg L^{-1}	c_{coverage} mg L^{-1}	c_{error} mg L^{-1}
0.1	10	263	10	24	9
	50	237	8	17	2
	100	247	4	20	6
	150	254	4	15	1
1.0	10	263	21	37	6
	50	261	9	37	4
	100	269	8	29	3
	150	259	37	33	1

Table S3. Formaldehyde and formic acid concentrations determined via HPLC for the flow cell experiments with varied current densities in 0.1 and 1.0 M NaOMe.

$c(\text{NaOMe})$ mol L ⁻¹	Current density mA cm ⁻²	HCHO		HCOOH	
		Coverage mg L ⁻¹	Error mg L ⁻¹	Coverage mg L ⁻¹	Error mg L ⁻¹
0.1	10	679	22	12	6
	20	1387	65	11	5
	30	2209	88	5	2
	40	3017	88	3	2
	50	3842	116	3	1
	60	4863	399	3	2
	70	5401	129	2	1
	80	6103	249	2	0
	90	6874	188	2	0
	100	7687	202	2	0
1.0	10	537	9	121	8
	20	1063	35	268	12
	30	1517	44	491	27
	40	1739	79	830	178
	50	2146	98	1115	248
	60	2560	162	1364	291
	70	3009	35	1847	43
	80	3170	23	2193	43
	90	3368	73	2450	176
	100	3789	65	2883	54