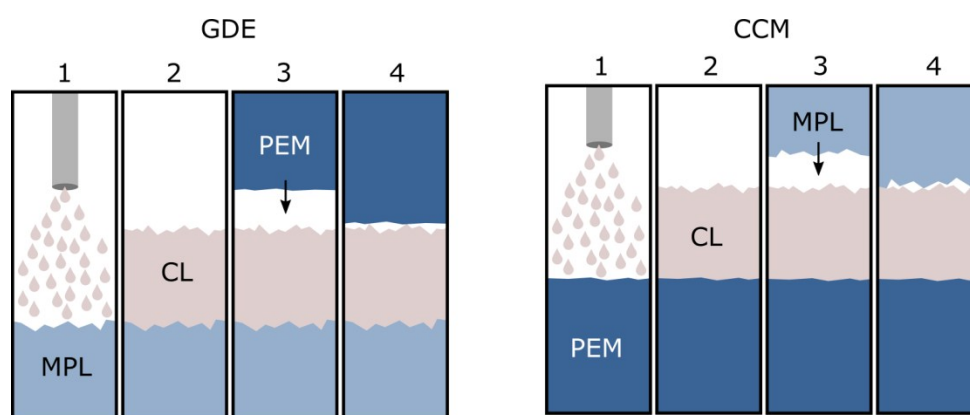


## Three-dimensional Morphology of the Interface between Micro Porous Layer and Catalyst Layer in a Polymer Electrolyte Membrane Fuel Cell

### Supplementary Information

#### CL-MPL interface and MEA fabrication processes

The CL-MPL interface strongly depends on the MEA fabrication process, which can be divided into two main groups: applying the catalyst to the gas diffusion layer (gas diffusion electrode – GDE-Figure S1 left) and applying the catalyst to the membrane (catalyst coated membrane – CCM- Figure S1 right). Consequently, when using a CCM process the CL-MPL interface is created the moment the fuel cell is assembled by pressing the MPL against the CL. It is therefore strongly dependent on the assembly itself and on the applied pressure. For the GDE processes the CL-MPL interface is created when applying the catalyst to the gas diffusion layer. The interface therefore mainly depends on the application method, e.g. spray-coating or catalyst powder deposition and not on the applied pressure during the assembly of the fuel cell. When performing ALD infiltration and FIB-SEM tomography, it is therefore to be expected that the reconstruction of a CCM structure depends stronger on the applied pressure than that of a GDE. Zhang et al. [6] give an overview of different fabrication methods.



**Figure S1** Fabrication methods for fuel cell membrane electrode assemblies can be divided into two main groups: Gas Diffusion Electrode (GDE) fabrication, where the CL is applied onto the MPL (1) and the PEM is pressed onto MPL/CL (3). The other main group comprises Catalyst Coated Membrane (CCM) fabrication methods, where the CL is spray-coated onto the PEM (1) and the GDL/MPL is pressed onto PEM/CL (3).