

Electronic Supplementary Information (ESI)

Hydroxide conducting BAB triblock copolymers tailored for durable high-performance anion exchange membranes

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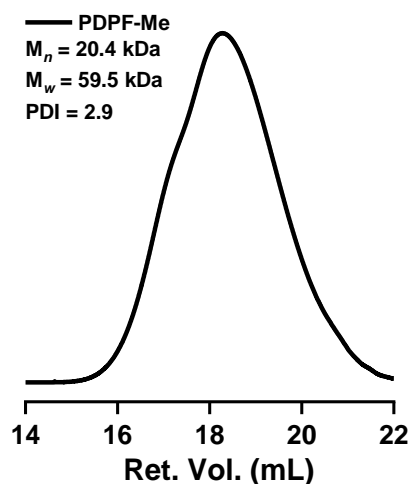


Fig. S1. SEC chromatogram of PDPF-Me with the M_n , M_w and PDI data.

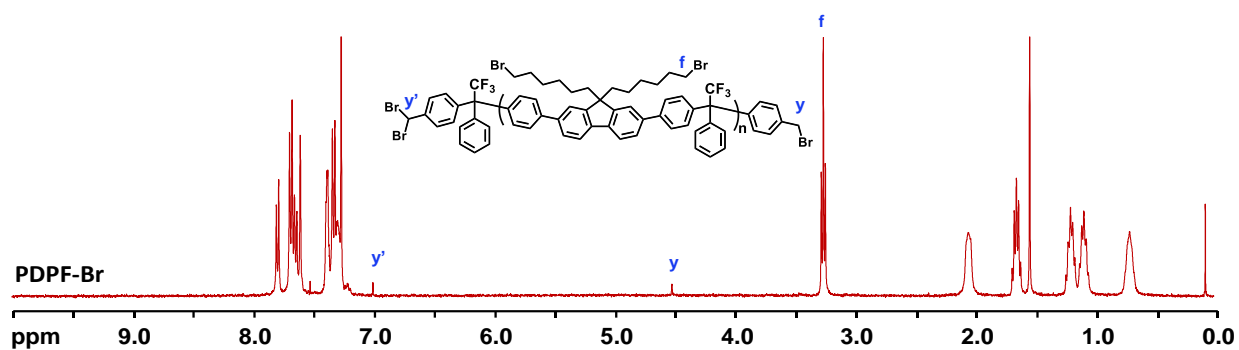


Fig. S2. ¹H NMR spectrum of PDPF-Br.

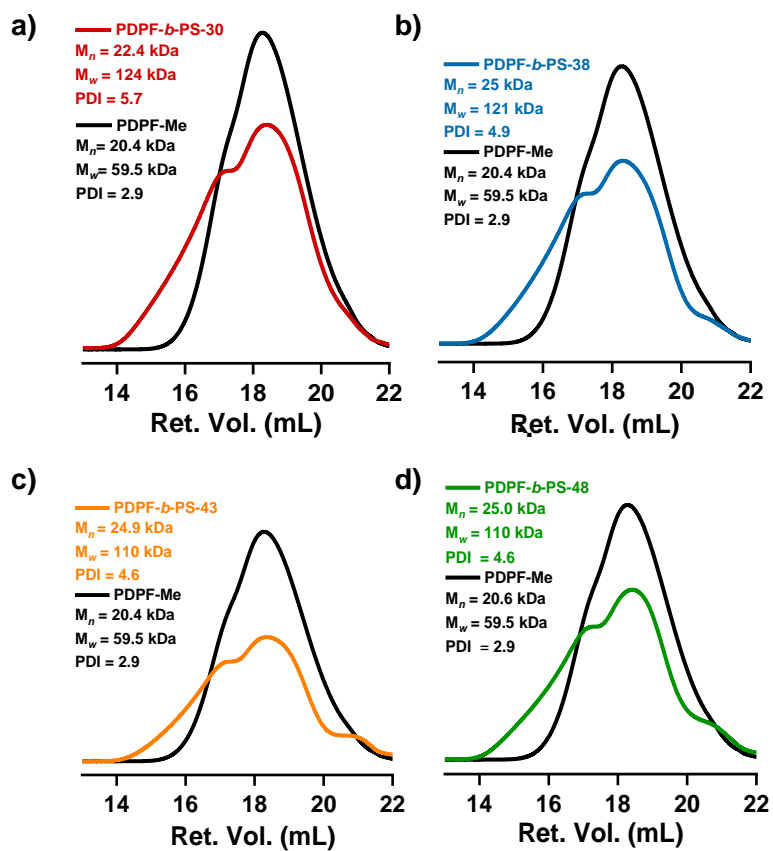


Fig. S3. SEC chromatograms of a) PDPF-*b*-PS-30, b) PDPF-*b*-PS-38, c) PDPF-*b*-PS-43, and d) PDPF-*b*-PS-48. Each panel includes the SEC trace of PDPF-Me for comparison, as well as the M_n , M_w and PDI data.

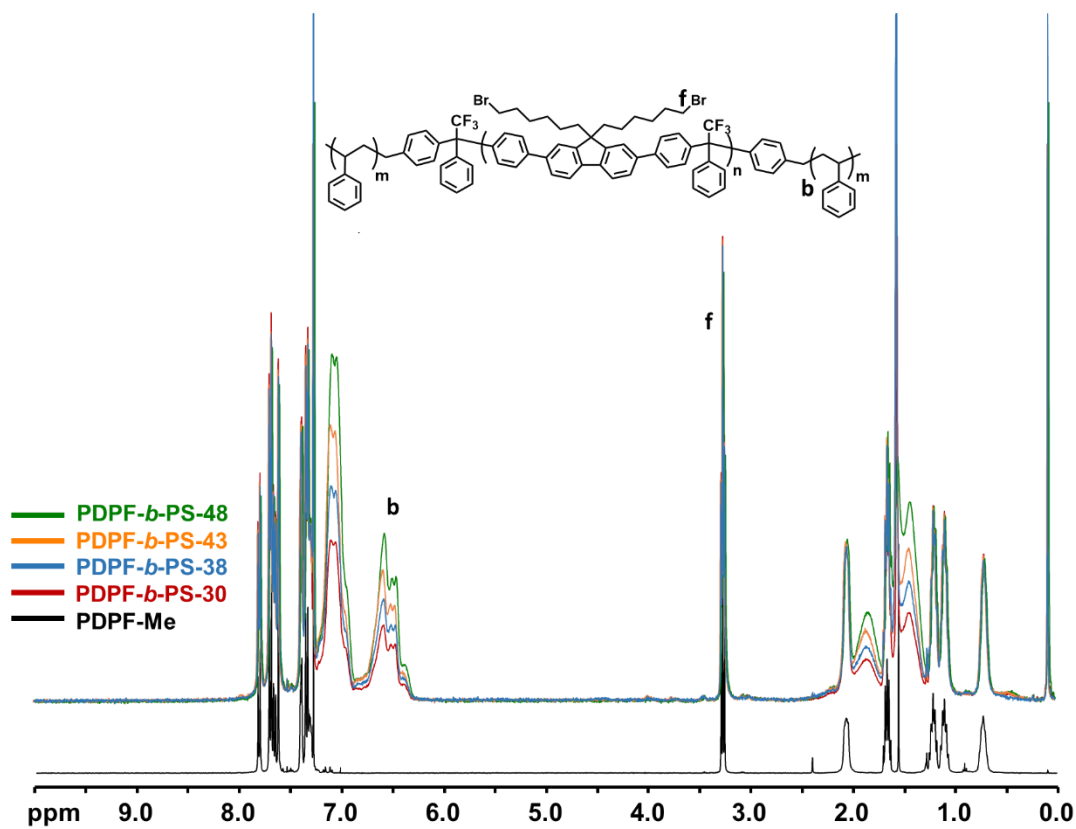


Fig. S4. The ^1H NMR spectra of a) PDPF-*b*-PS-30, b) PDPF-*b*-PS-38, c) PDPF-*b*-PS-43, and d) PDPF-*b*-PS-48.

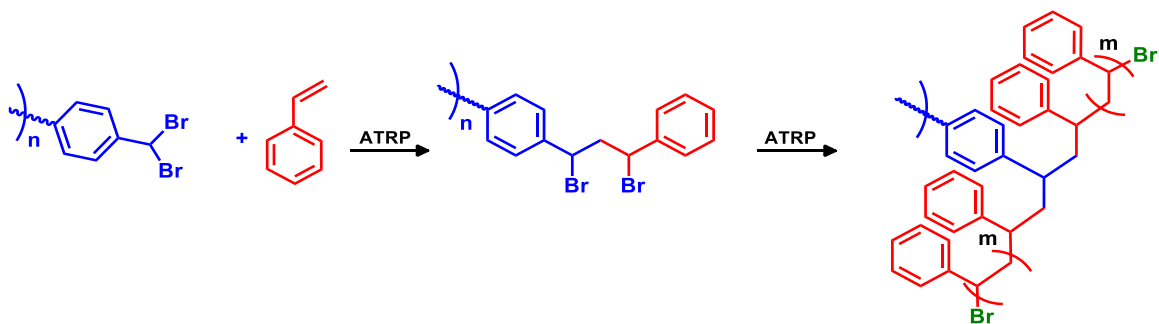


Fig. S5. The expected ATRP of styrene from of a dibrominated end group.

Table S1. Data from calculations of M_n values after assuming a random distribution of the double brominated sites.

Precursor polymers	PS content (wt%)	M_n of blocks of PS (kg mol^{-1})	M_n of block copolymer with single brominated side (kg mol^{-1})	M_n of block copolymer with double brominated site at one end (kg mol^{-1})	M_n of block copolymer with double brominated at both ends (kg mol^{-1})
PDPF-Me	0	0	25.4	25.4	25.4
PDPF-b-PS-30	38	3.18	31.8	34.9	38.1
PDPF-b-PS-38	38	4.02	33.4	37.5	41.5
PDPF-b-PS-43	43	4.55	34.5	39.1	43.6
PDPF-b-PS-48	48	5.08	35.6	40.6	45.7

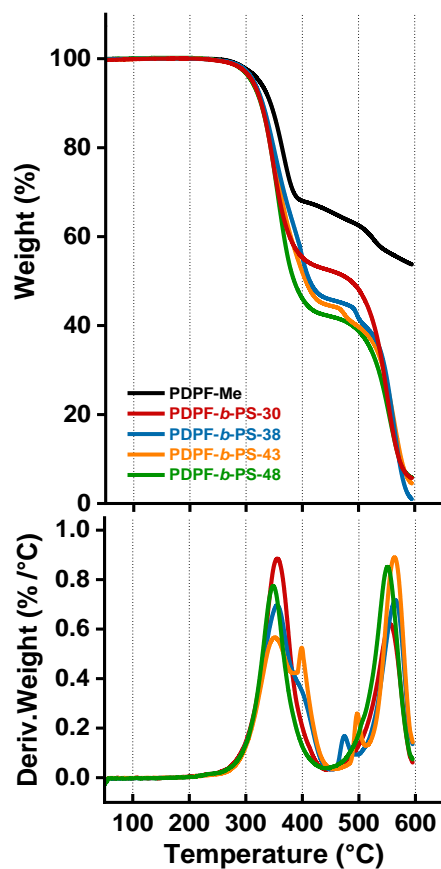


Fig. S6. TGA traces of the precursor BAB triblock copolymers in the PDPF-*b*-PS-*x* series (upper), and the corresponding first derivatives (lower).

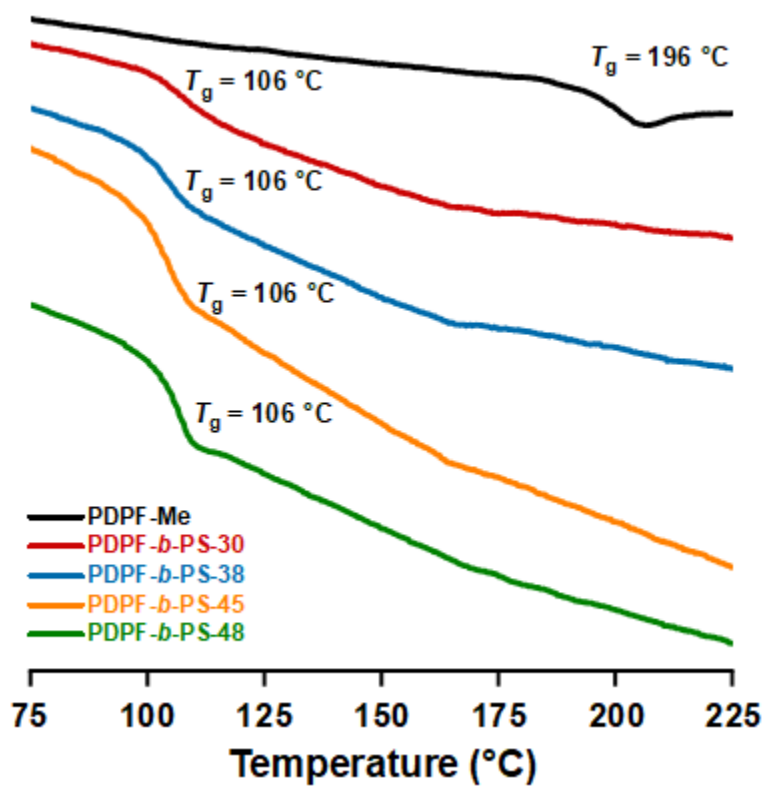


Fig. S7. DSC thermograms and T_g values of precursor copolymer PDPF-Me and the precursor BAB triblock copolymers in the PDPF-*b*-PS-*x* series.

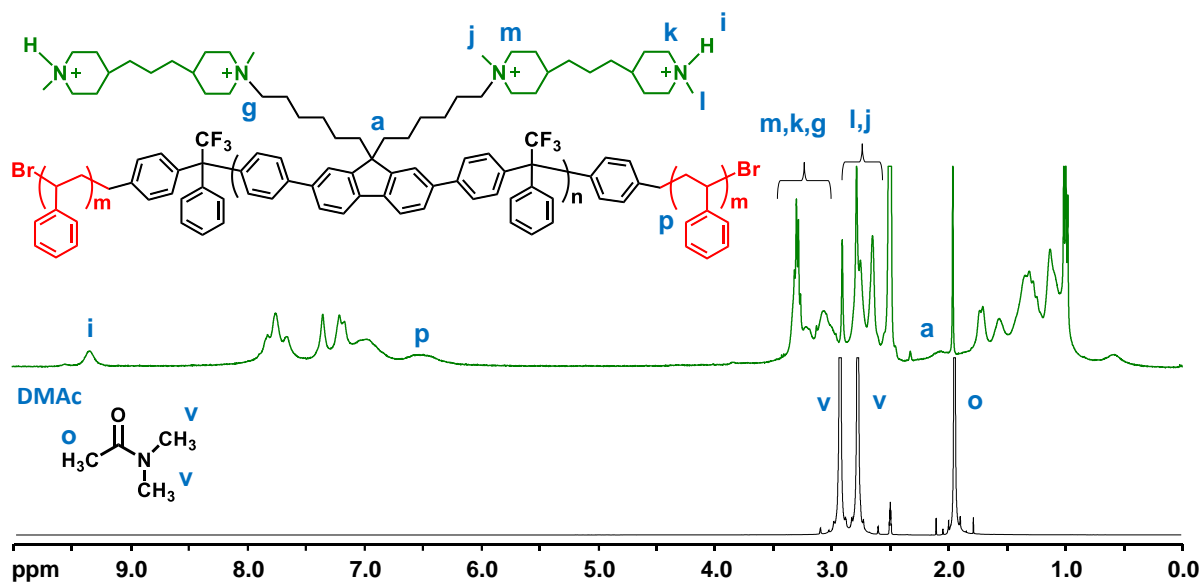


Fig. S8. Representative ^1H NMR spectra of PDPF-*b*-PS-bisPip-int (top) and DMAC solvent (bottom).

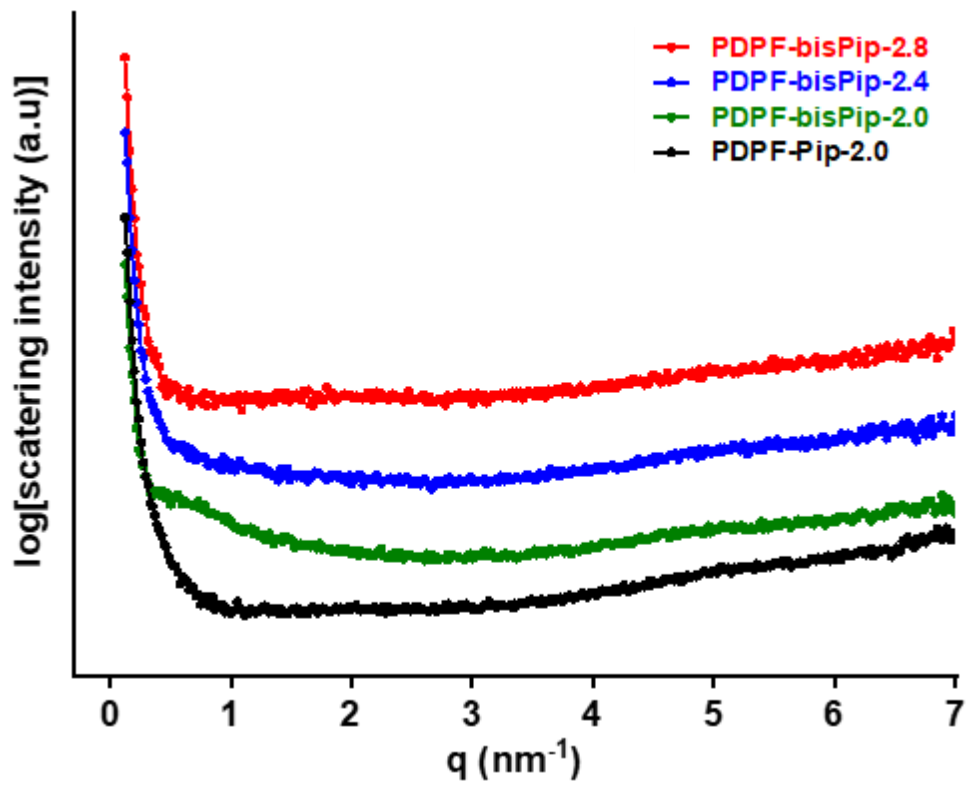


Fig. S9. SAXS profiles of the statistical block copolymer membranes functionalized with double pairs of piperidinium cations.¹

References

1. A. Allushi, T. H. Pham and P. Jannasch, *Journal of Membrane Science*, 2021, **632**, 119376.