Supporting Information

Tuning *d*-spacing of graphene oxide nanofiltration membrane for effective dye/salt separation

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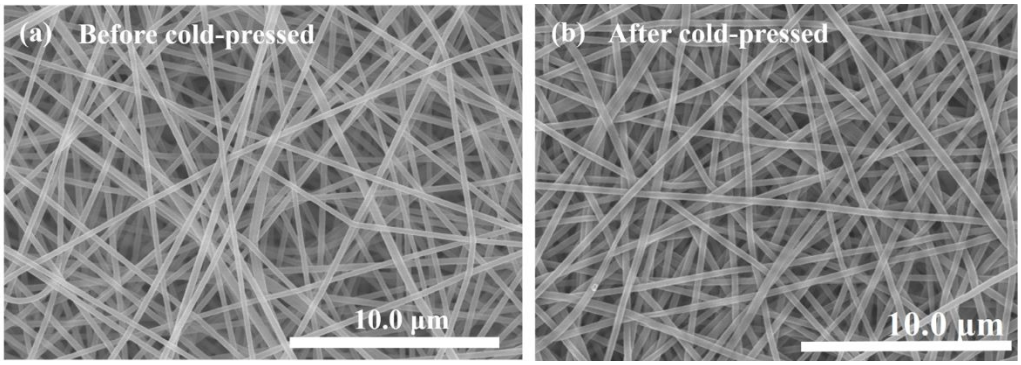


Figure S1. The typical SEM images of the PAN substrate before (a) and after (b) cold-pressed.

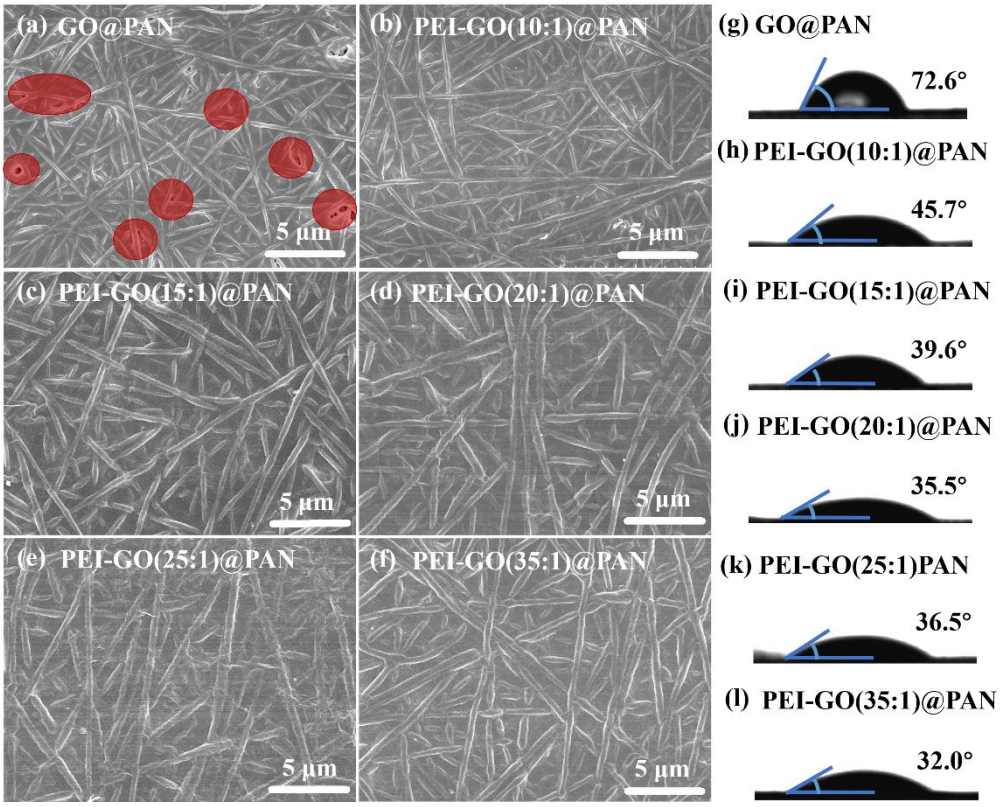


Figure S2. (a-f) Surface SEM images of GO@PAN membrane and PEI-GO@PAN membranes; (g-l) The water contact angles of GO@PAN membrane and PEI-GO@PAN membranes.

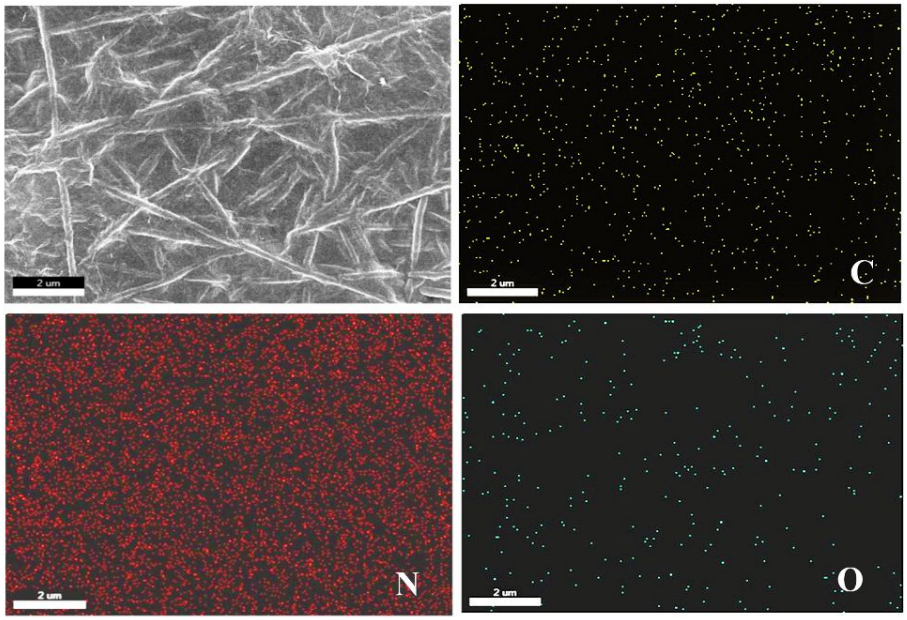


Figure S3. The EDS spectra of the PEI-GO(15:1)@PAN membrane.

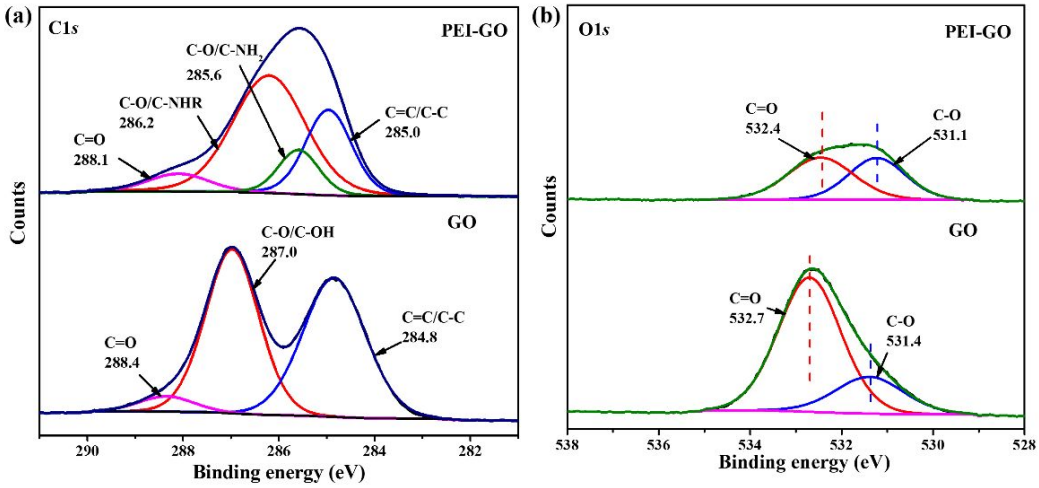


Figure S4. The XPS spectra of C=O in C 1s (a) and O 1s (b).

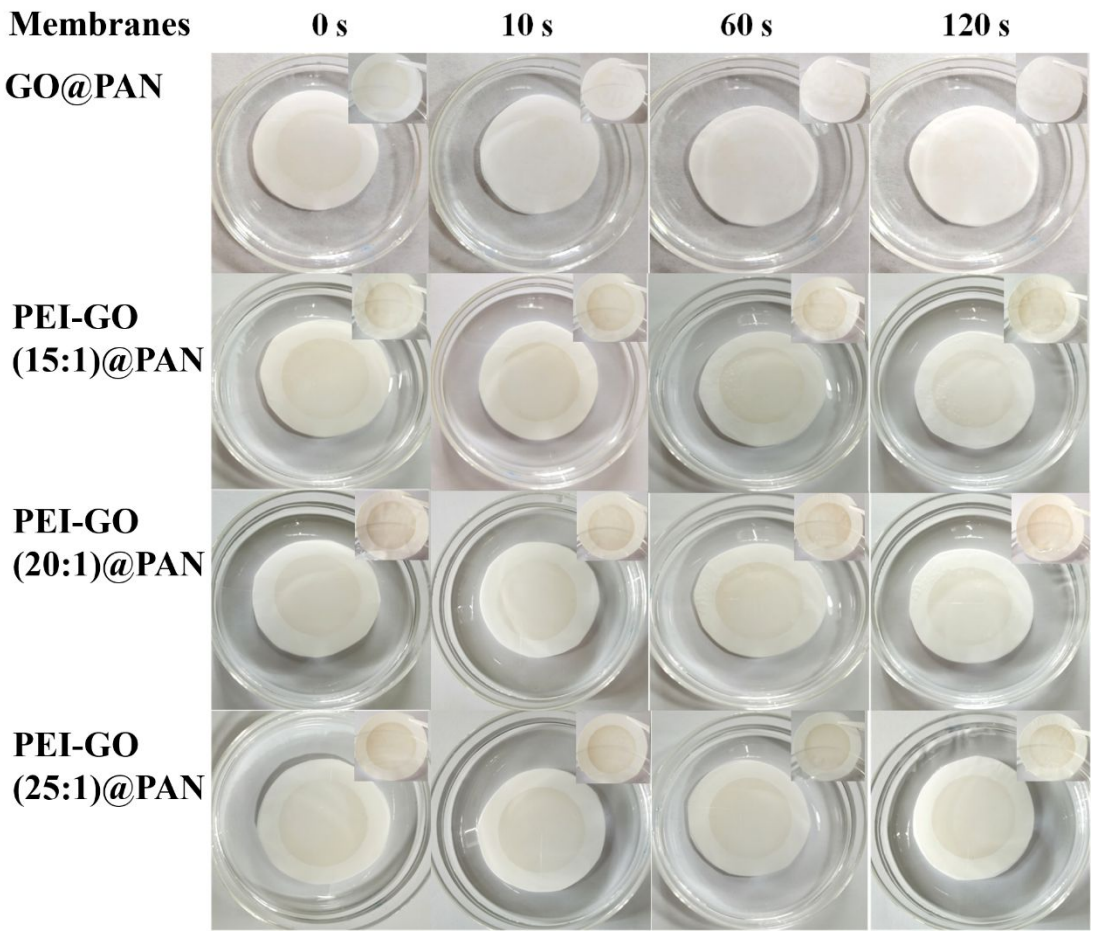


Figure S5. The ultrasound experiments result of GO@PAN membrane and PEI-GO@PAN membranes in water.

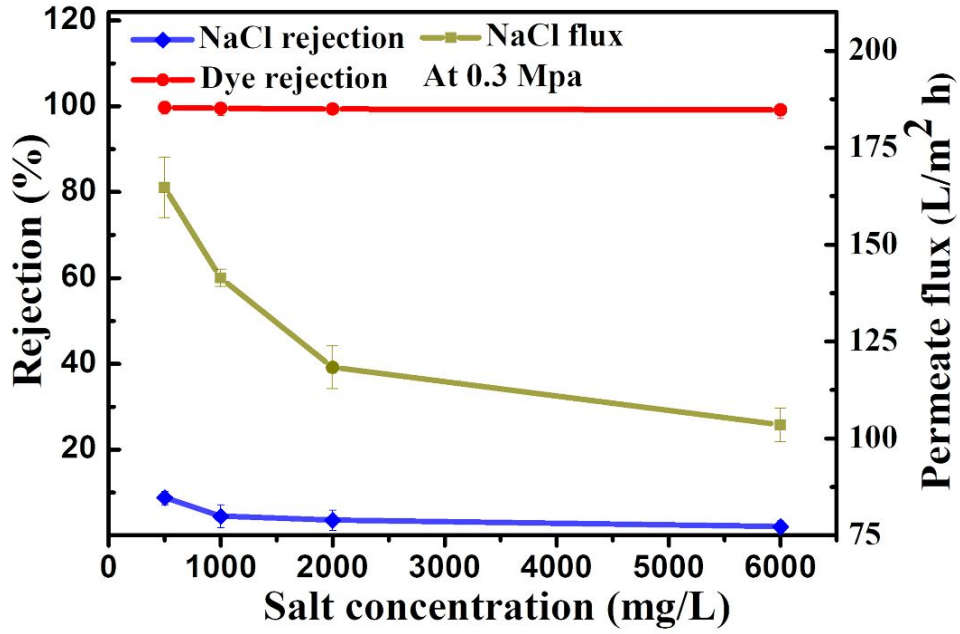


Figure S6. The dye/salt separation performance of the PEI-GO(15:1)@PAN membrane to NaCl solutions at various concentrations.

Figure S7. The photo of the 0.01 mg mL^{-1} GO solution

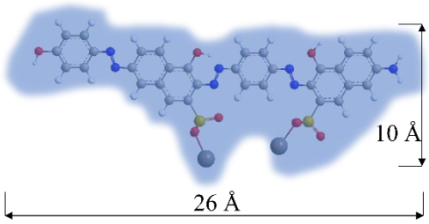
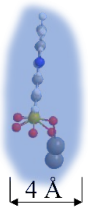
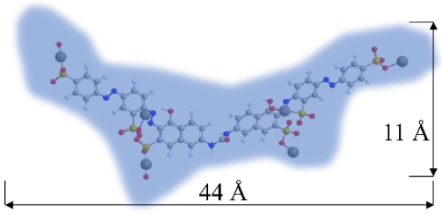
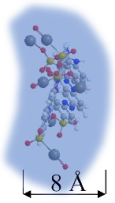
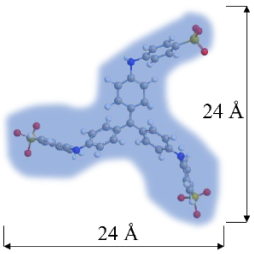
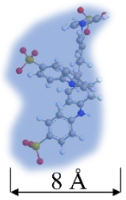
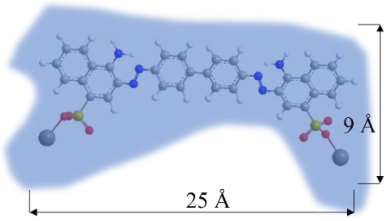
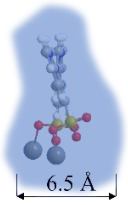
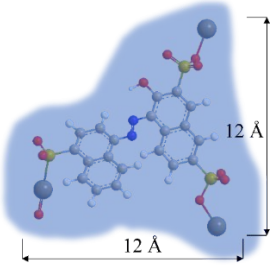
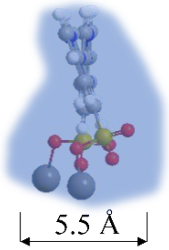
Table S1. The content of chemical elements changes of GO and PEI-GO(15:1) from XPS spectra.

Membrane	C1s At. %	O1s At. %	N1s At. %
GO	70.0	30.0	
PEI-GO	66.5	16.7	16.8

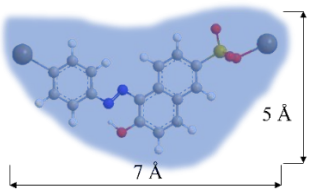
Table S2. The diameter of hydrated ions.[1]

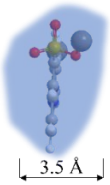
Name	Hydrated Diameter (Å)
Na^+	7.16
Cl^-	6.64
SO_4^{2-}	7.58

Table S3. The chemical structure and the front and side views of the ball-and-stick models of the hydrated dye molecules with maximum dimensions.[1, 2]

Dyes	Molecular Models (Front View)	Molecular Models (Side View)
Columbia Blue (CB)		
Direct Red (DR 80)		
Methyl Blue (MB)		
Congo Red (CR		
Amaranth (AM)		

Sunset Yellow (SY)





[1] Huang L., Huang S., Venna S. R. and Lin H., Rightsizing Nanochannels in reduced graphene oxide membranes by solvating for dye desalination, *Environmental science & technology*, 2018, **52**(21).
[2] Akbari A., Sheath P., Martin S. T., Shinde D. B., Shaibani M., Banerjee P. C., Tkacz R., Bhattacharyya D. and Majumder M., Large-area graphene-based nanofiltration membranes by shear alignment of discotic nematic liquid crystals of graphene oxide, *Nature communications*, 2016, **7**(1).