

Supporting information

**A novel approach to chiral separation: thermal-sensitive
hydrogel membranes**

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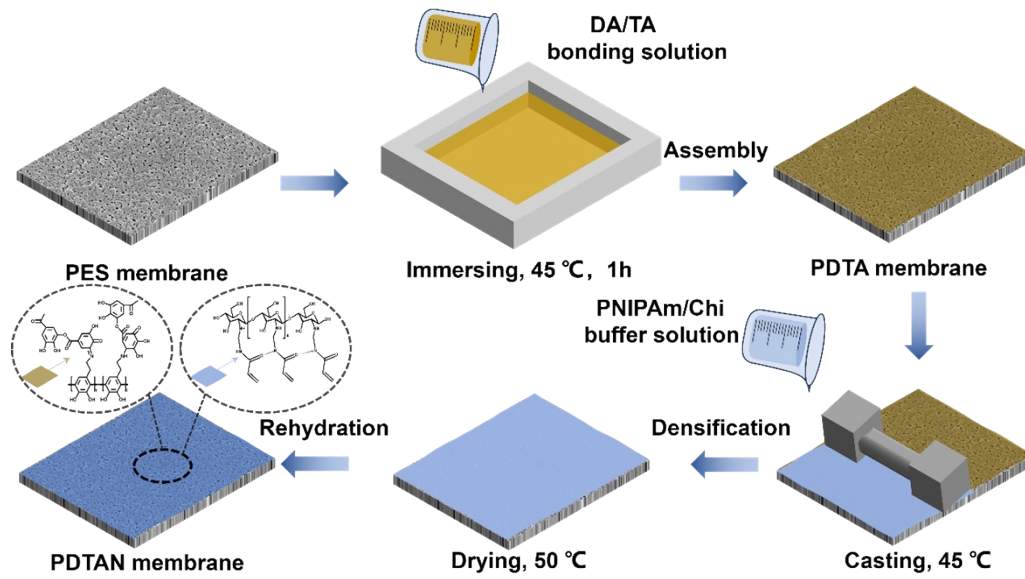


Fig. S1 Schematic diagram of temperature-sensitive hydrogel modified membrane (PDTAN) prepared by interfacial coating method.

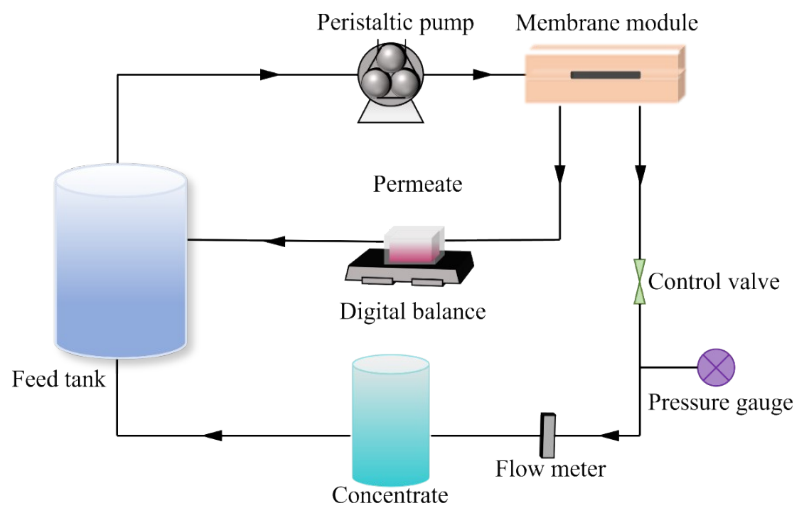


Fig. S2 Schematic diagram of the membrane separation setup.

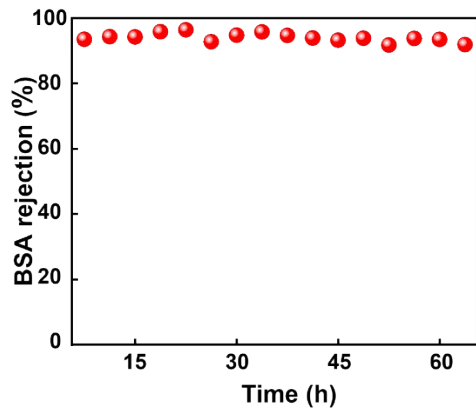


Fig. S3 BSA rejection by PDTAN membrane.

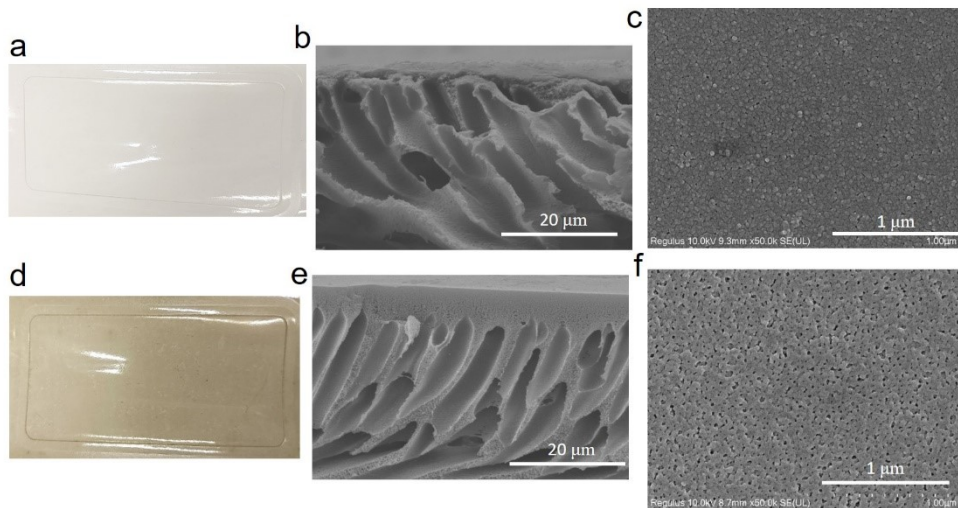


Fig. S4. Photo image (a, d), exterior (b, e), and sectional (c, f) view of SEM images of PES and PDTAN, respectively.

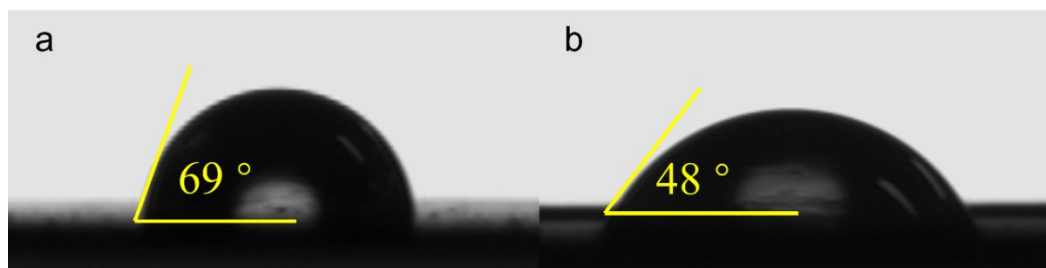


Fig. S5 Contact angles of PES membrane (a) and PDTAN membrane (b) at 20 °C.

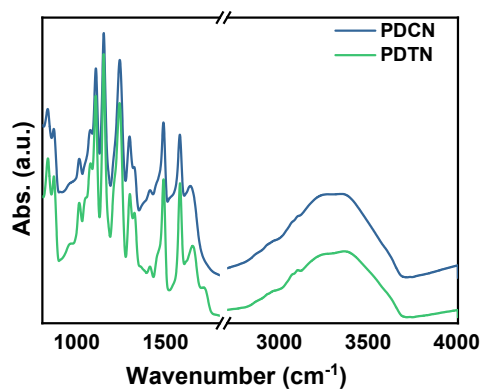


Fig. S6 FTIR spectra of PDTN and PDCN.

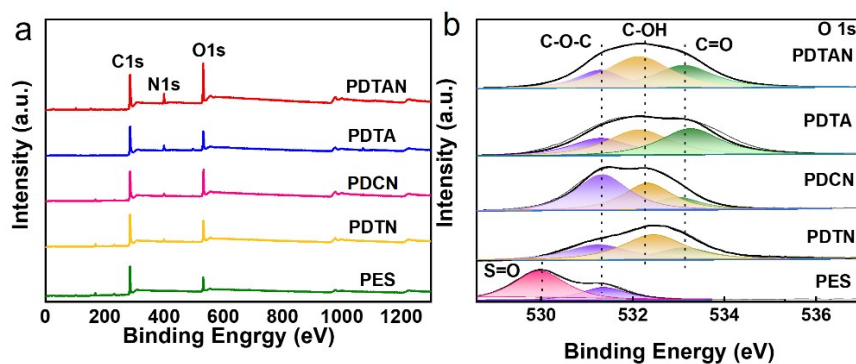


Fig. S7 XPS spectra (a) and O 1s analysis (b) of PES, PDTN, PDCN, PDTA, and PDTAN membranes.

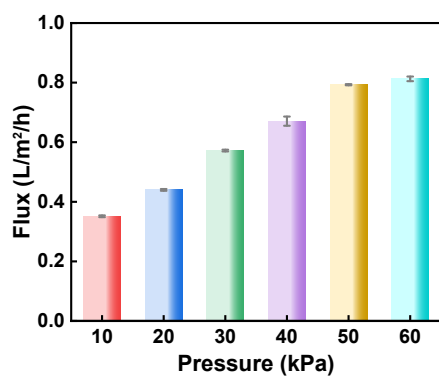


Fig. S8. Permeate flux of PDTAN membrane under different pressures.

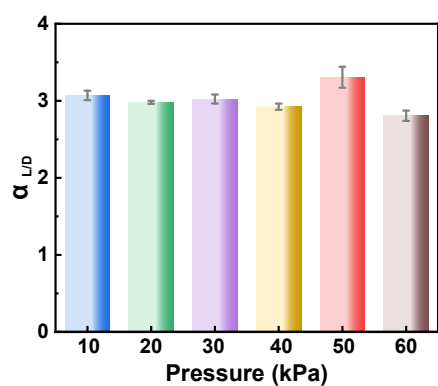


Fig. S9 The effects of pressure on the chiral separation efficiency of PDTAN membranes.

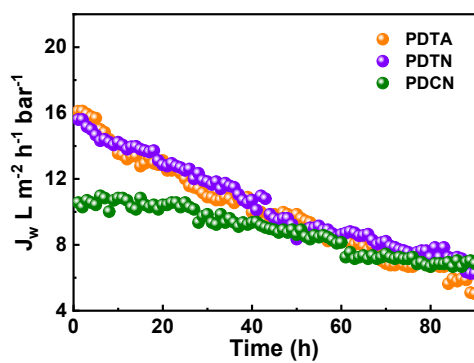


Fig. S10 J_w of PDTA, PDTN, and PDCN membranes.

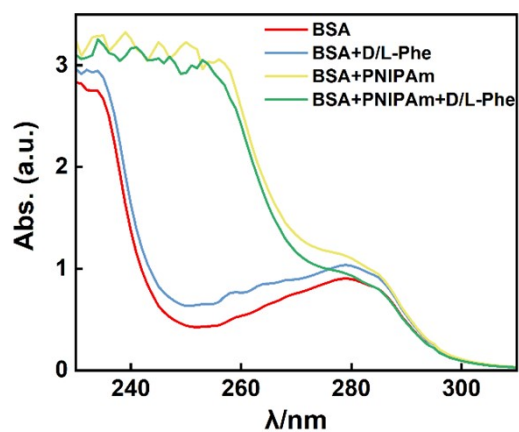


Fig. S11 UV-vis spectra of BSA structure in different conditions.

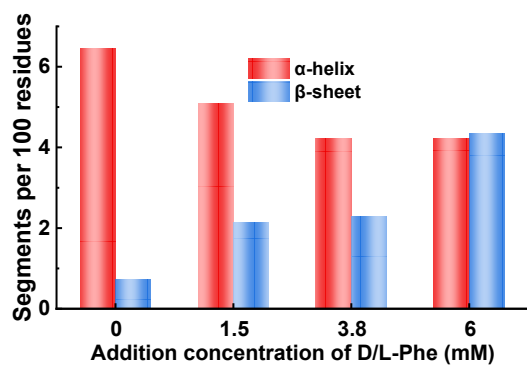


Fig. S12 Fitting analysis of α -helix and β -sheet segments per 100 residues in different concentrations of D,L-Phe.

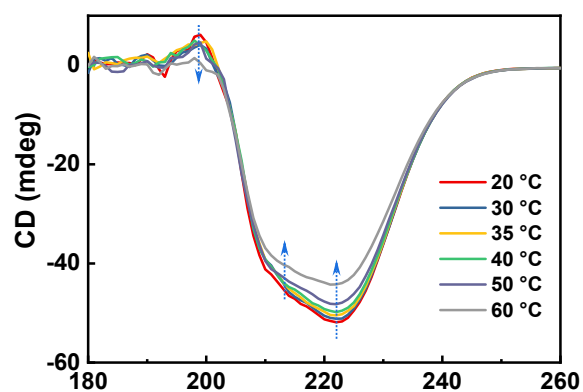


Fig. S13 CD spectra of BSA structure ranging from 20 °C to 50 °C on PNIPAm.

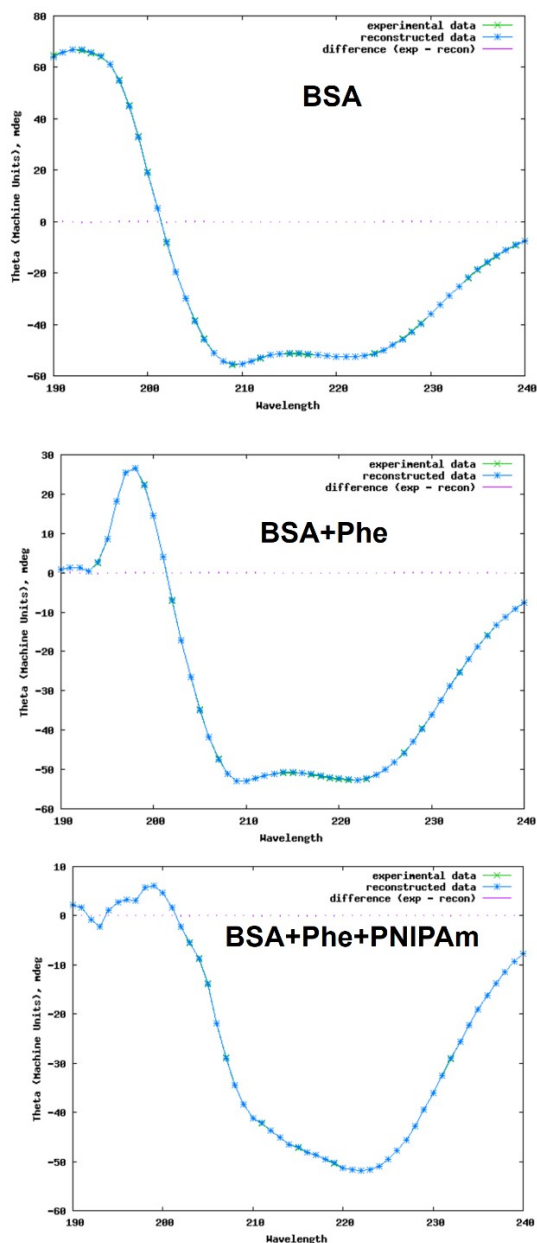


Fig. S14 The fitting analysis of α -helix and β -sheet segments per 100 residues by DichroWeb.

Table S1 Comparison of chiral separation performance in membrane-based system.

Membrane	Selectivity ratio	Experimental condition	Technique	Ref
PDTAN	$\alpha_{L/D} = 3.30 \pm 0.14$	P = 0.05 bar, T = 40 °C		Our work
Chiral membrane	$\alpha_{L/D} = 1.7$	P = 0.1 MPa, Flux = 75 kg/m ³ ·h	Separation	[1]
PES membrane	$\alpha_{D/L} = 2.2$	Feed pH = 9, P = 0.1 bar		[2]

molecularly imprinted membrane	L-Phe-MIM $\alpha_{L/D}$ =2.23 D-Phe-MIM $\alpha_{D/L}$ $\alpha_{L/D}$ =2.20	Flux = 794.75 mmol s ⁻¹ m ⁻²	Electrodialysis	[3]
Molecularly imprinted organic–inorganic hybrid membranes	$\alpha_{D/L}$ =1.8	Diffusion is carried out in the tank	Diffusion	[4]
composite imprinted membranes	DCM $\alpha_{D/L}$ =2.72 LCM $\alpha_{L/D}$ =2.98	P = 1 atm		[5]
L-Phe-MIPs ionic liquid	$\alpha_{L/D}$ = 1.44	The mixtures were oscillated at 35 rpm for 8 h at 25 °C, and then centrifuged at 8500 rpm for 10 min.	Adsorption	[6]

References

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