

Synthesis and characterization of sulfonated-fluorinated poly(biphenylene)ether membranes for fuel cell applications

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A PFCB-containing biphenylene ether polymer was synthesized and sulfonated using chlorosulfonic acid and then cast into membranes from their solutions for fuel cell applications. Sulfonation reactions were carried out by changing the molar ratio of chlorosulfonic acid and the PFCB-containing biphenylene ether polymer under fixed time and temperature. The resulting sulfonated polymers showed different sulfonation degree (SD), ion exchange capacity (IEC), and water uptake. With the increment of the content of chlorosulfonic acid, the SD, IEC, water uptake of the sulfonated polymer membranes increased. The ion conductivity of the sulfonated PFCB-containing biphenylene ether polymers was compared with that of Nafion 115.