The pendant sulfonated poly(arylene ether ketone) electrolyte membrane for all vanadium redox flow battery application

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In this study, we developed poly(arylene ether ketone) (PAEK) containing pendant sulfonation group as proton conductor for the membrane of all vanadium redox flow battery system. Sulfonated PAEK with flexible side chain were prepared by polycondensation of 4,4-Difluorobenzophenone with 2,2-Bis(3-amino-4-hydroxyphenyl)hexafluoropropane and Bisphenol-A, followed by post-sulfonation using 1,4-butanesultone. We confirmed the structure by using H-NMR, FT-IR and analyzed molecular weight using GPC. The physical properties of membrane such as water uptake, ion exchange capacity were investigated for their applications in all vanadium redox flow battery system.