

Sulfonated polyimide membranes functionalized by charge transfer complex formation

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Improvement of functions of polymer electrolyte membranes such as durability has been strongly required for practical usage of PEFC. Stabilization of the membranes by cross-linking polymers has been studied in order to suppress the solubility of the polymer membrane. However, the process requires complicated synthesis. We have been approaching the problem from a different point of view. We used sulfonated polyimide (SPI) as a polymer electrolyte membrane, and prepared charge-transfer (CT) complex polymer membrane by using supramolecular chemistry technique. Hybrid membrane consisting of SPI as an electron acceptor and dihydroxy naphthalene as an electron donor were prepared by solvent cast method. The obtained membrane was confirmed formation of CT complex by UV-vis spectroscopy. Mechanical property and proton conductivity of the hybrid membrane have been evaluated, and effect of CT complex formation to the membrane properties has discussed.