

Supplementary Information

Generation of Nitrogen by means of Electrochemical Oxygen Depletion

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1. Illustration of the MEA cell and the corresponding flow field structure

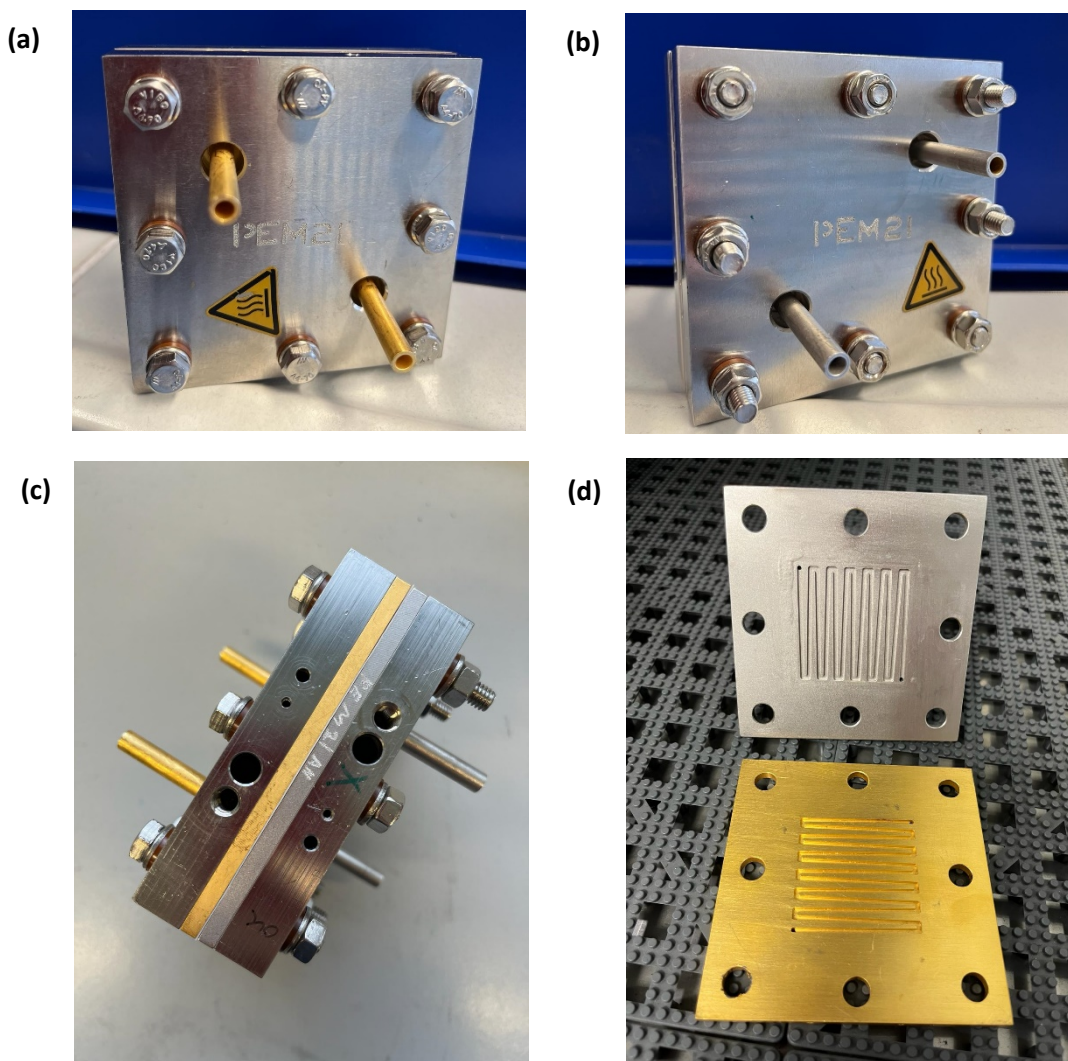


Figure 1. side view of the 17.64 cm² cell (a) cathode side, (b) anode side, (c) top view of the cell. The cell was tightened crosswise, the largest holes are for heating cartridges, second largest holes for the current connection, smaller holes for temperature sensors and voltage measurement, (d) meandering structure of the flow fields.

2. Analysis of supplied water flow rate on the anode side

Fig. 2 displays the results of the analysis of the water flow rates on the anode side. The water flow rate 5, 10 and 20 mL/min were investigated with constant air flow rate of 50 NmL/min on cathode side. In Fig. 2a, it is demonstrated that within the investigated range of rates, the water flow rate has no discernible effect on oxygen reduction. It remains constant across the examined flow rates within the accuracy range of the oxygen sensor. Furthermore, it does not impact the resulting current densities.

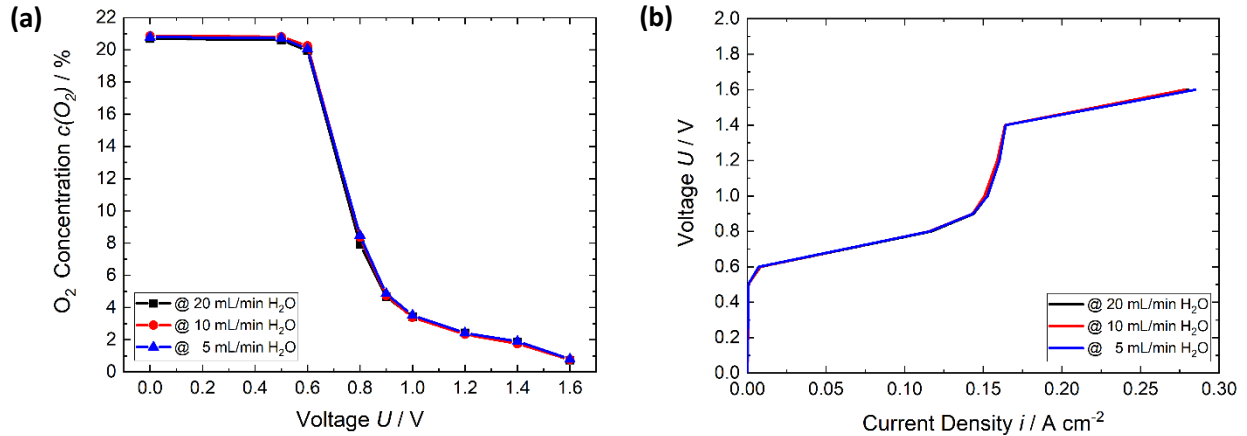


Fig. 2. (a) Comparison of the oxygen content in dependency of the water flow rate on anode side- (b) The respective voltage-current characteristic.

3. Measurement procedure of the temperature analysis

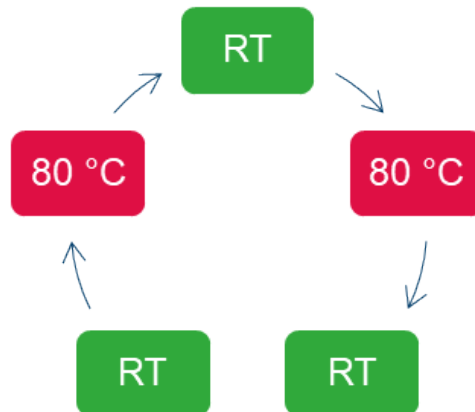


Figure 3. Schematic illustration of the measurement procedure for investigating the influence of temperature.