

The Effect of Crosslinking with the Hydrophilic Group on Sulfonated Polyimide for Polymer Electrolyte Membrane Fuel Cell

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To investigate the effect of crosslinking by hydrophilic group on sulfonated polyimide electrolyte membrane, sulfonated polyimide end-capped with maleic anhydride was synthesized using 1,4,5,8-naphthalenetetracarboxylic dianhydride, 4,4'-diaminobiphenyl, 2,2'-disulfonic acid, 2-bis [4-(4-aminophenoxy)phenyl] hexafluoropropane and maleic anhydride. The sulfonated polyimides end-capped with maleic anhydride were self-crosslinked or crosslinked with poly(ethylene glycol) diacrylate. A series of the crosslinked sulfonated polyimides having various ratio of sulfonated polyimide and poly(ethylene glycol) diacrylate were prepared and compared with uncrosslinked and self-crosslinked sulfonated polyimides. The synthesized sulfonated polyimide films were characterized for FT-IR spectrum, thermal stability, ion exchange capacity, water uptake, hydrolytic stability, morphological structure and proton conductivity.

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