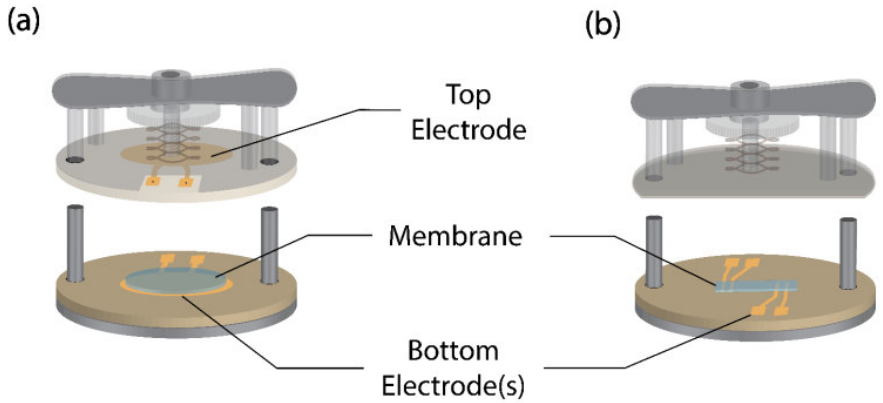
Ex-situ Ionic Conductivity Measurement of PFAS-free Membranes

Task description

As PFAS-containing membranes in fuel cell and electrolysis technologies are being phased out, research into PFAS-free membrane synthesis is rapidly developing. To be considered suitable for these technologies, membranes must exhibit a high ionic conductivity, among other characteristics.

The ex-situ measurement of membrane materials requires thoroughness and precise sample handling. Factors such as electrolyte concentration, sample compression or sample size can strongly affect the reproducibility of the results.

The goal of this bachelor thesis is to establish best practices for measuring the ionic conductivity of pre-selected PFAS-free membranes. This includes producing reproducible results in both Through-Plane and In-Plane configurations.



Direct contact methods for ion-conductivity measurements

a) Through-Plane and b) In-Plane

Assignments

- Literature research: Membrane materials in PEM technologies, ex-situ membrane conductivity measurement (2 weeks)
- Sample preparation and conductivity measurement (4 weeks)
- Data reduction and method comparison (3 weeks)
- Results presentation and thesis report writing (3 weeks)

Start: as of now

Duration: ca. 3 months

Contact: Julie Salme, M.Sc., salme@hycenta.at

DI Michael Richter, richter@hycenta.at