Supporting Information

for

Ion Conduction in Polyethylene Oxide Ionically-Assembled Complexes

*Lu Zhang[1], Brian L. Chaloux[2], Tomonori Saito[2], Michael A. Hickner[2], Jodie L. Lutkenhaus[1]**

[1]Artie McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX 77843

[2]Department of Materials Science and Engineering, The Pennsylvania State University, University Park, PA 16802

Table S1. Glass transition temperatures of various PEO-ionomers examined

PEO Ionomer	T_g (K)
100% aminated polyurethane (Figure 1a)	250
50% aminated polyurethane (Figure 1a)	248
50% sulfonated polyacrylate (Figure 1b)	236
66% sulfonated polyacrylate (Figure 1b)	240

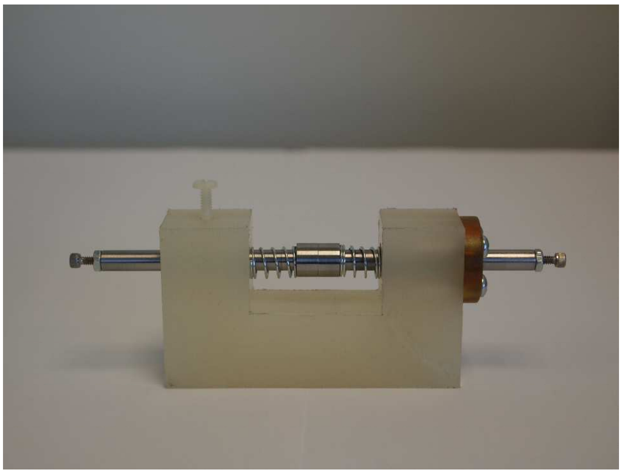

Figure S1. The device used for ionic conductivity measurement.

Equivalent circuit modeling

ZView™ software was used to analyze all complex impedance measurement to obtain the through-plane resistance of the polyelectrolyte cell (R_p) using equivalent circuit modeling, as illustrated in supplementary Figure S2. Because the polyelectrolyte complex does not have an ideal capacitance, a constant phase element (CPE) was used in place of a capacitor. R_s and R_p represent the resistance of connecting wires and the resistance of polyelectrolyte complex, respectively. The ionic conductivity of the polyelectrolyte complex (σ in S/cm) was then determined according to the following equation:

$$\sigma = \frac{l}{R_p A}$$

where l is the thickness of the cell membrane, R_p is the measured through-plane resistance of the polyelectrolyte complex membrane and A is the cross-sectional area of the cell membrane.

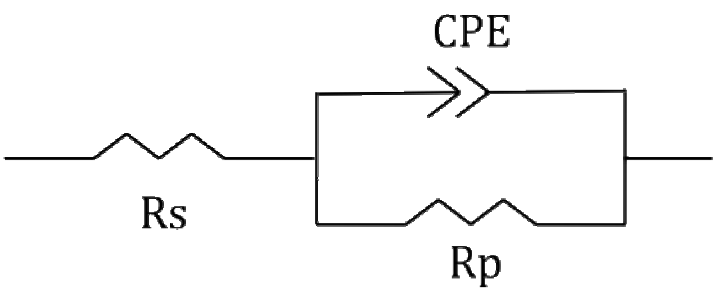

Figure S2. The equivalent circuit model used for the analysis of complex impedance measurement to get the through-plane resistance of the polyelectrolyte cell (R_p).