

Interfacial Control as a Strategy for Advanced Catalyst Layer Architectures in PEMFCs

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Electronic Supplementary Information

Table S1. Cell and dew point temperatures for different relative humidities.

	100%RH	60%RH	20%RH
Cell Temperature (°C)	80	80	80
Cathode dew point (°C)	80	67.9	44.8
Anode dew point (°C)	80	67.9	44.8

S1 XRF measurements.

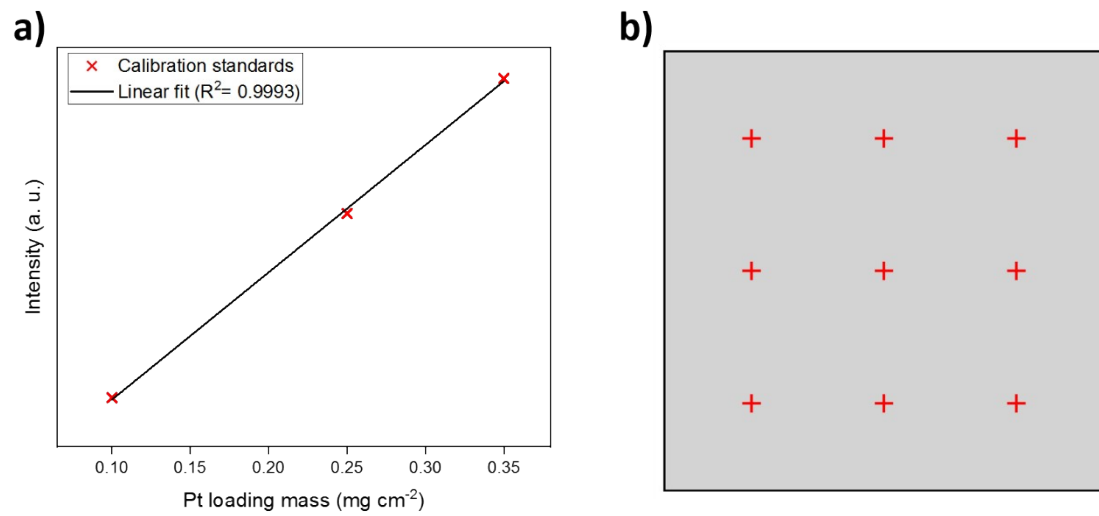


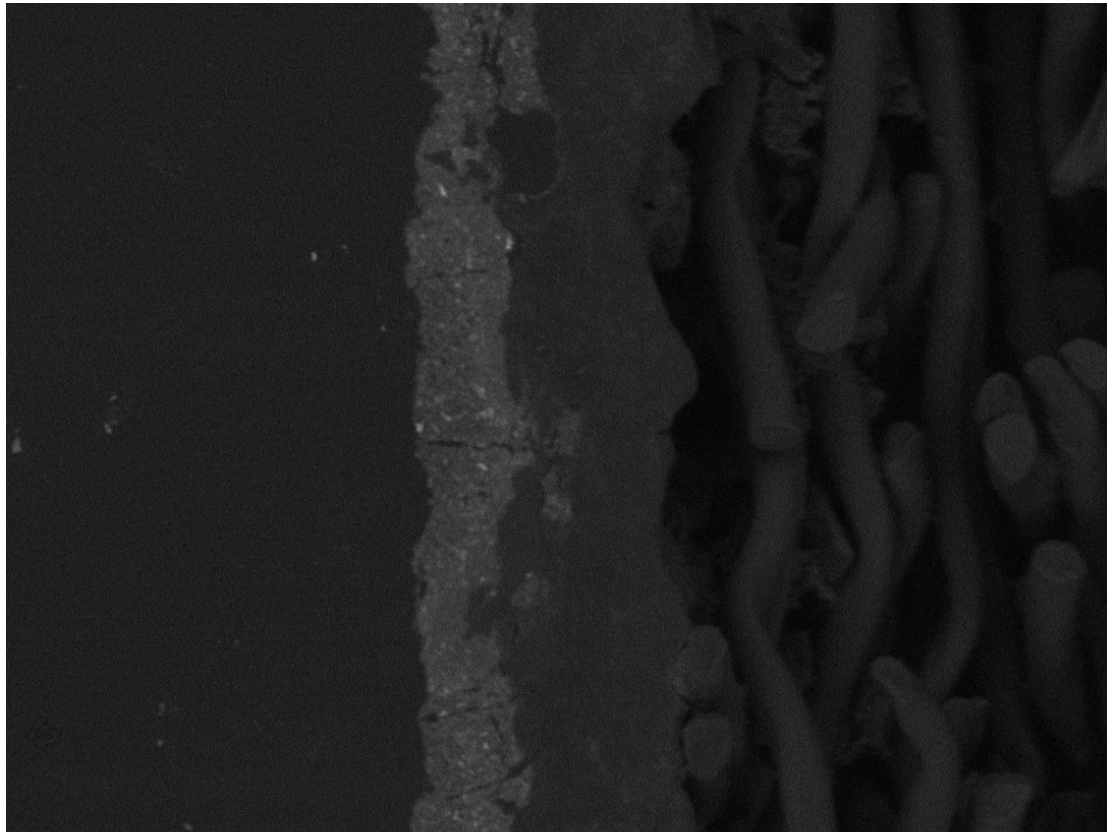
Figure S1. **a)** Example of a calibration curve using a three-point method; **b)** Top view of a $5 \times 5 \text{ cm}^2$ GDE showing the nine XRF acquisition points across the active area.

Table S2. XRF measurements for three different batches of GDEs.

Batch	GR1 (mg_{Pt} cm⁻²)	GR2 (mg_{Pt} cm⁻²)	GR3 (mg_{Pt} cm⁻²)
1	0.30 ± 0.01	0.29 ± 0.01	0.31 ± 0.02
2	0.31 ± 0.01	0.30 ± 0.01	0.29 ± 0.01
3	0.30 ± 0.02	0.30 ± 0.01	0.31 ± 0.01

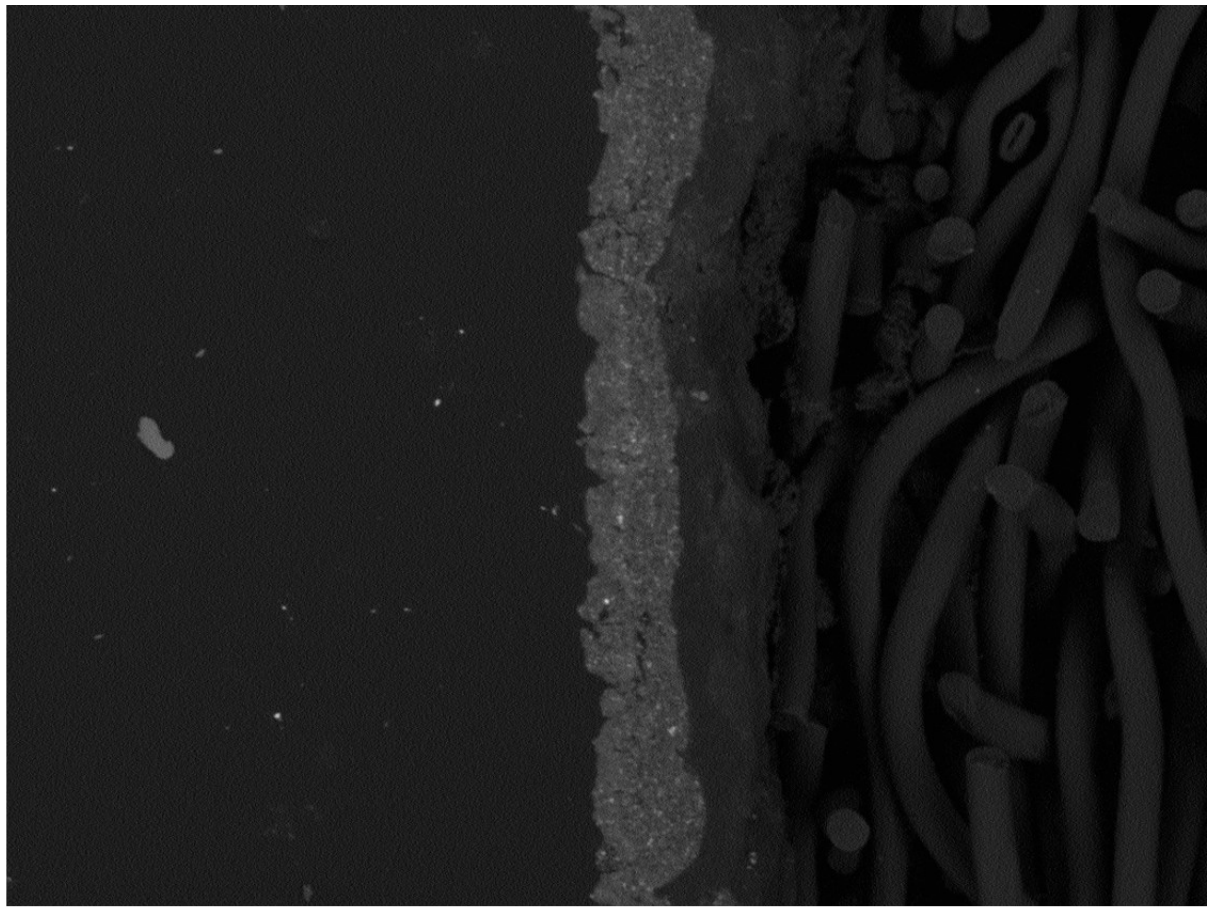
S2 GR samples SEM images at lower magnification.

GR1



50 μ m

GR2



50µm

GR3

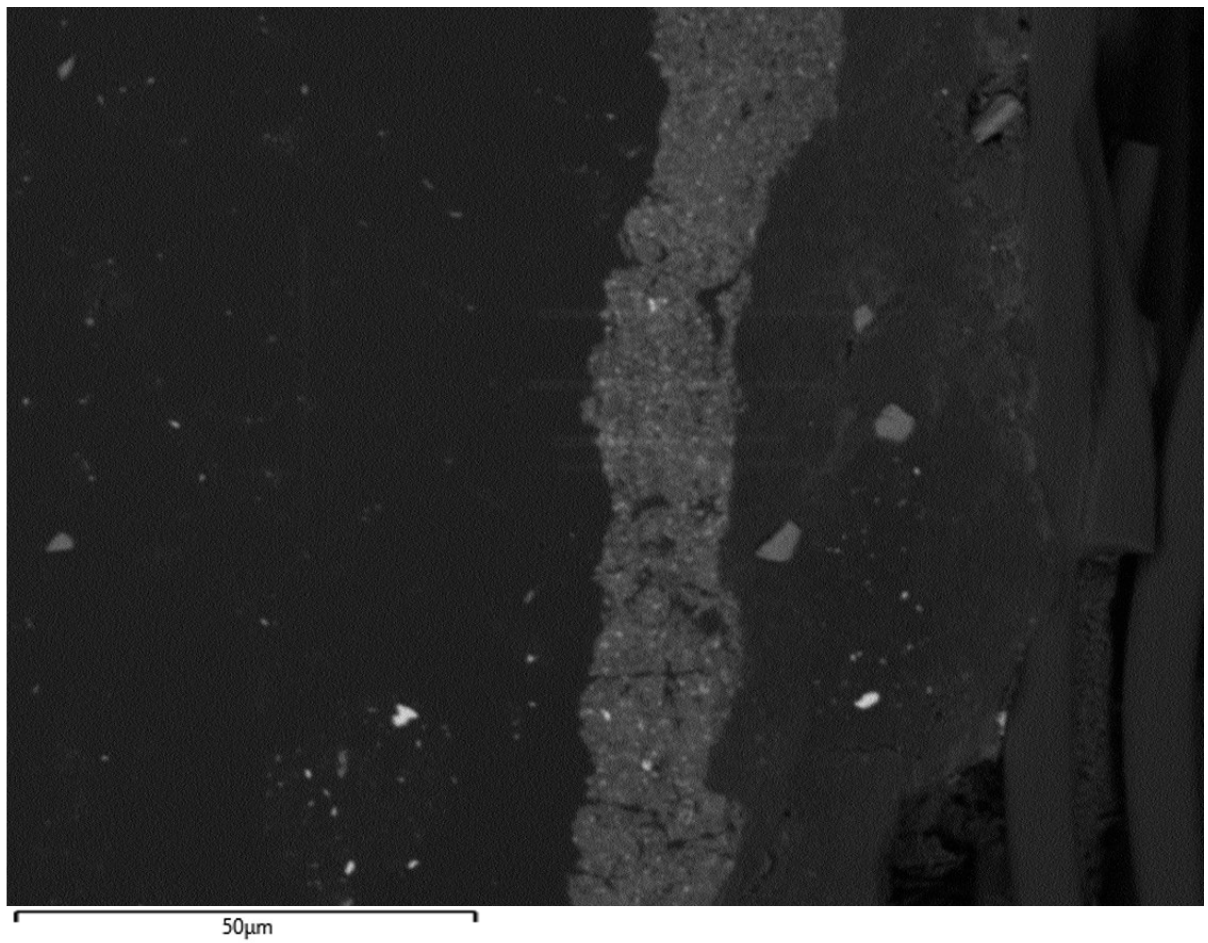


Figure S2. Lower magnification SEM images for samples GR1, GR2 and GR3.

S3 ECSA profiles for GR1, GR2, GR3, GD4 during the ADT.

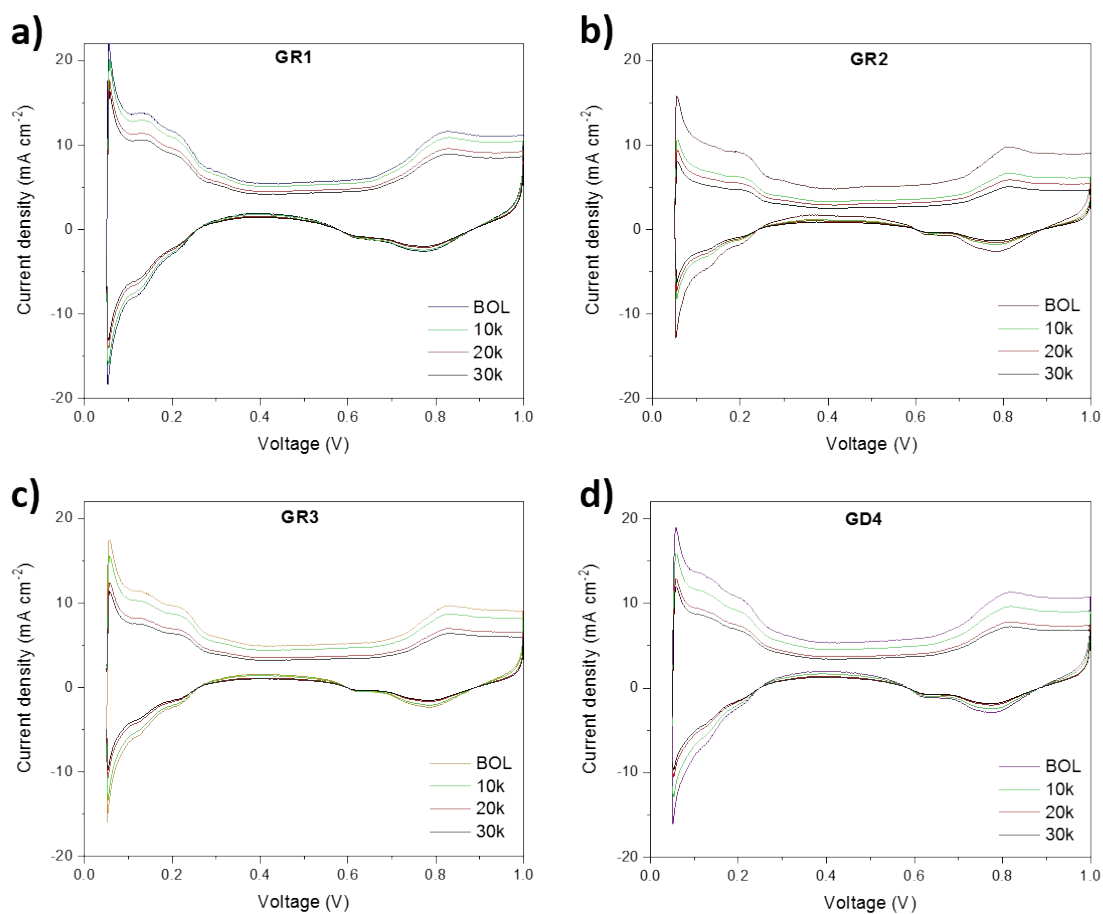


Figure S3. ECSA characterizations for 25 cm² single PEMFC, H₂/N₂ 0.2 L min⁻¹, 80°C, zero back-pressure. CVs profiles acquired, between 0.05 – 1 V with 20 mV s⁻¹ scan rate, during the AST for samples: a) GR1, b) GR2, c) GR3, and d) GD4.