

Supporting Information

**Semi-interpenetrating polymer networks by azide-alkyne cycloaddition as  
novel anion exchange membranes**

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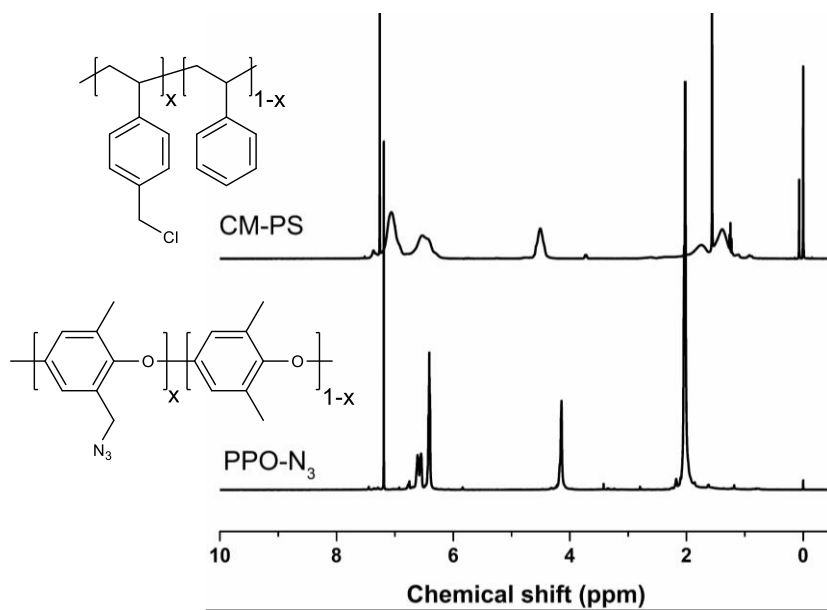
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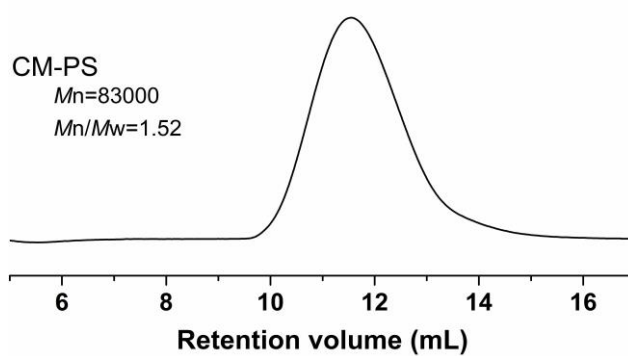
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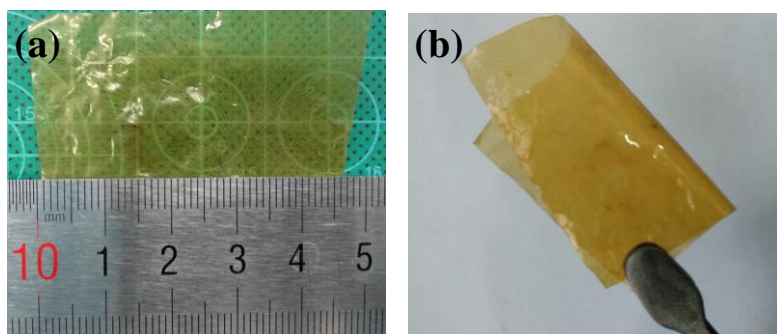
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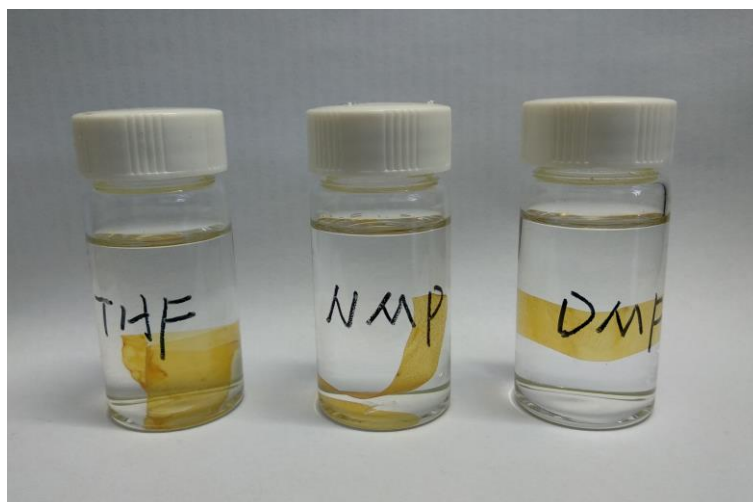
**Fig. S1**  $^1\text{H}$  NMR spectra of CM-PS copolymer and PPO- $\text{N}_3$ .



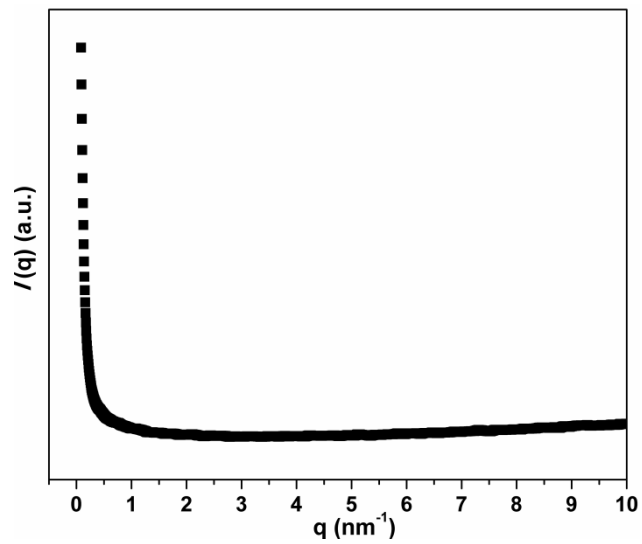
**Fig. S2** GPC curve (THF elution solvent) of CM-PS copolymer.



**Fig. S3** Digital photos of (a, b) semi-IPN membrane sIPN-62/30.



**Fig. S4** Solubility of sIPN-62/30 AEM in organic solvents (THF=tetrahydrofuran, NMP=N-methyl pyrrolidone, DMF=dimethyl formamide).



**Fig. S5** SAXS curve of sIPN-62/30 membrane

**Table S1** Properties of AEMs reported

Sample	Structure	Crosslinker	IEC <sup>a</sup>	WU <sup>b</sup>	$\sigma(\text{OH}^-)^c$	$\sigma'(\text{OH}^-)^d$	Ref.
PI-ran-P[VBTMA][Cl] 2.29	crosslinking	EDDT <sup>e</sup>	1.48	115	7.1 (60 °C)	4.8	1
J20PPO	crosslinking	Jeffamine <sup>f</sup>	1.58	121	23 (20 °C)	14.6	2
c-AEM-31	crosslinking	PPO-N <sub>3</sub>	1.95	19.7	14.8 (RT)	7.6	3
IPN64	IPN	TMEDA/GA <sup>g</sup>	1.13	42.6	8.65 (25 °C)	7.7	4
SIPN-60-2	semi-IPN	dithiol <sup>h</sup>	1.43	96.5	29 (RT)	20.3	5
PP-50	IPN	PVBC+PVIm/GA <sup>i</sup>	1.86	39.4	21.9 (30 °C)	11.8	6
QA sIPN-70/30	semi-IPN	DVB	2.15	76.0	50 (25 °C)	23.3	7
sIPN-62/30	semi-IPN	diyne	1.44	68.8	37.2 (RT)	25.8	this work

<sup>a</sup> Experimental IEC values by titration, meq/g. <sup>b</sup> Measured at 20 °C in water, wt %. <sup>c</sup> Measured in water, mS/cm. The values in brackets indicate the temperature of conductivity tested. <sup>d</sup> IEC-normalized hydroxide conductivity, mS·g/(cm·meq). <sup>e</sup> 2,2'-(ethylenedioxy)diethanethiol. <sup>f</sup> O,O'-bis(2-aminopropyl) polypropylene glycol-block-poly(ethylene glycol)-block-polypropylene glycol 500. <sup>g</sup> N,N,N',N'-tetra-methylethylenediamine (TMEDA) and glutaraldehyde (GA, 25 wt% content in water). <sup>h</sup> 1,6-hexanedithiol. <sup>i</sup> Poly(1-vinylimidazole) (PVIm).

## References

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