

# Effects of supports BET surface areas on Membrane electrode assembly performance at high current loads

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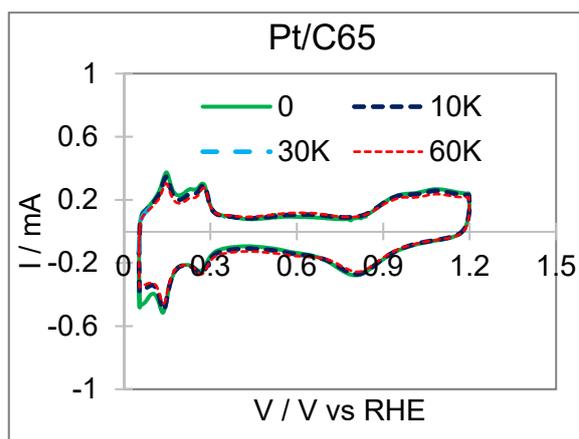
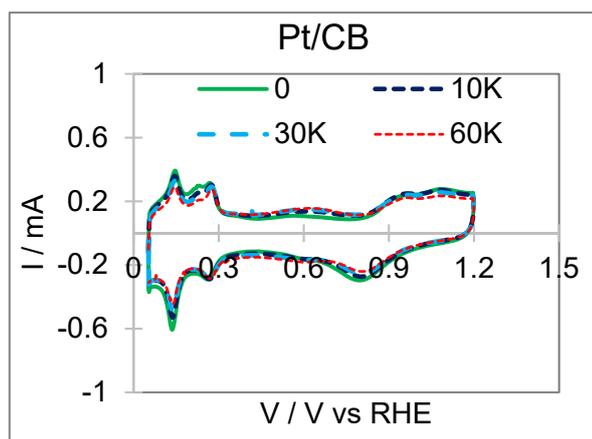
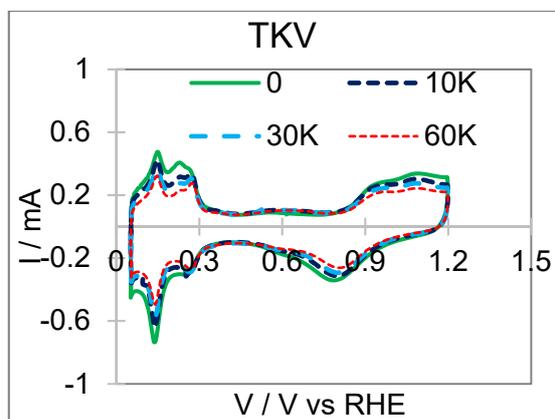
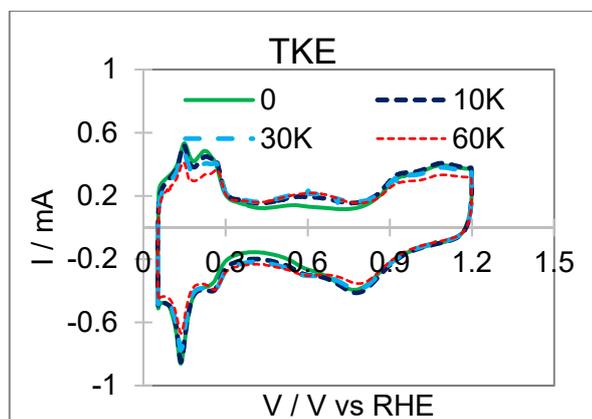
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## Supplementary Materials

**C- corrosion** : The change of CV patterns are also be an evidence of instabilities of the CB supports compared to the C65 support.



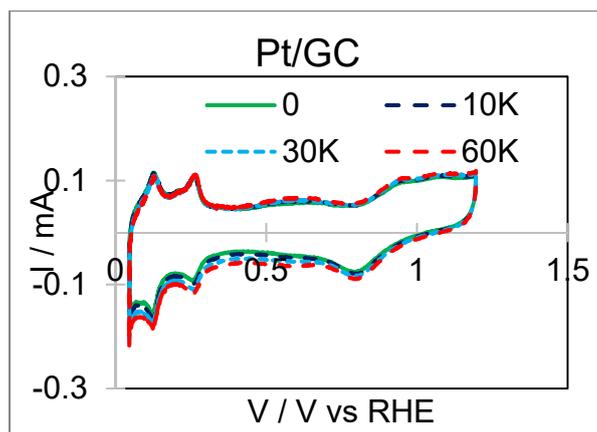


Figure S1 : Change of CV patterns of the supported catalysts after 0, 10000, 30000 and 60000 potential cycles (between 1 and 1.5V vs RHE at 0.5V/s), CVs were taken in 0.5M H<sub>2</sub>SO<sub>4</sub> 50mV/s voltage scan rate at RT

### Optimization of I/C of Pt/C65

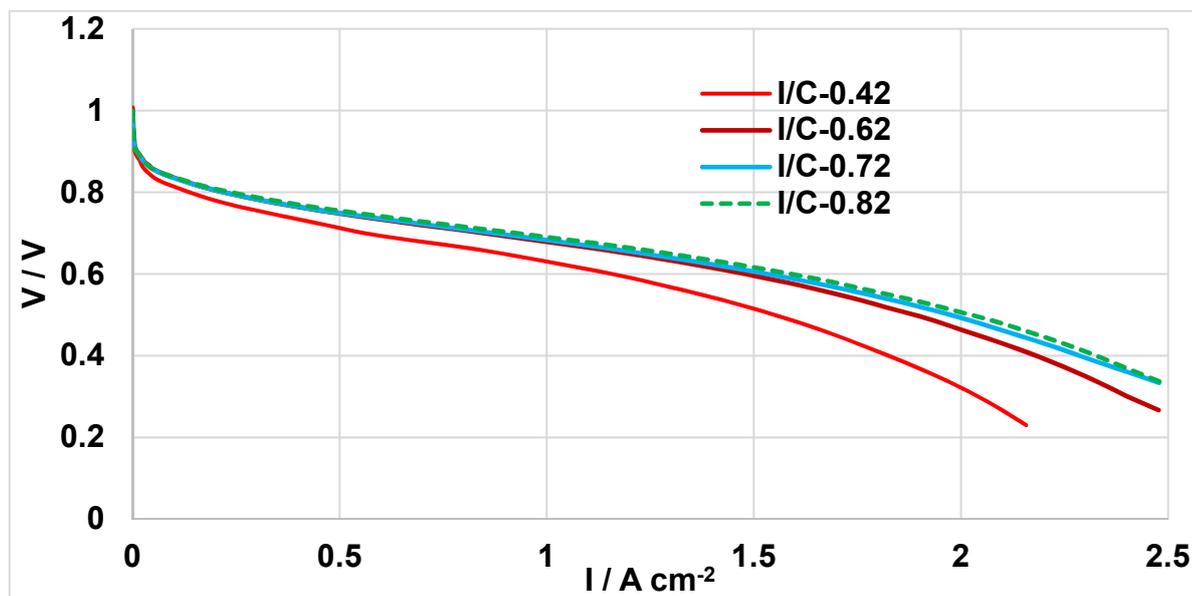
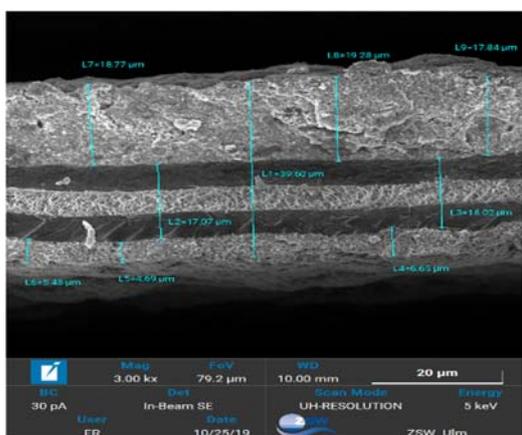
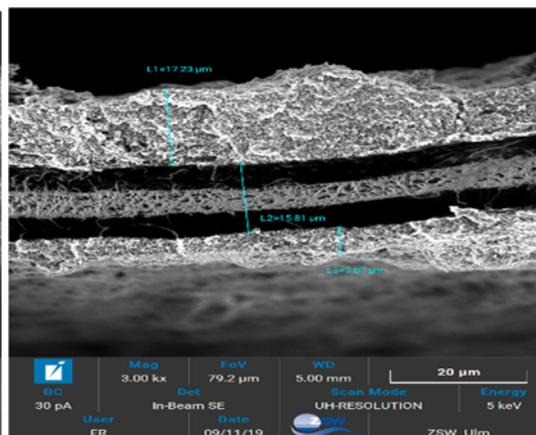


Figure S2: I/C optimization : I-V characteristics of the MEAs under cell operating temperature 80 °C, Anode and cathode dew point 80 °C, inlets 84 °C, Anode and cathode stoichiometry 1.3 and 3 respectively, and at 150 kPa.

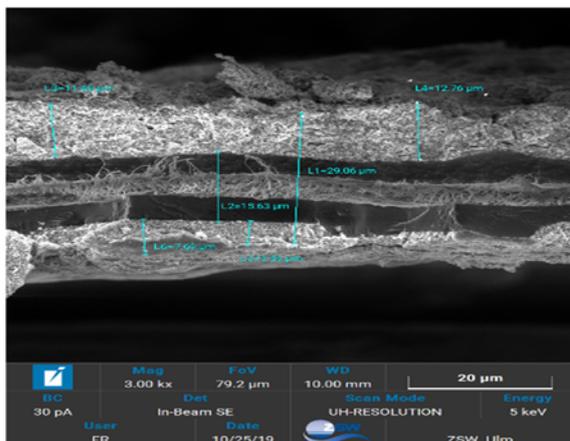
**Thickness of cathode Catalyst layers of the MEA:** FIB-SEM images reveals that the average thickness of the cathode CLs of the MEA prepared with TKE, TKV, CB and C65 were 19, 17, 12 and 16  $\mu\text{m}$  respectively (upper parts of each figures).



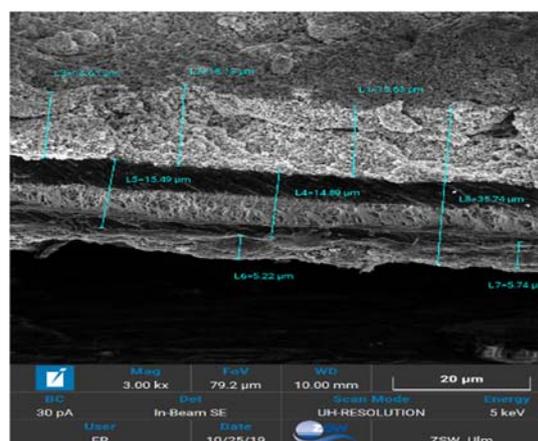
TKE



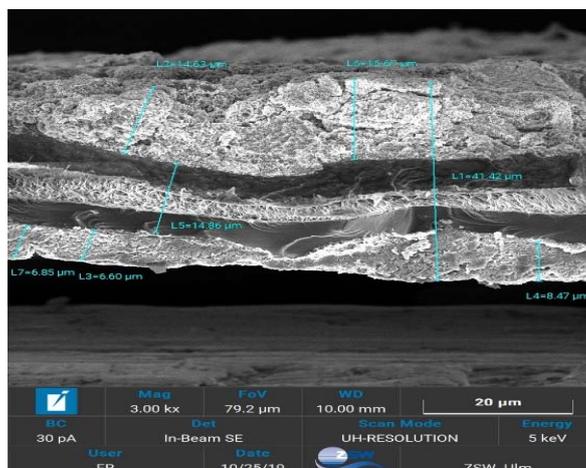
TKV



Pt/CB



Pt/C65



Pt/GC

Figure S3 : FIB-SEM images of the cathode CLs (cross section)

### MEA conditioning and testing

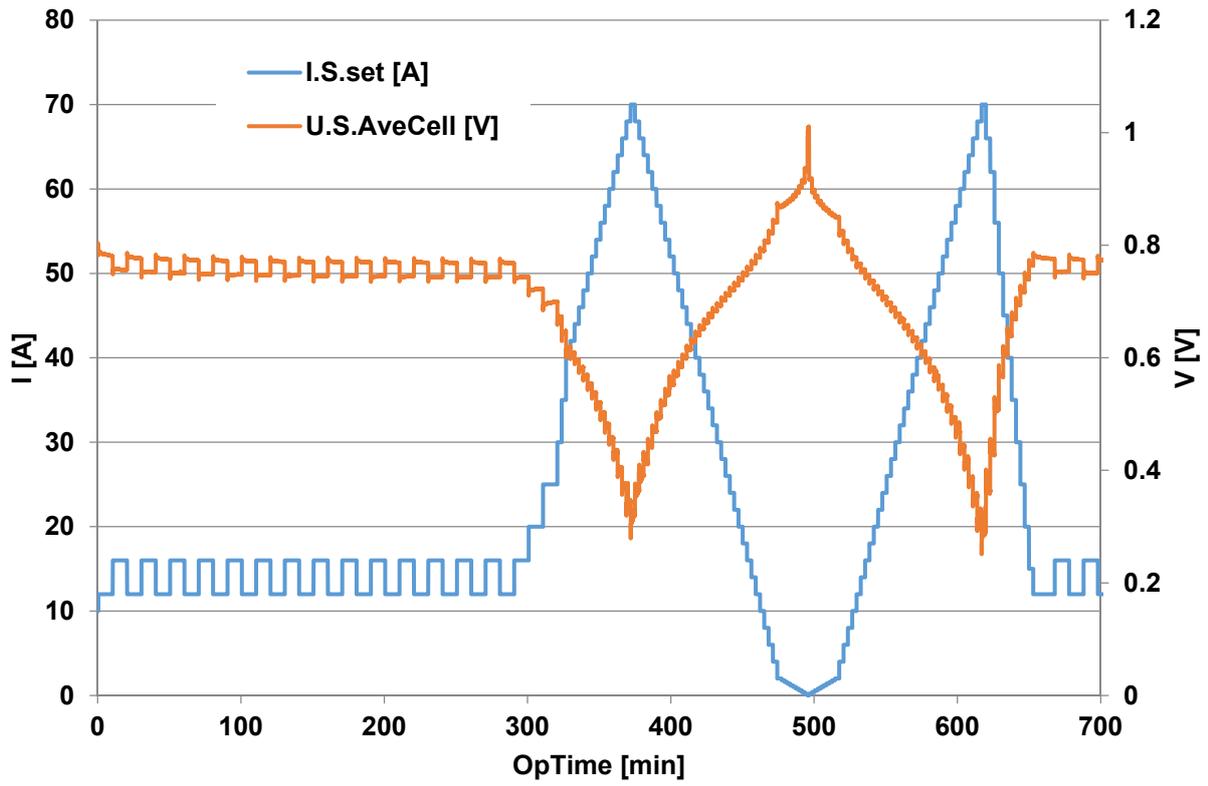


Figure S4: Example of a MEA conditioning and testing procedure

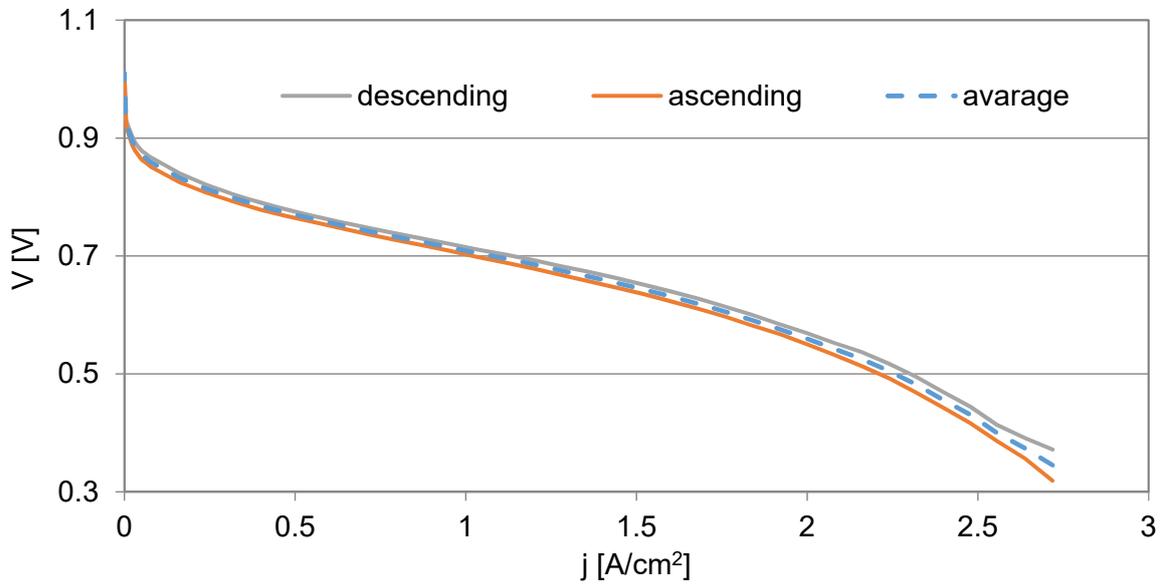


Figure S5: Example of a Polarization curve (data evaluation)