

**Ternary hybrid (SPEEK/SPVdF-HFP/GO) based membrane electrolyte for the applications of fuel cells: profile of improved mechanical strength, thermal stability and proton conductivity**

**Supporting information**

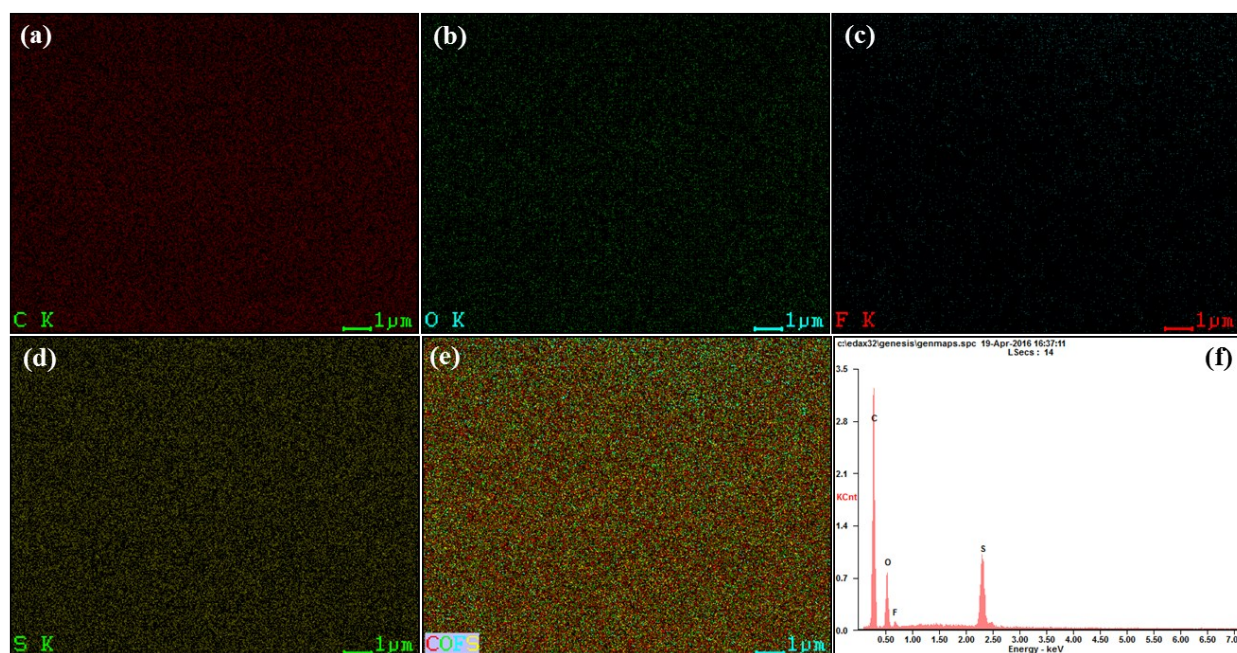


Fig. S1(a–e) Elemental mapping images of SPSPVG-5 membrane and (f) EDS analysis of SPSPVG-5 membrane.

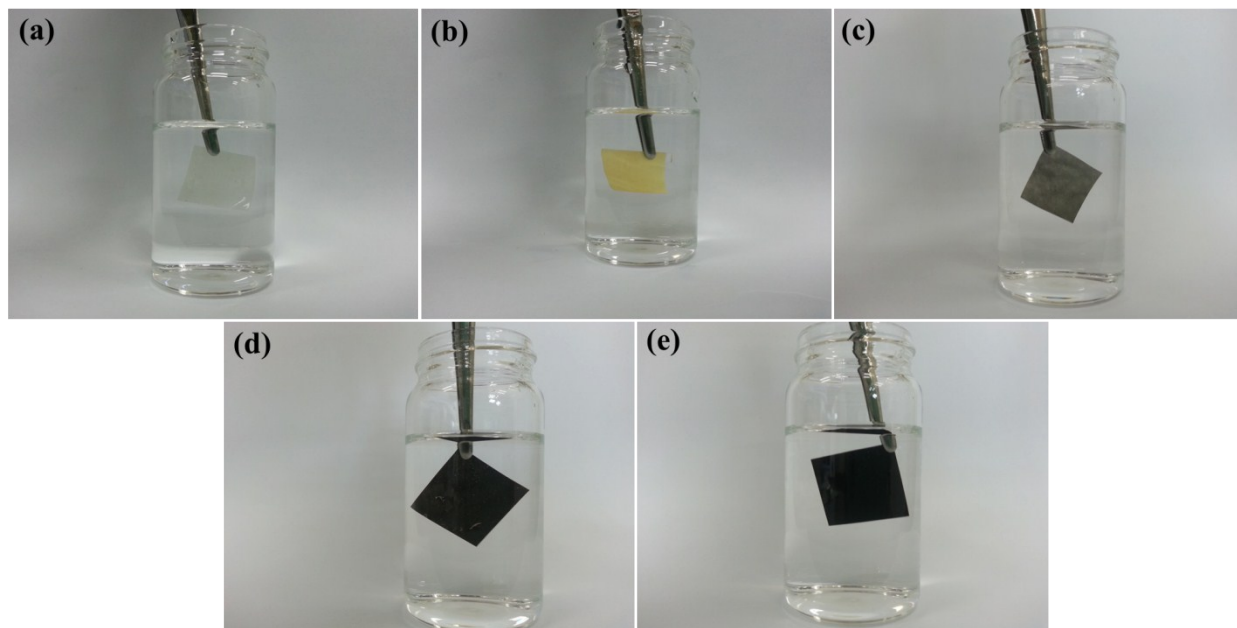


Fig. S2(a–e) Optical photographs of membranes of (a) SP, (b) SPSPV, (c) SPSPVG-1, (d) SPSPVG-3, and (e) SPSPVG-5.

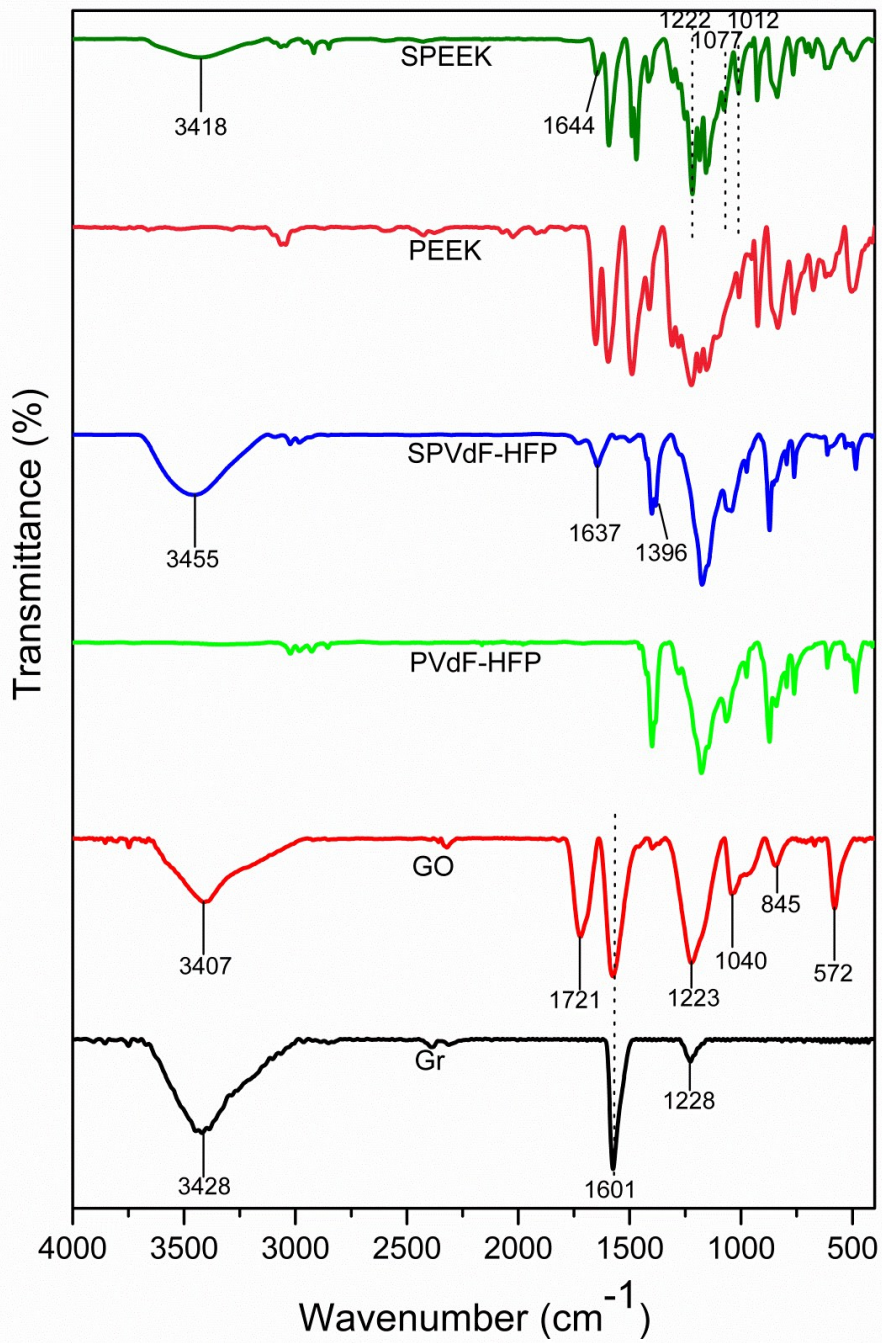


Fig. S3 FT-IR spectra of Gr, GO, PVdF-HFP, SPVdF-HFP, PEEK, and SPEEK.

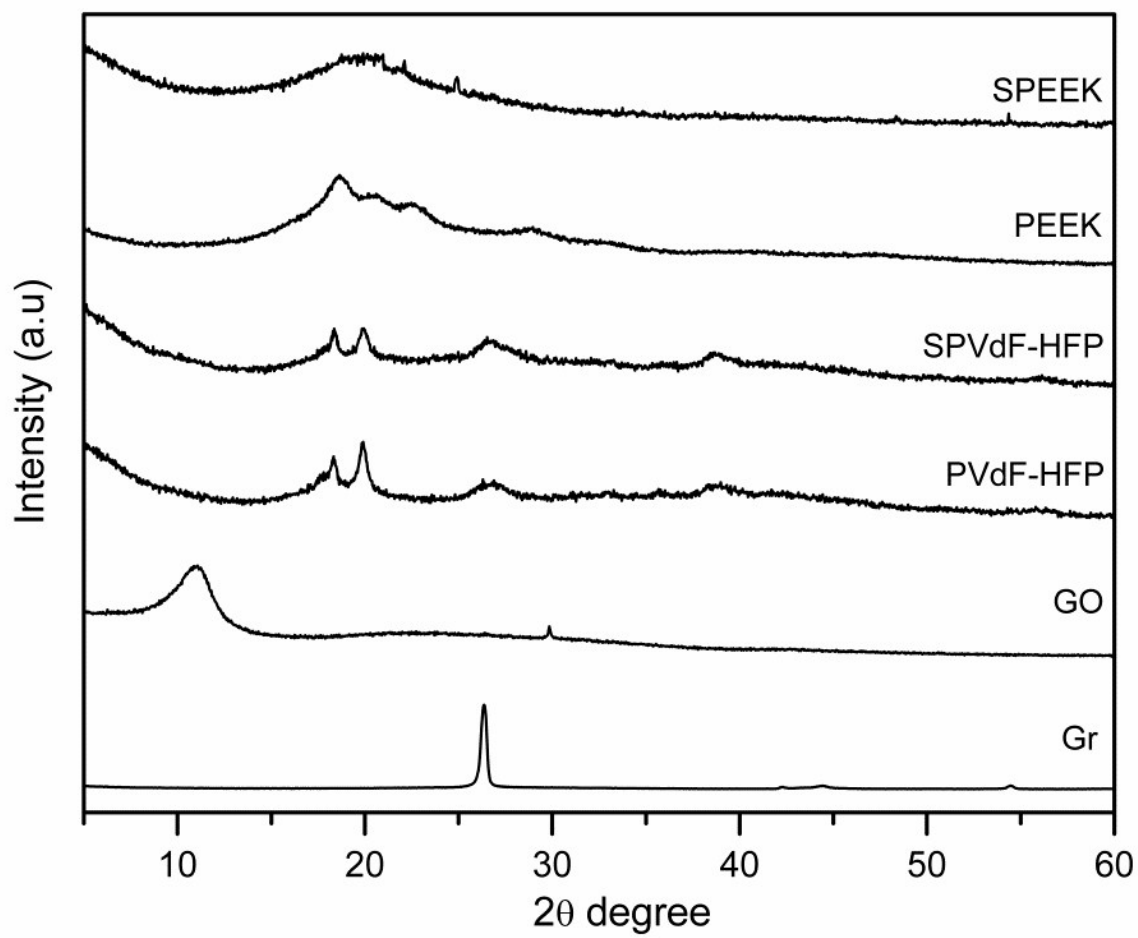


Fig. S4 XRD patterns of Gr, GO, PVdF-HFP, SPVdF-HFP, PEEK, and SPEEK.

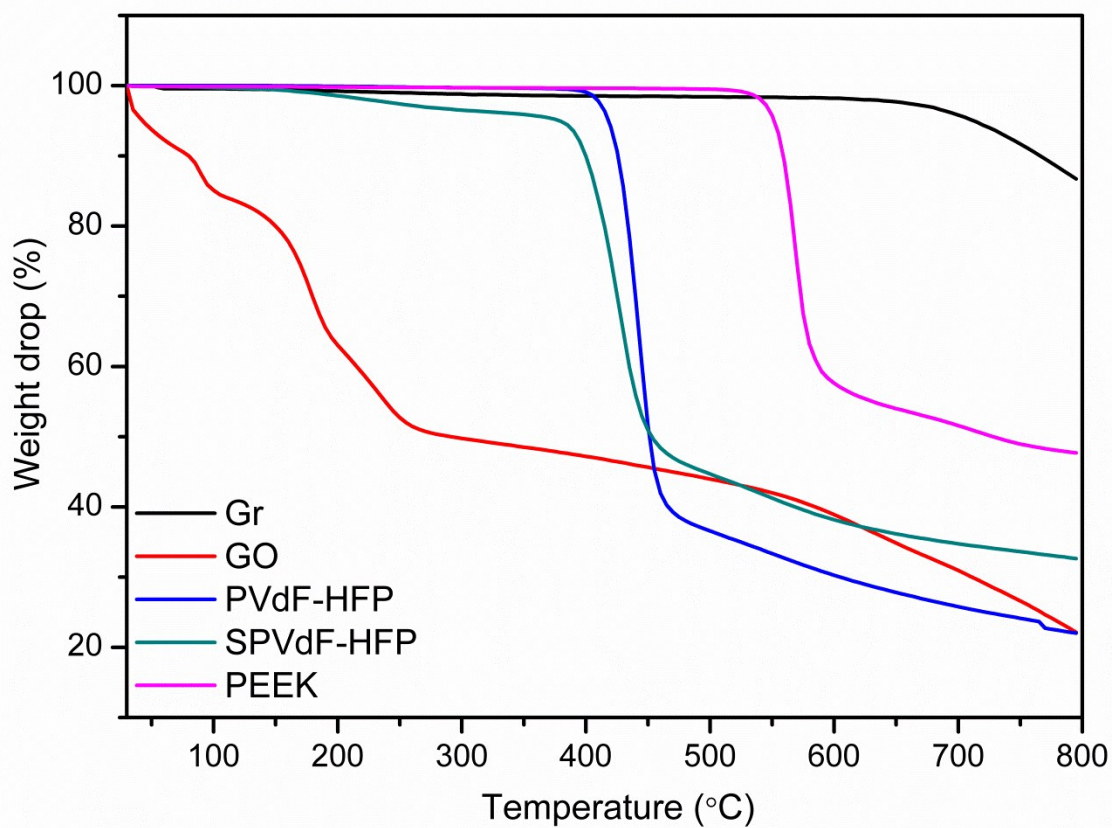


Fig. S5 TGA curves of Gr, GO, PVdF-HFP, SPVdF-HFP, and PEEK.



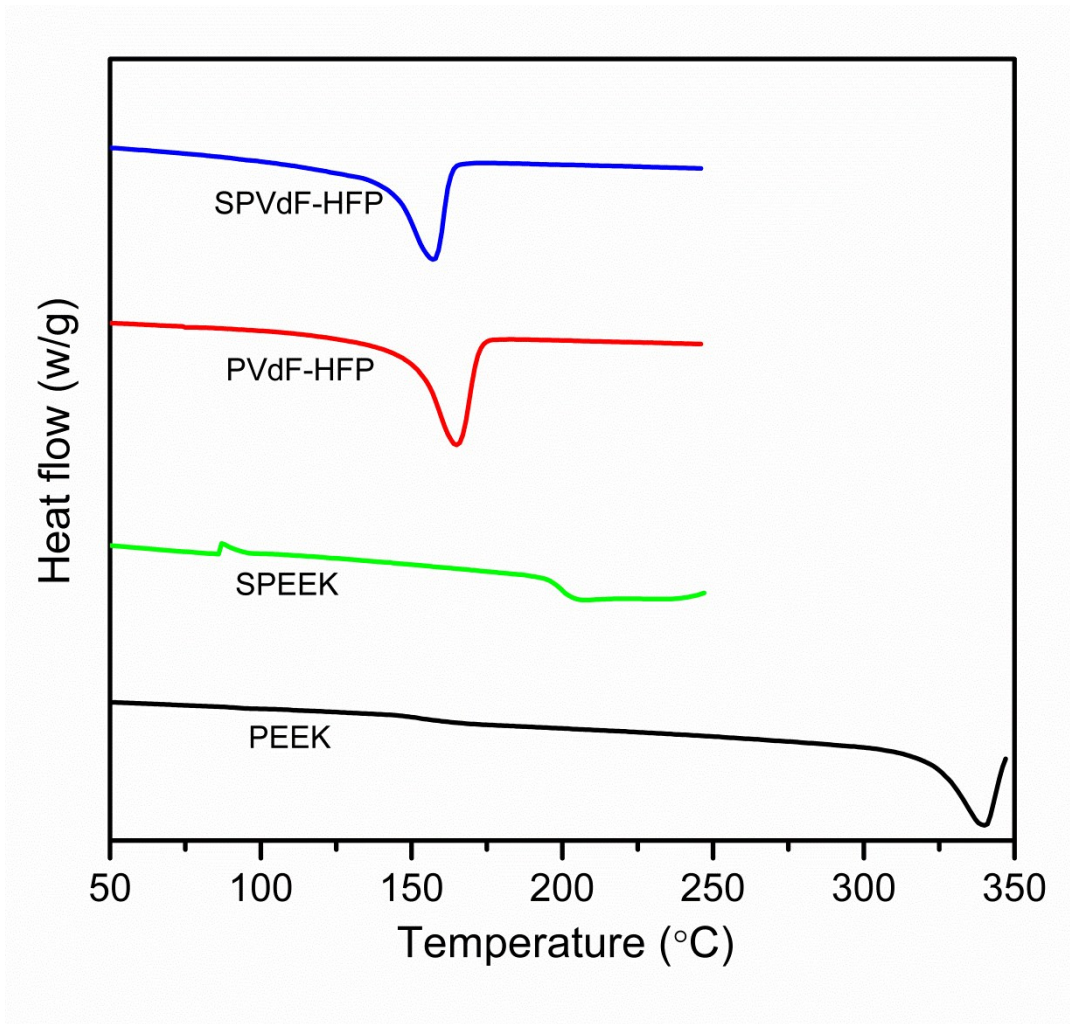


Fig. S6 DSC curves of PEEK, SPEEK, PVdF-HFP, and SPVdF-HFP.