

Phosphoric acid doped polysulfone membranes with aminopyridine pendant groups and imidazole cross-links - DTU Orbit (08/11/2017)

Phosphoric acid doped polysulfone membranes with aminopyridine pendant groups and imidazole cross-links

Udel polysulfone based membranes with 4-aminopyridine pendant groups and cross-linking imidazole units are synthesized in a simple two step reaction. The ratio of 4-aminopyridine and imidazole is varied and the materials are extensively characterized. The average phosphoric acid uptake (in 85 wt% PA) ranges between 90 wt% and 452 wt% depending on the ratio of 4-aminopyridine and imidazole and the membranes show good proton conductivity of up to 65 mS cm⁻¹ at 160 °C under non-humidified conditions. The applicability of these materials as a polymer electrolyte membrane was proven by single cell tests at 130 °C. The relationships between PA uptake, chemical composition and mechanical stability are reported. Proton conductivity and mechanical properties only depend on the phosphoric acid content, which, however is a function of the chemical composition.

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