

## The Structural Effect on Proton Conductivity and Methanol Permeability of Sulfonated Polymer Membrane for DMFC

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Perfluorinated grafted ionomers, such as Nafion®, are well known potentials materials as polymer electrolyte applied in DMFC due to their good proton conductivity and chemical/ hydrolytic stability. Even if these advantages, they have high cost, high methanol permeability and steep reduction of proton conductivity at high temperature.

From the standpoint of high methanol crossover and their high cost, alternative polymer electrolyte membranes are ealgerly desired, and major research objective in recent would be to identify and achieve novel, high performance, effective proton conductive electrolyte with low methanol crossover and low cost.

In this study, novel high performance proton exchange membranes having proton conductivity close to that of Nafion® while having modified lower methanol permeability were prepared by introducing sulfonated monomer using fuming sulfuric acid in aromatic polymer backbone. The structural effect on proton conductivity and methanol permeability were investigated for linear rigid rod, grafted and crosslinked sulfonated polymers, respectively.