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Supplementary Information

Facile construction of crosslinked all-carbon backbone anion exchange membranes with robust durability

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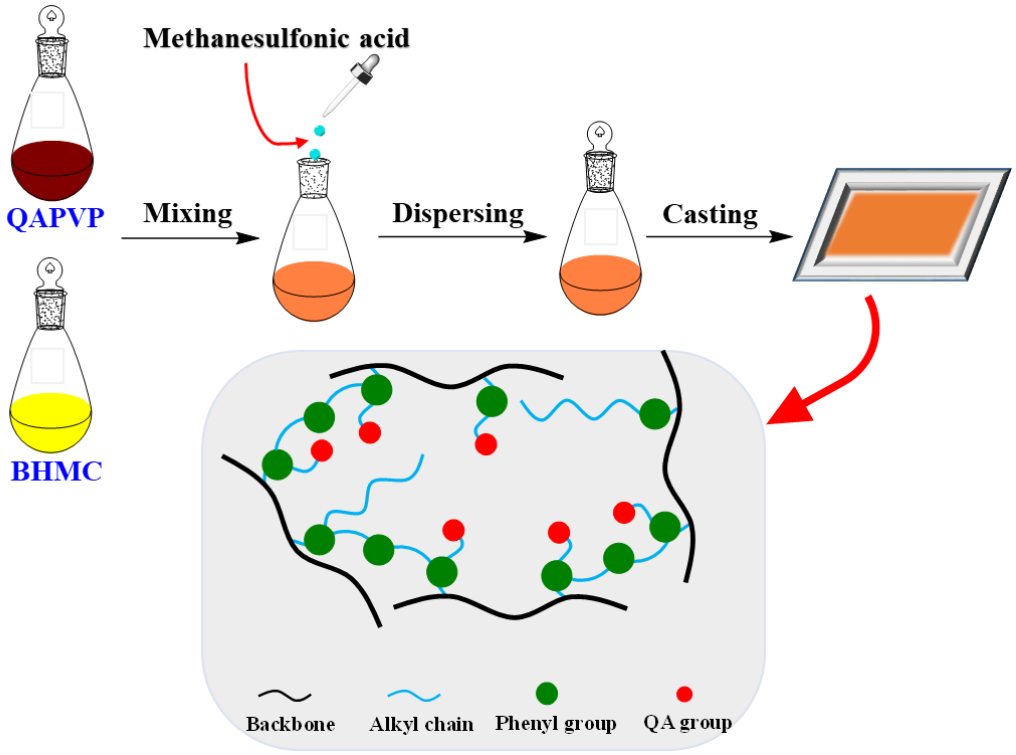


Scheme S1 Preparation of the QAPVP-x membranes

Table S1

The crosslinking condition for preparing the QAPVP-x membranes

Membrane	Amount of QAPVP (5 wt%)	Amount of BHMC (5 wt%)
QAPVP-5%	4 mL	0.1 mL
QAPVP-15%	4 mL	0.3 mL
QAPVP-35%	4 mL	0.7 mL

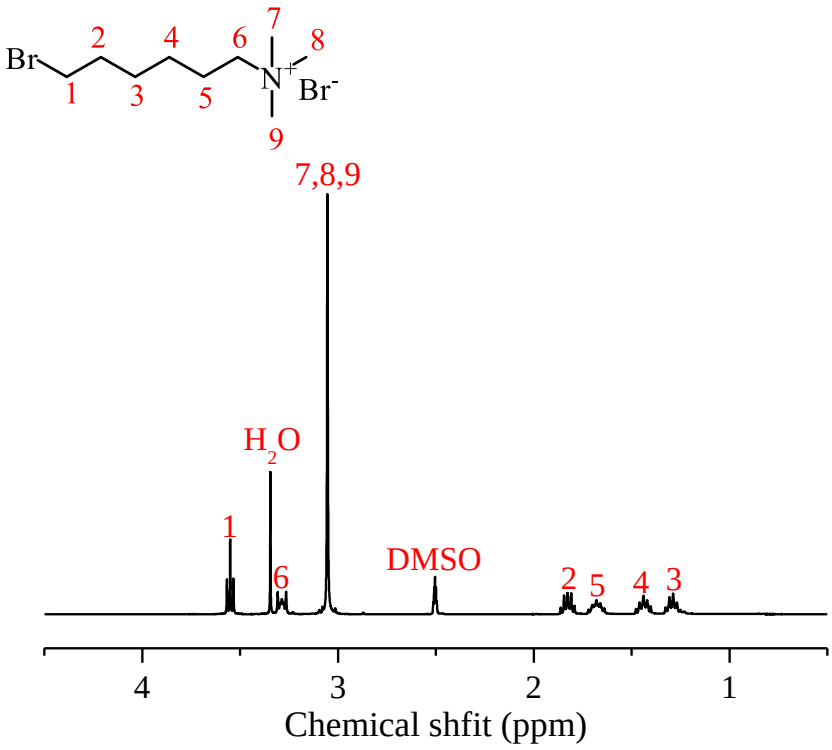


Fig. S1 ^{1}H NMR spectrum of the Br-QA groups

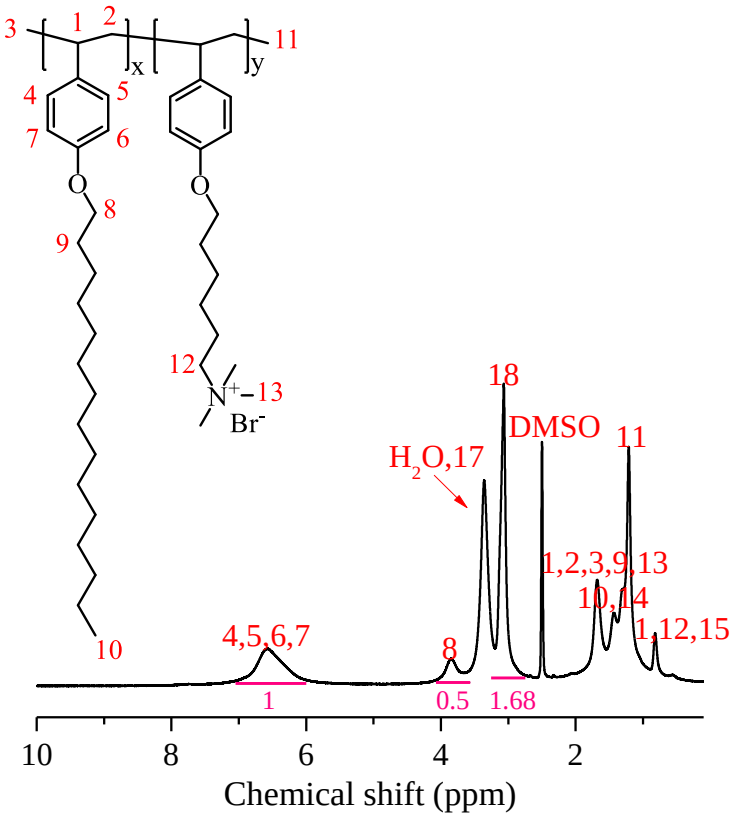
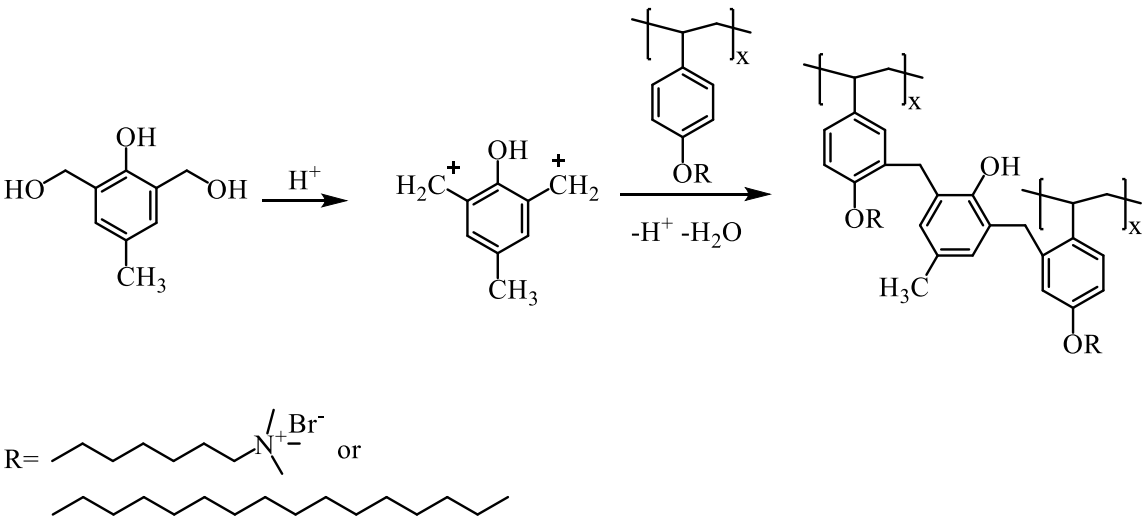


Fig. S2 ^{1}H NMR spectrum of the QAPVP



Scheme S2 The electrophilic aromatic substitution reaction between QAPVP and BMHC

Fig. S3 Photograph of the crosslinking of QAPVP and BHMC in a DMSO solution

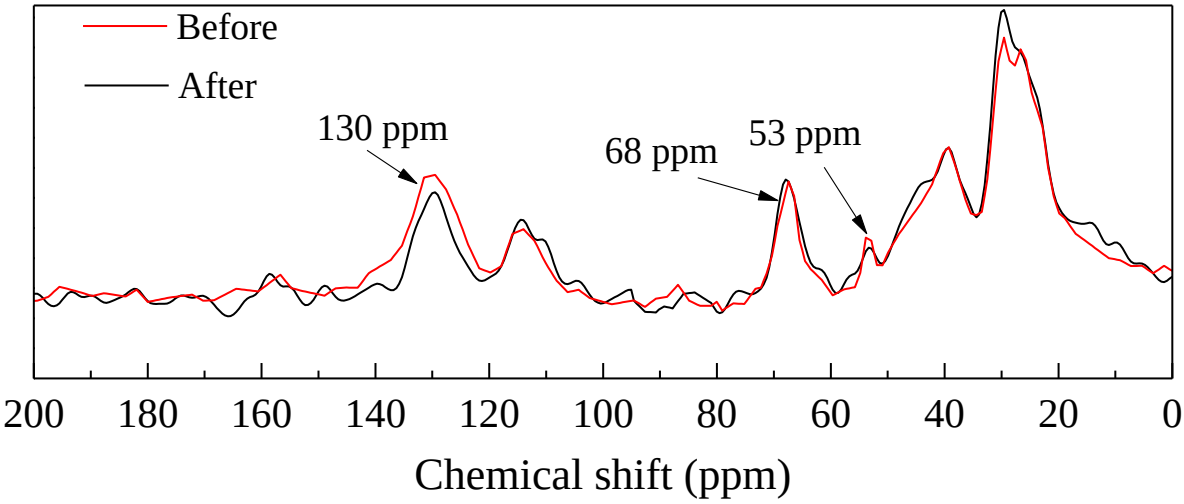


Fig. S4 ^{13}C NMR spectra of the QAPVP-5% membranes before and after the alkaline resistance test.

Table S1 A comparison of alkaline stability between the QAPVP-5% membrane and other side-chain-type membranes

Membrane	Testing solution	Testing temperature	Remaining conductivity
QAPVP-5%	2 M KOH	80 °C	91.3%
QPAEN-0.4[1]	2 M KOH	80 °C	80.0%
ABA-QA-3[2]	1 M KOH	80 °C	88.9%
50PPOC6N[3]	1 M NaOH	80 °C	82.4%
PES-6-QA[4]	1 M KOH	60 °C	85.0%
QCPPAE-4/1[5]	1 M NaOH	60 °C	80.0%
NC5Q-PPO-60[6]	1 M NaOH	60 °C	89.9%

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