

A Study on Preparation and Fuel Cell Performances of Hydrocarbon Polymer Electrolyte Pore Filling Membranes for Polymer Electrolyte Fuel Cells

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Novel hydrocarbon polymer electrolyte pore-filling membranes were prepared for polymer electrolyte fuel cells. The pore-filling membranes were polymerized with several crosslinking agents and were characterized on the properties for employing to polymer electrolyte fuel cells. Various porous hydrocarbon base substrates were also used for the preparation of pore-filling membranes. The proton conductivities of polymer electrolyte membranes prepared in this work were determined by the composition ratio of an electrolyte monomer and crosslinking agents used for polymerization. Furthermore, the properties of the prepared pore-filling membranes were significantly dependent on degree of crosslink even though various types of crosslinking agents were employed. However, these pore-filling membranes have commonly excellent properties such as smaller dimensional change when swollen in solvents, higher mechanical strength, lower fuel crossover through the membranes, and easier preparation process than those of traditional cast membranes.