

Supporting Information

Synthesis and Characterization of Highly Fluorinated Cross-linked Aromatic Polyethers for Polymer Electrolytes

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Molar Volume per Charge (MVC). Dried molar volume per charge (MVC) was calculated from van der Waals volume increments of composing atoms or structural groups^{1,2}:

$$\text{MVC}_{(\text{wet})} = \sum_i n_i V_i$$

Table S1. MVC of ESF-BPs, ESF-6Fs, and ESF-6Hs.

sample	MVC	sample	MVC	sample	MVC
ESF95-BP	299	ESF95-6F	303	ESF95-6H	301
ESF90-BP	317	ESF90-6F	325	ESF90-6H	322
ESF85-BP	337	ESF85-6F	350	ESF85-6H	346
ESF80-BP	360	ESF80-6F	378	ESF80-6H	372
ESF70-BP	414	ESF70-6F	446	ESF70-6H	435

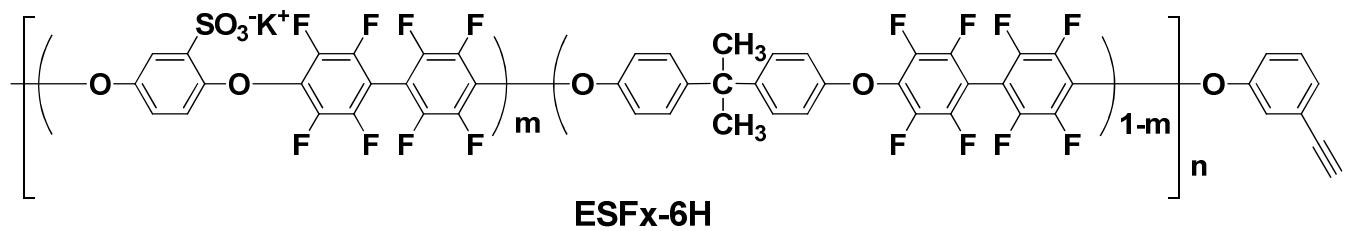


Figure S1. 6HBPA monomer based polymer structure (ESFx-6H).

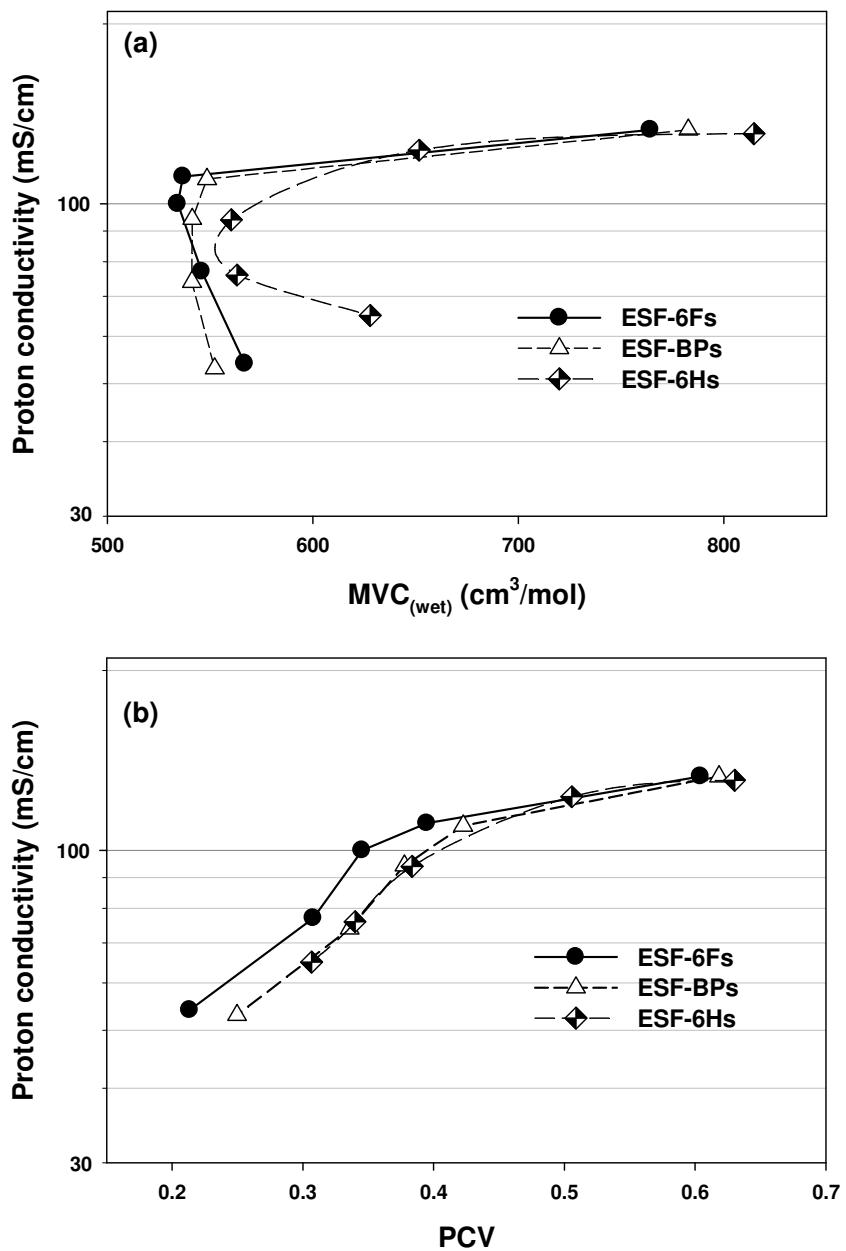


Figure S2. Proton conductivity as a function of $MVC_{(wet)}$ (a) and PCV (b) of ESF-6Fs, ESF-BPs, and ESF-6Hs under fully hydrated conditions at ambient temperature.

References

1. Kim, Y. S.; Pivovar, B. S. *Annu. Rev. Chem. Biomol. Eng.* **2010**, *1*, 123.
2. Van Krevelen, D.W. *Properties of Polymers: Their Correlation with Chemical Structure; Their Numerical Estimation and Prediction from Additive Group Contributions*, 3rd ed.; Elsevier: New York, USA, 1990; p 87.