Sulfonated poly(arylene ether ketone) electrolyte membranes cross-linked via proton conductive cross-linker for enhanced conduction and stability

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Poly(arylene ether ketone) was synthesized containing pendant carboxylic groups which can produce a series of Cross-linked Sulfonated Poly(arylene ether ketone). Sulfonate groups were only attached on the diamino cross-linker and pendant amino naphthalene to obtain proton conductivity and limit the harmful degradation of sulfonate groups to the main chain makes it more stable on working condition. And sulfonated cross-linker was applied to enhance proton conductivity, mechanical properties and lower the water uptake. Proton conductivity, water uptake, mechanical properties, thermal stability and cell performance were investigated to evaluate the properties of the CSPAEK membranes for fuel cell application.