Electronic Supplementary Material (ESI) for Green Chemistry.

Scalable fabrication of multi-layered Cu-based electrodes via solvent-free method for the selective electrochemical conversion of CO_2 to C_{2+} products

Supplementary Information

Measurement setup for gas permeability

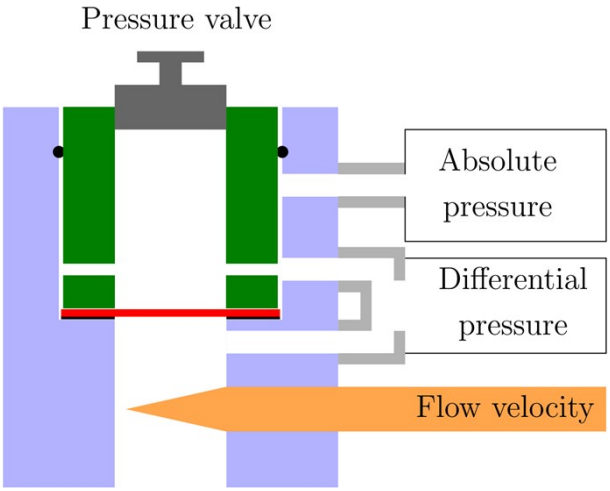


Figure S1: A schematic representation of the gas permeation measuring cell shows the electrode (highlighted in red) installed with a flat seal inside the gas-carrying channel.

Product distribution of inhomogeneous coated CL

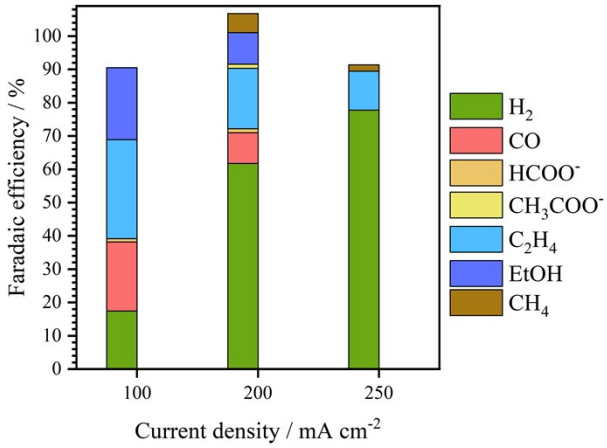


Figure S2: Product distribution of Cu-based GDE with a loading of 0.5 mg/cm^2

Fabrication of large electrodes

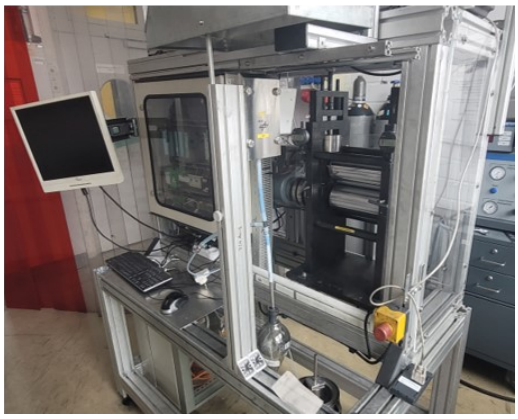
a)  **b)** 

Figure S3: a) Real image of production line. **b)** Appearance of an electrode using the proposed solvent-free method.

Critical parameters adjusted for the fabrication of GDEs

Types of carbon support in GDL	PTFE content in CL [%]	Mass loading [mg·cm^{-2}]	Rolling speed [Hz]	Heat-treatment [K]
AB	40	1	2	373
	40	1	2	473
	40	1	2	613
	40	0.5	2	613
	40	1	10	613
VC	40	1	2	613
HSAG				
AB				
AB	20			
	40			
	60			

Table S1: Elucidating key parameters during the solvent-free procedure (AB-Acetylene Black, VC- Vulcan XC 72, HSAG-High surface area graphite; Grey: Reference, state-of-the art GDEs, Yellow: Processing parameters, Light blue: GDE parameters)

Potential course during the long-term measurement

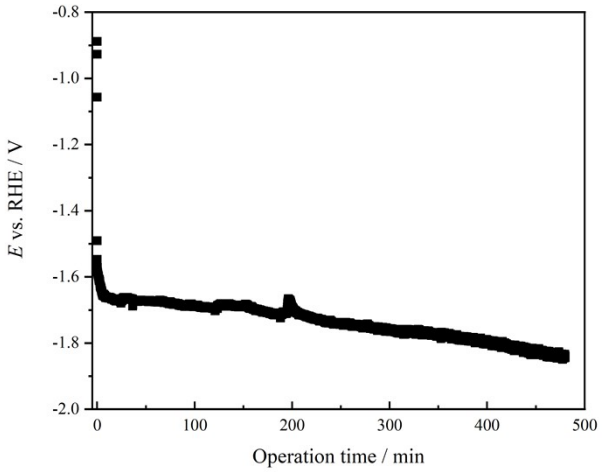


Figure S4: Potential on cathode recorded during the long-term measurement

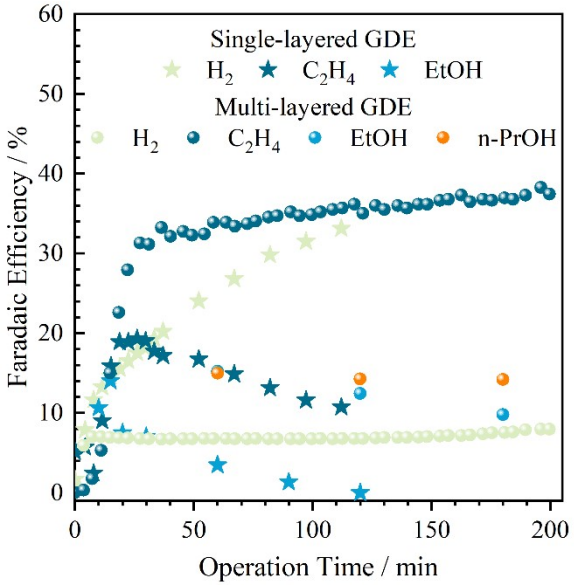


Figure S5: Comparison of stability performance of the multi- (bullet) and single-layered (star) GDE at -200 mA/cm^2 with selectivity presented.