Supporting Information for

Ultrathin Polyamide Nanofiltration Membrane Fabricated on Brush-Painted Single-Walled Carbon Nanotube Network Support for Ion Sieving

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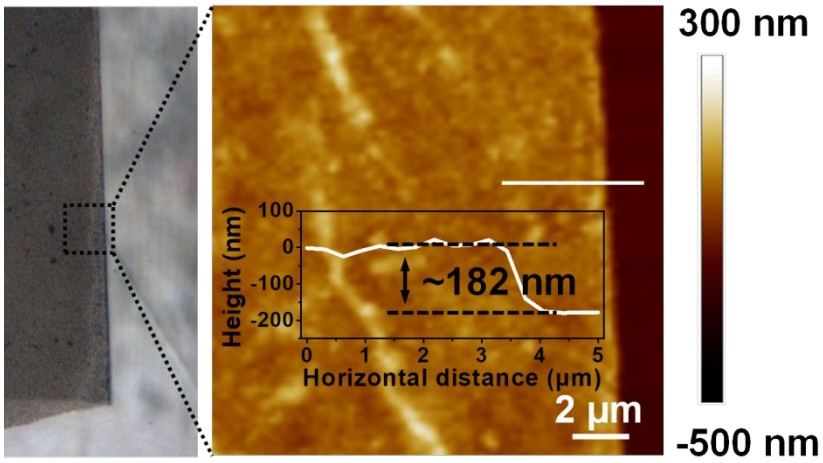

Figure S1. Digital photograph and atomic force microscopy (AFM) image of a folded SWCNT network membrane fabricated with 3 painting cycles on a mica sheet. Thickness of the folded SWCNT bilayer membrane is calculated to be ~182 nm according to the height information near the folded membrane edge. Hence, thickness of the SWCNT monolayer membrane is ~91 nm.

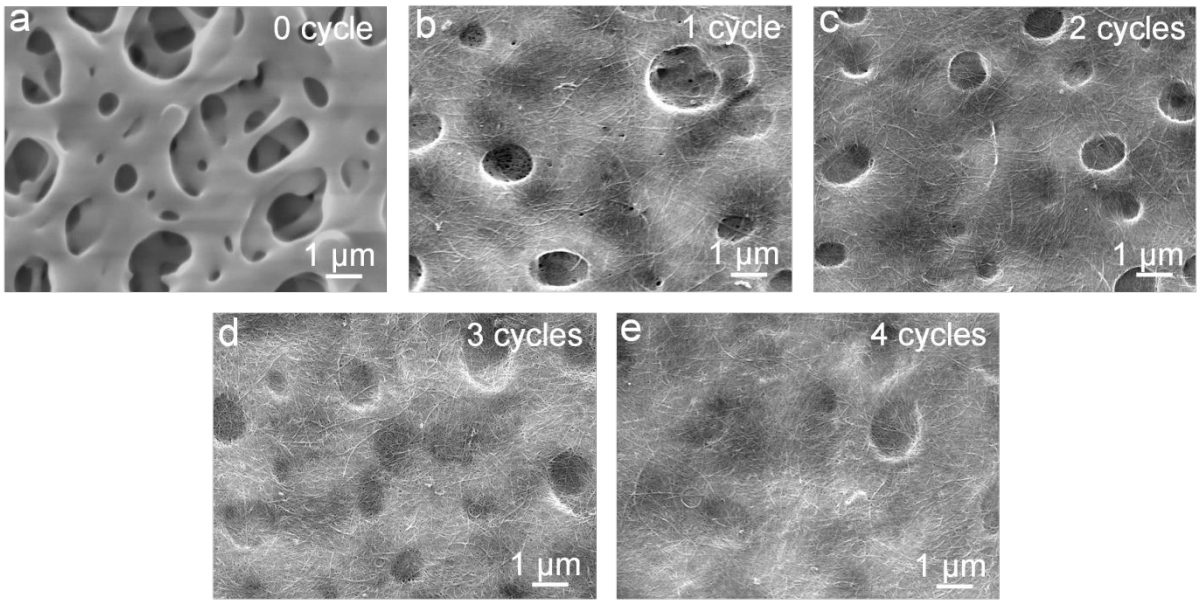

Figure S2. Scanning electron microscopy (SEM) images of polyethersulfone microfiltration (PES MF) membrane and SWCNT network membranes fabricated on the PES MF membrane with different painting cycles.

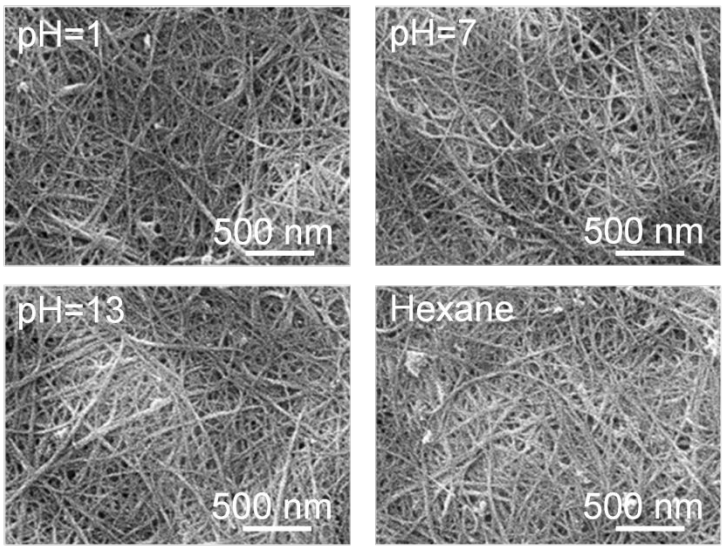

Figure S3. SEM images of the SWCNT network membrane after it was immersed in water with pH of 1, 7, 13 and in n-hexane for 30 consecutive days, respectively.

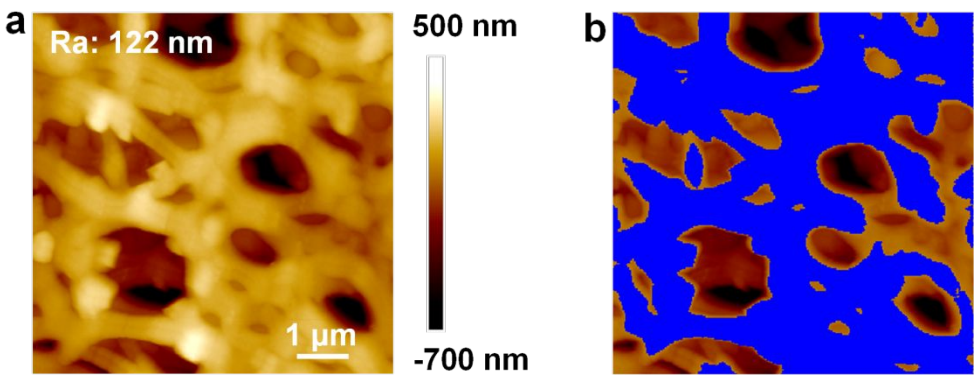

Figure S4. (a) AFM image of the PES MF membrane used in this work and (b) corresponding marked figure for surface roughness measurement. Surface roughness of the PES MF membrane was measured based on the blue area of the membrane surface (Figure S4b), where the pores are not counted. Surface roughness of the membrane is measured to be 122 nm.

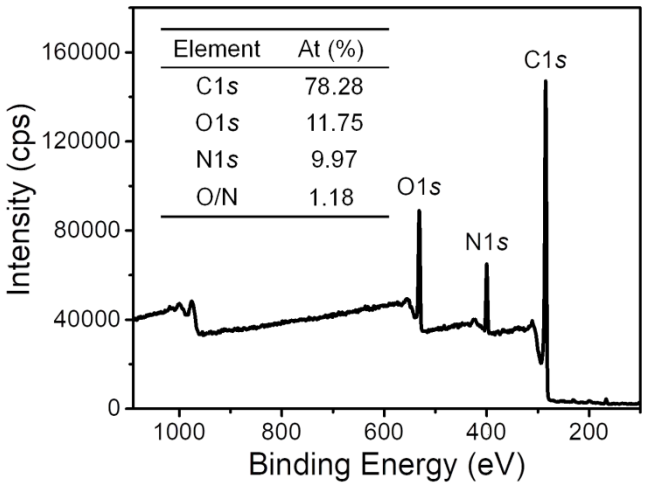

Figure S5. X-ray photoelectron spectroscopy survey spectrum of the polyamide membrane fabricated on SWCNT network support. Based on the characteristic peak

areas in consideration of the sensitivity factors, the calculated atom percentages of C, O, N is 78.28%, 11.75%, 9.97%, respectively. The O/N ratio is 1.18, and the crosslinking degree of the polyamide membrane is calculated to be 75.42%.

Figure S6. Photograph of the homemade U-shaped glass apparatus used for concentration gradient-driven ion diffusion experiment.

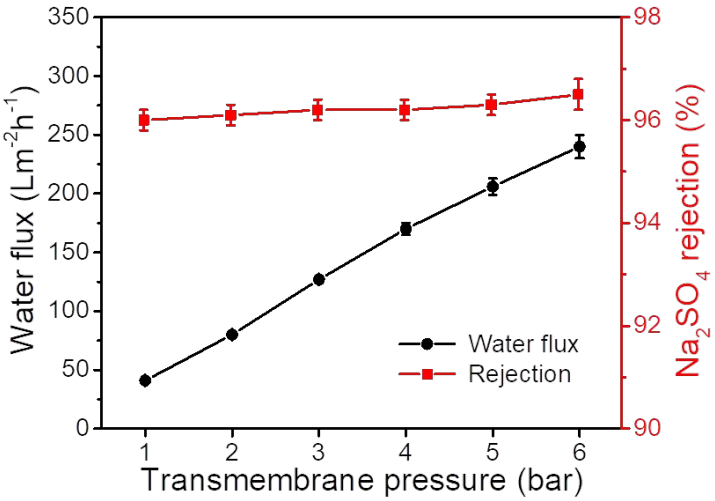

Figure S7. Water flux and Na_2SO_4 rejection of the polyamide membrane under different transmembrane pressures (Na_2SO_4 concentration: 1000 ppm).

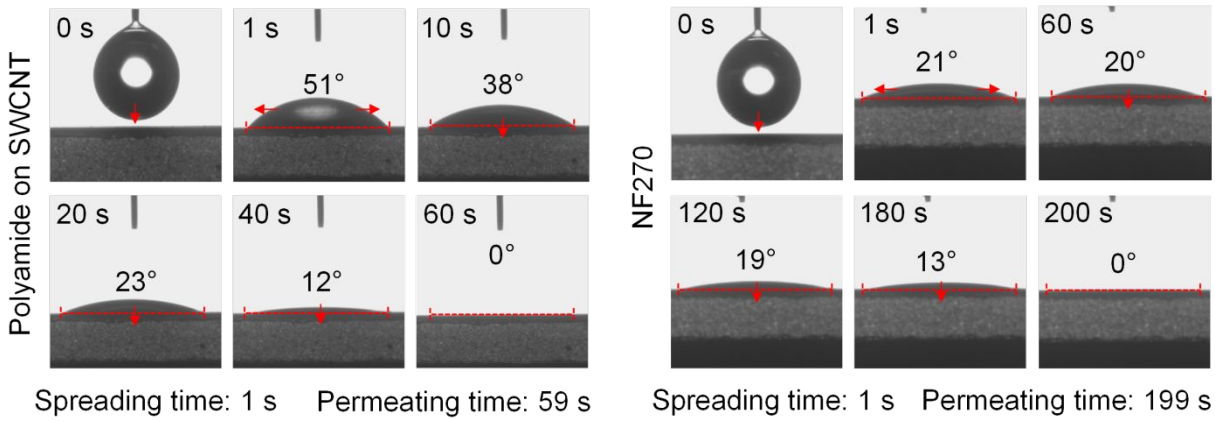

Figure S8. Optical images showing the dynamic spreading and permeating behaviors of a water droplet (3 μL) on (a) the polyamide membrane fabricated on SWCNT network support and (b) commercial NF270 membrane from The Dow Chemical Company. It takes 59 seconds for the water droplet to permeate through the polyamide membrane on SWCNT network support. While it is 199 seconds in the case of NF270. These results demonstrate the water permeating speed of our membrane is much faster than the NF270 membrane.

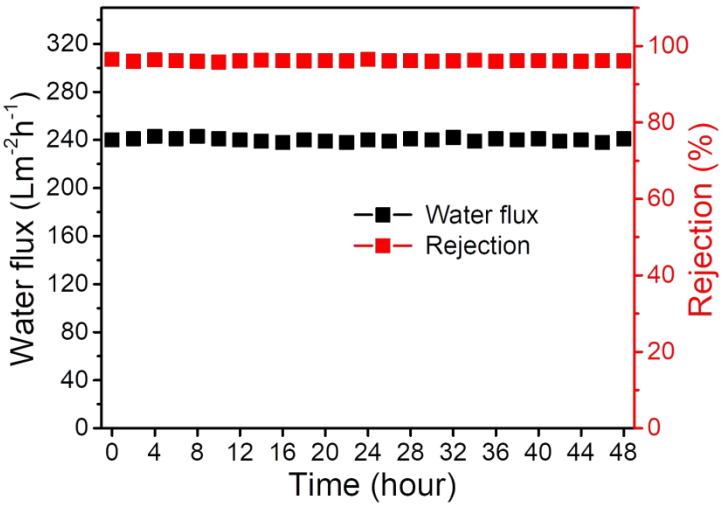

Figure S9. Variation of water flux and Na_2SO_4 rejection of the polyamide membrane as a function of separation time (Na_2SO_4 concentration: 1000 ppm, applied pressure: 6 bar). The separation performance of the polyamide membrane is stable during a 48-hour continuous test.