Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Integrated microfluidic test-bed for energy conversion devices

(Supporting Information)

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1. Diagrams of channel and electrode design of integrated microfluidic electrolyzers

The diagrams below (Figure S1) show a detailed representation of the arrangement of channels and electrodes of the microfluidic chips used in this study. They consist of 19 interdigitated channels, which contain electrodes inside them. As noticed in the diagram below, the microelectrodes patterned in the chips, were accessed through macroscopic contacts at the ends (top and bottom) of the chips.

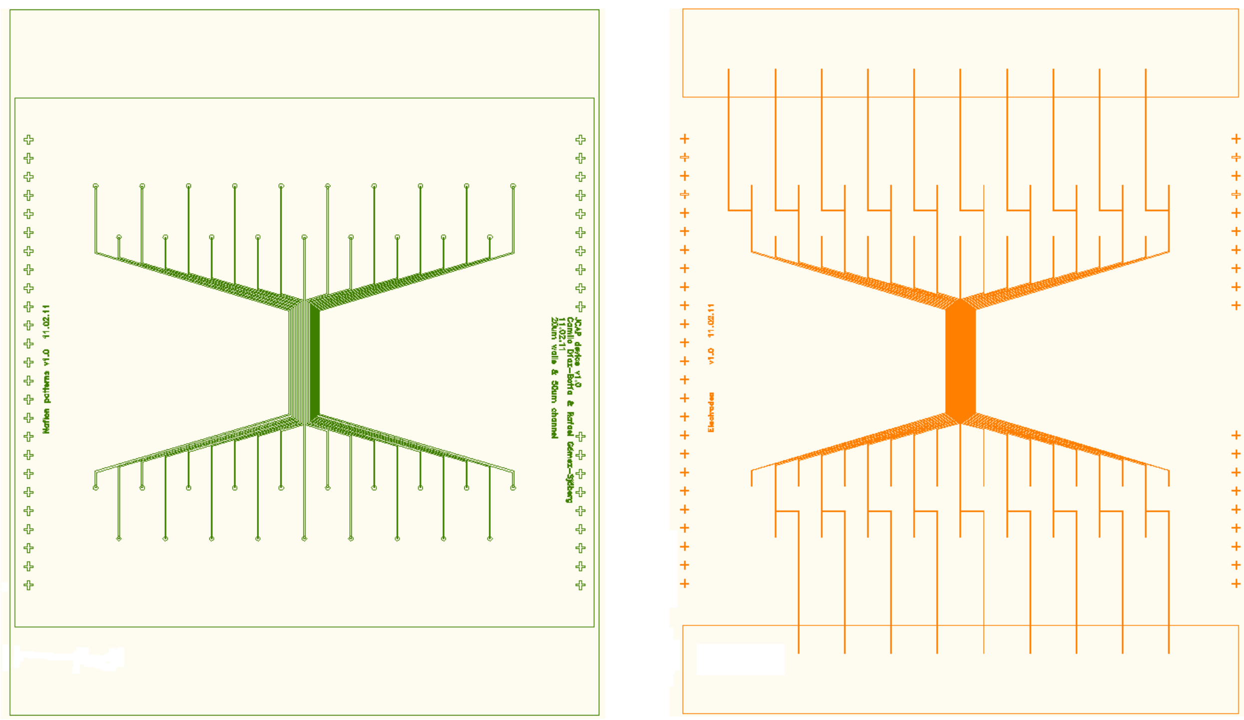

Figure S1. Diagram of channels (left) and electrodes (rights) used in the fabrication of microfluidic electrolyzer chips.

2. Cross-sectional potential profiles across microfluidic channels

As described in the main text, the dimensions in the chip were selected so that the ohmic drop across channels was negligible. The 2D potential pattern shown below was calculated for a high current density scenario (80 mA/cm^2) and demonstrates that even under those conditions the potential drop across electrodes does not exceed 10 mV.

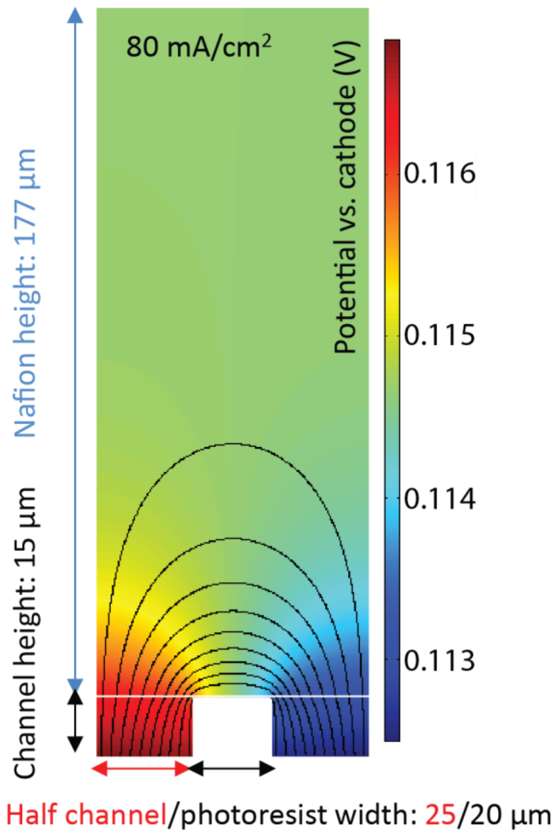

Figure S2. Potential drop pattern across two channels for a current density of 80 mA/cm^2.