

## Preparation and characterization of Nafion/basic polymer complex membrane for DMFC application

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The most significant feature of PFSA (perfluorosulfonic acid) membrane is its high proton conductivity. This property comes from the unique structure of PFSA membrane. As water is absorbed in membrane, its hydrophilic domain size becomes bigger. Water and methanol can penetrate membrane through water channel and it can also provide the passage of proton. The main drawback of PFSA membrane is methanol permeability. Strong sulfonic acid of PFSA membrane induces considerable phase separation and thus results in big size of hydrated cluster and water passage. Nafion is one of the PFSA membrane. Nafion 5wt% solution, the solvents are alcohol and water, is evaporated and then recast Nafion is prepared. We modified Nafion, using basic polymer (PEI, P4VP). Nafion/basic polymer complex membranes decreased the size of hydrated cluster. Water uptake decreased with increasing basic polymer. Thermal properties were investigated using TGA. Both proton conductivity and methanol permeability decreased with increasing the concentration of the basic polymer.