

## Electronic Supplementary Information

### UV-crosslinked Poly (arylene ether sulfone)-Laponite Nanocomposites for Proton Exchange Membranes

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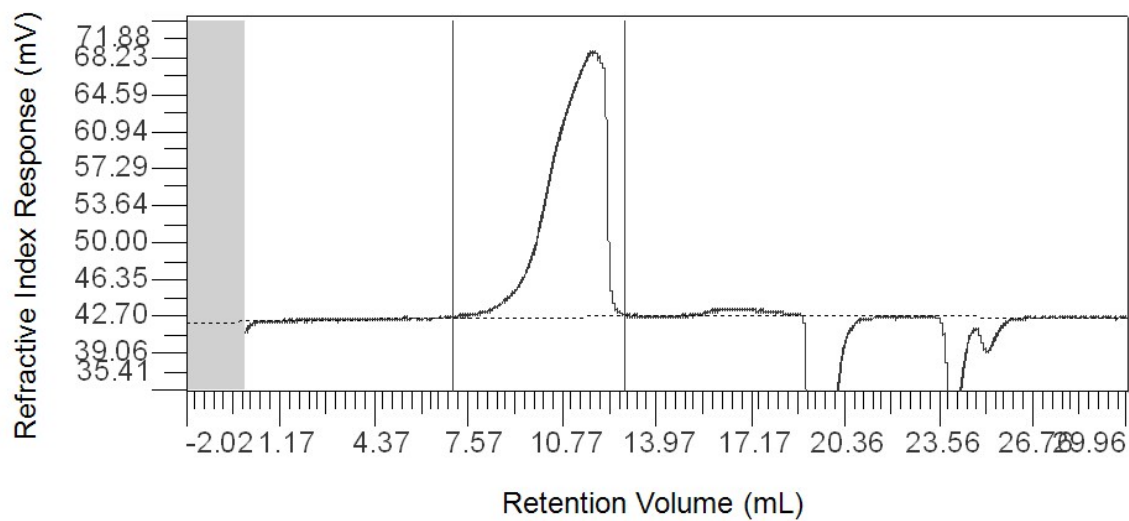


Fig. S1. Gel Permeation Chromatography (GPC) trace of as-synthesized sPAS. The Na-sDCDPS content in dihalides was 30 mol%. Number-Average Molecular Weight ( $M_n$ ) and Weight-Average Molecular Weight ( $M_w$ ) were 809,000 g/mol and 1,273,000 g/mol, respectively.

**Table. S1** Swelling behaviors of sPAs in MeOH. Membranes were immersed in 3M MeOH aqueous solution for 48 hours.

Na-sDCDPS / DABPA HDDA <sup>a</sup>	Dried samples			Degree of Swelling (%)				
	Thickness ( $\mu\text{m}$ )	TD (cm) <sup>b</sup>	MD (cm) <sup>c</sup>	Thickness	TD	MD	Area	Volume
30 / 25 / 0	28	1.2	1.55	111 %	107 %	106 %	114 %	126 %
30 / 25 / 5	28	1.2	2	104 %	108 %	106 %	115 %	119 %
30 / 25 / 10	40	1.24	1.9	105 %	103 %	106 %	109 %	115 %
30 / 25 / 15	15	1.2	1.9	107 %	113 %	105 %	118 %	126 %
20 / 25 / 0	60	1.5	2	102 %	101 %	104 %	106 %	108 %
20 / 25 / 10	104	1.5	2	101 %	105 %	104 %	109 %	110 %
20 / 25 / 15	64	1.5	2	102 %	103 %	104 %	107 %	108 %
20 / 25 / 25	71	1.5	2	104 %	104 %	105 %	110 %	114 %
Nafion 115	123	1.5	2	120 %	117 %	121%	141 %	169 %

<sup>a</sup>Na-sDCDPS / DABPA / HDDA mean the molar ratio (%) of specific reactants to total dihalides/diols/diallyl groups of loaded reactants. <sup>b</sup>TD denotes trajectory direction. <sup>c</sup>MD is machine direction.