

Abstract Submitted
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Development of Polymer Electrolyte Membrane (PEM) from Bisphenol S for Direct Methanol Fuel Cell (DMFC) SAIRUNG CHANGKHAMCHOM, ANUVAT SIRIVAT TEAM¹ — The currently used Proton Exchange Membrane (PEM) in a Direct Methanol Fuel Cell (DMFC) is Nafion[®], an excellent proton conductor in a fully hydrated membrane. However, it has major drawbacks, such as very high cost, and loss of conductivity at elevated temperature and low humidity. In this work, a novel PEM based on sulfonated poly(ether ether ketone) (S-PEEK). Poly(ether ether ketone) (PEEK) was synthesized by the nucleophilic aromatic substitution polycondensation of Bisphenol-S and 4,4'-difluorobenzophenone for system A, and Bisphenol S and 4,4'-dichlorobenzophenone for system B. Bisphenol-S helps to increase the thermal stability due to its high melting point (245°C). The post-sulfonation reaction was performed by using concentrated sulfuric acid. Sulfonated poly(ether ether ketone) (S-PEEK) samples were characterized by FTIR and ¹H-NMR to confirm the chemical structure of the S-PEEK, and by TGA to investigate the thermal property.

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