

**Synthesis and characterization of sulfonated
Polyethersulfone-cardo proton exchange
membranes**

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Sulfonated Polyethersulfone cardo proton exchange membranes were prepared by reaction with concentrated sulfuric acid. We have prepared four different membranes according to the reaction time of sulfonation. For each membrane, we have measured the ionic conductivity in 0.2 M HCl aqueous solutions at 30, 40, 50 and 60°C, water uptake in demineralized water and Ion Exchange Capacity (IEC). The tested membranes are highly conductive: the conductivity of the most conductive material varies from $0.22 \Omega^{-1} \cdot \text{cm}^{-1}$ at 30 °C to $0.31 \Omega^{-1} \cdot \text{cm}^{-1}$ at 60 °C and the ion exchange capacity varies from 0.97 to 1.71 meq./g of dry polymer. The ionic conductivity, at a given temperature, grows sharply with the reaction time of sulfonation. On the other hand, the water uptake in distilled water is very high. At 30°C, the water uptake varies from 17 to 180 % as a function of reaction time. The prepared proton exchange membranes are stable and have good mechanical properties.