

Supporting Information

1. Chemical characterization of TFC membranes with different mass ratio of DA/MPD from XPS

XPS analysis was carried out to evaluate the elemental composition and chemical bonding of the top 5-10 nm of TFC membranes, which was assigned to the PA layers. Survey spectra of the TFC membranes with different mass ratio of DA/MPD was shown in Fig. S1. As an indication of polyamide structure within the top 5-10 nm, three major peaks of carbon, nitrogen and oxygen were observed from top of all the TFC membranes.

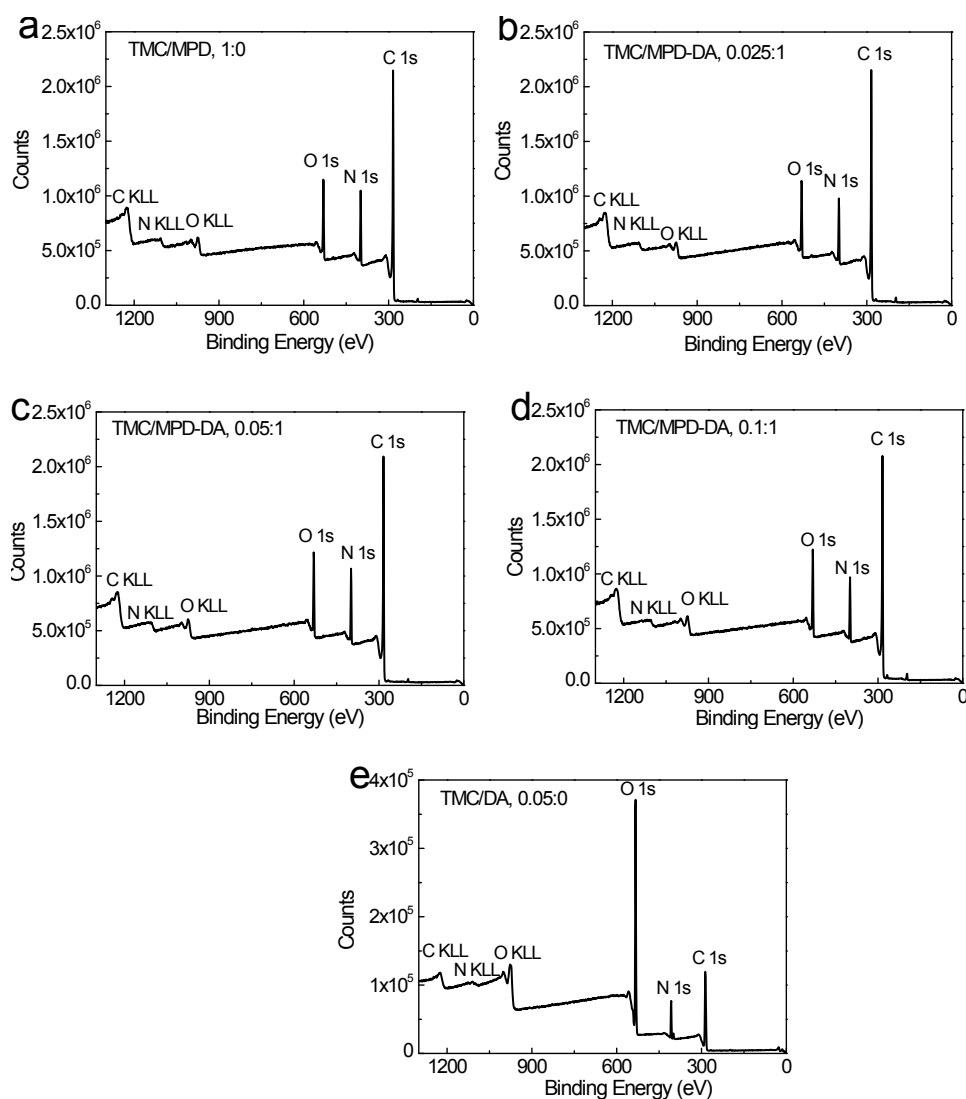


Fig. S1. XPS survey spectra of the TFC membranes with various mass ratio of DA/MPD in aqueous phase. (a) TMC/MPD without DA incorporation and with MPD of 2 wt.%, (b-d) DA-incorporated TFC membranes with DA/MPD mass ratio of 0.025:1, 0.05:1, and 0.1:1, respectively, (e) TMC/DA without MPD and with DA of 0.1 wt.%.

2. SEM morphology of MCE substrate

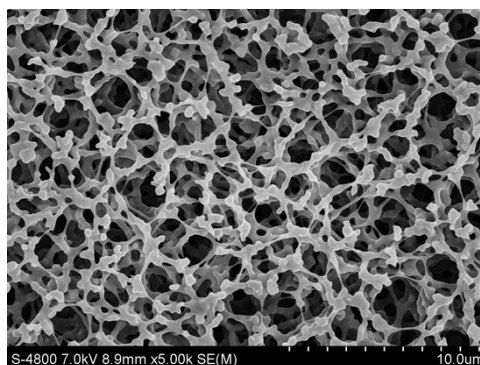


Fig. S2. SEM morphology of MCE membrane.

3. Water contact angle of the bottom surfaces of TFC membranes.

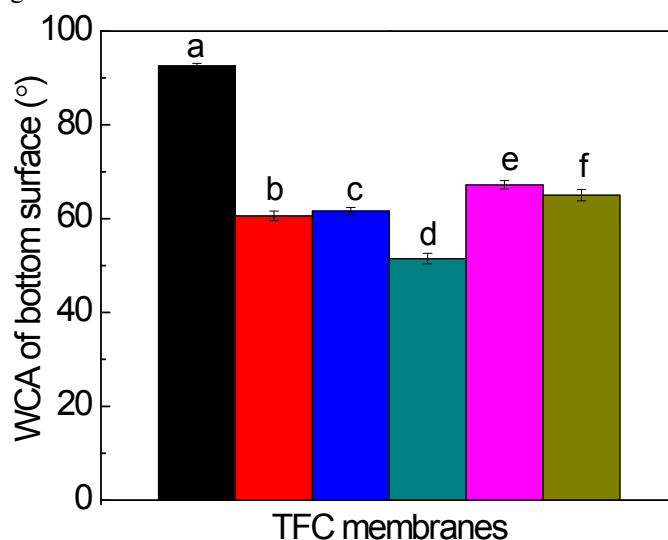


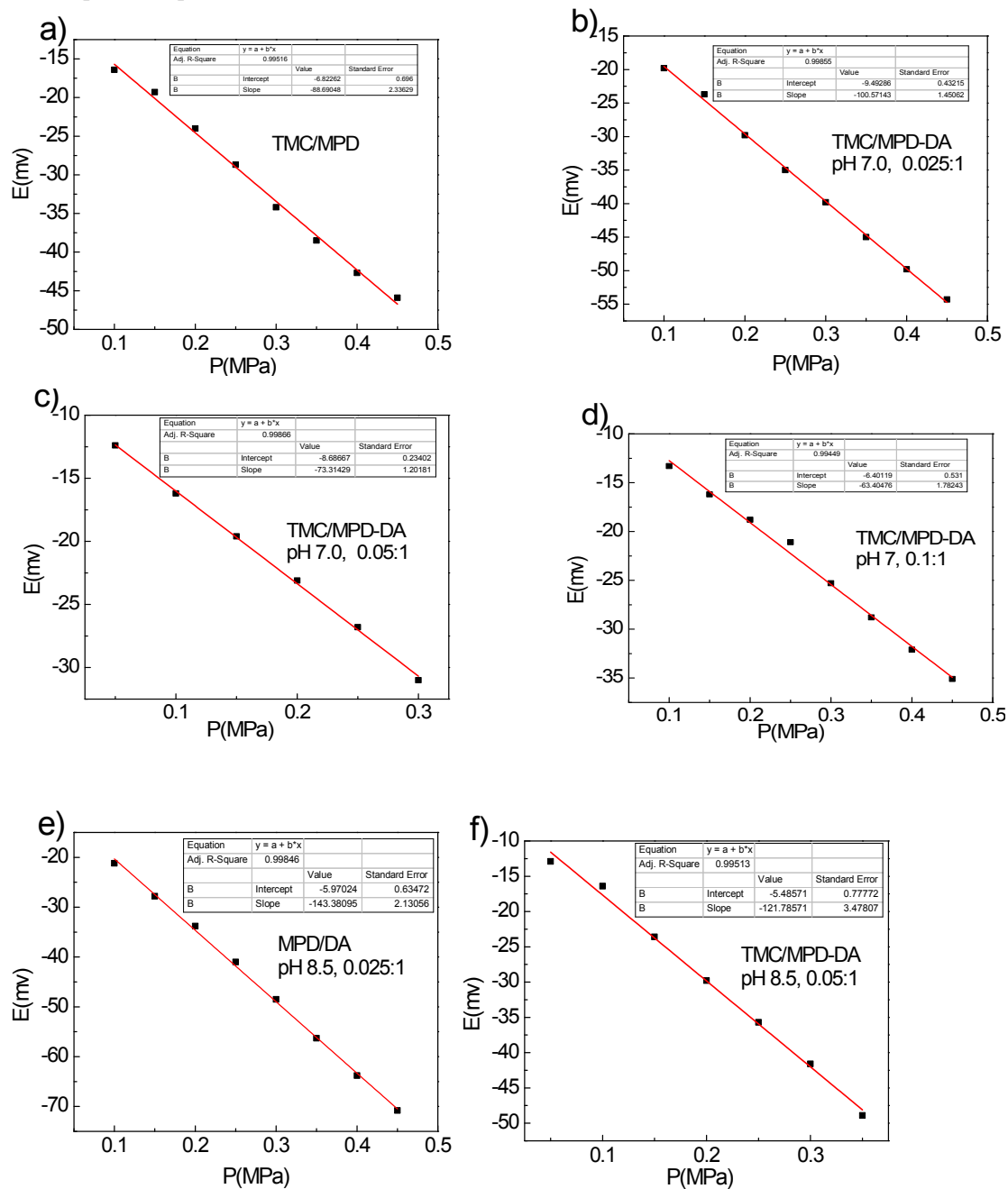
Fig. S3. Water contact angle of the bottom surfaces of TFC membranes. (a) TMC/MPD membrane, (b-d) TMC/MPD-DA membranes with the same DA/MPD ratio of 0.05:1 at various pH of 7.0, 8.5 and 10.0, respectively, (e-f) TMC/MPD-DA membranes at the same pH 8.5 with various DA/MPD ratios of 0.025:1 and 0.1:1, respectively.

4. Digital photos of the time-dependent water contact angle for DA-based TFC membrane top surface



Fig. S4. The corresponding digital photos of the time-dependent water contact angle for DA-based TFC membrane top surface

5. Zeta potential plots of the DA-based TFC membranes



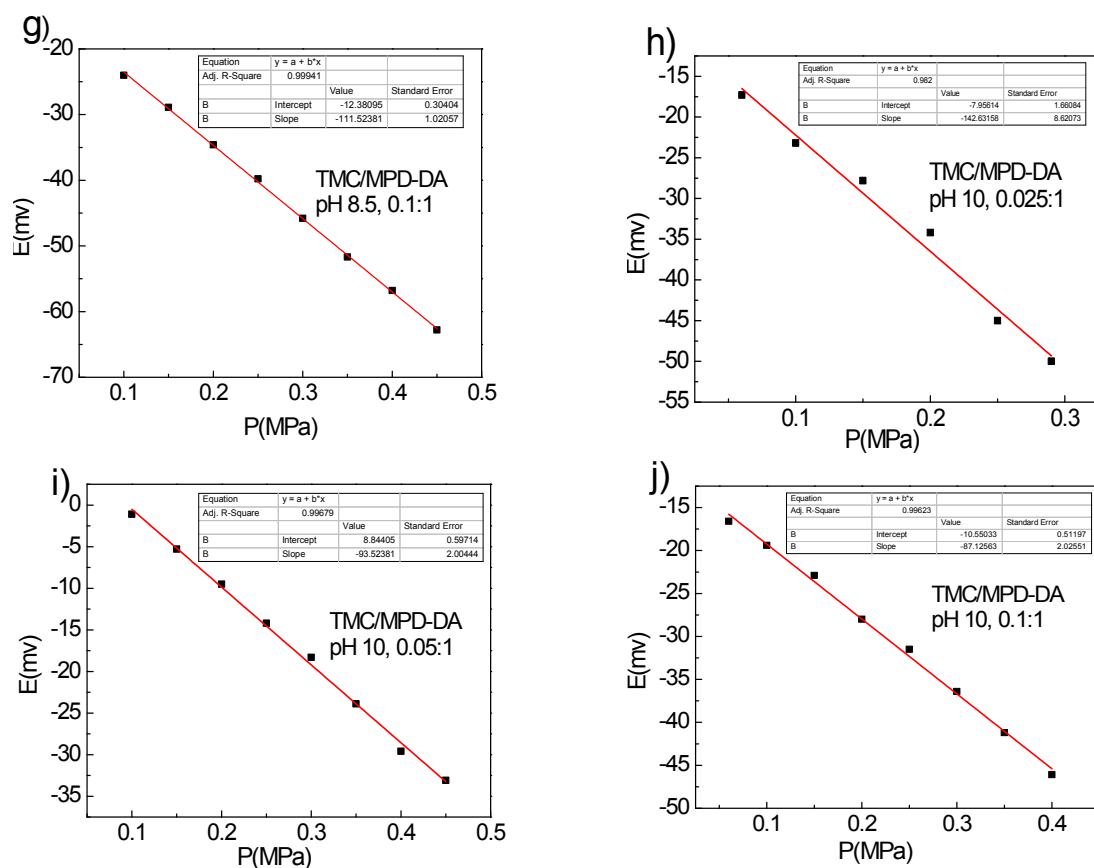


Fig. S5 Zeta potential plots of the DA-based TFC membranes under pH (7.0 ,8.5,10.0) with DA/MPD mass ratio of concentration of 0:1, 0.025:1, 0.05:1 and 0.1:1.

6. UV-Vis spectra of MPD-DA aqueous solutions with time and DA solution with different pH.

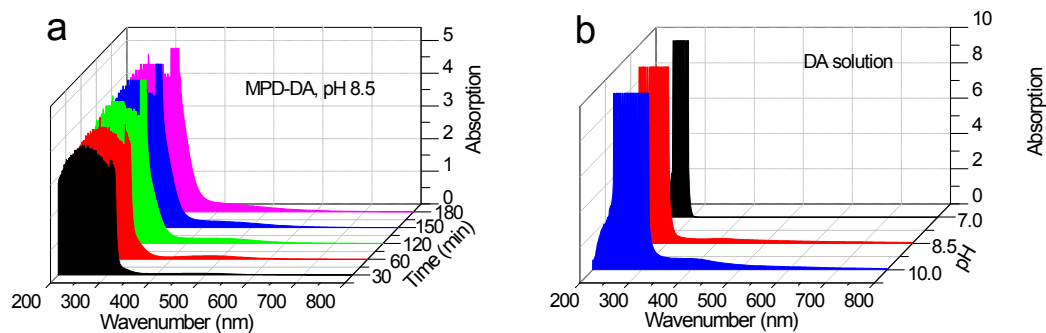


Fig. S6. UV-Vis spectra of (a) MPD-DA aqueous solutions with MPD/DA ratio of 0.05:1 at pH 8.5 as time and (b) DA solution at pH 7.0, 8.5 and 10.0.

7. Cyclic voltammetry curves of DA and MPD solution.

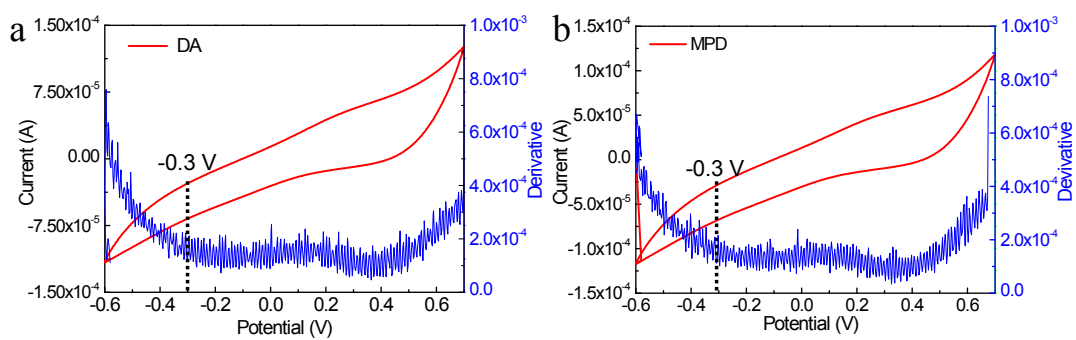


Fig. S7. Cyclic voltammetry curves of (a) DA and (b) MPD solution. The contents of MPD and DA at pH 8.5 were 2.0 and 0.01 wt.%, respectively.