

Phosphoric acid-doped porous poly(imide benzimidazole) membranes for high temperature fuel cell

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The development of high-temperature polymer electrolyte membrane fuel cell (HT-PEMFCs, working at 150–200 °C) is one of the highlighted fuel cell technologies worldwide in order to solve some of the problems of current cells based on Nafion[®]. The proton conductivity of phosphoric acid (PA) doped polybenzimidazole membranes highly depends on the acid doping level (ADL) of the membranes. However, the mechanical strength of the PA doped PBI membrane is dramatically reduced as the ADL increases, due to the strong plasticizing effect of PA. In this study, the porous polyimides membranes containing benzimidazole were prepared to improve mechanical strength as well as to increase the ADL for high proton conductivity. The the porous polyimides membranes containing benzimidazole were investigated in terms of ionic conductivity, ADL, FT-IR, mechanical strength, etc.

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