Supporting Information for

Electro-active Forward Osmosis Membranes towards Phenolic Compounds Removal and Salts Rejection

Jingguo Li,[a] Qing Liu,[a] Yanbiao Liu[b,*] and Jianping Xie[a,*]

[a] Department of Chemical and Biomolecular Engineering, National University of Singapore, 4 Engineering Drive 4, 117585 Singapore. E-mail: chexiej@nus.edu.sg; Fax: +65 6516 1936; Tel: +65 6516 1067

[b] NUS Environmental Research Institute, National University of Singapore, 5A Engineering Drive 1, #02-01, 117411 Singapore. E-mail: eriliuyb@nus.edu.sg; Fax: +65 6872 1320; Tel: +65 6601 3302

Supporting Information: 1 table and 7 figures.

Table S1. Performance and structure parameters of the pristine PES and CNF-PES membranes.

Membranes	Porosity	Pure water flux ($L\ m^{-2}\ h^{-1}\ bar^{-1}$)	Structure parameter *S* (μm)
PES	75.2 ± 2.3	420 ± 15	485 ± 50
CNF-PES	62.4 ± 2.4	406 ± 12	543 ± 35

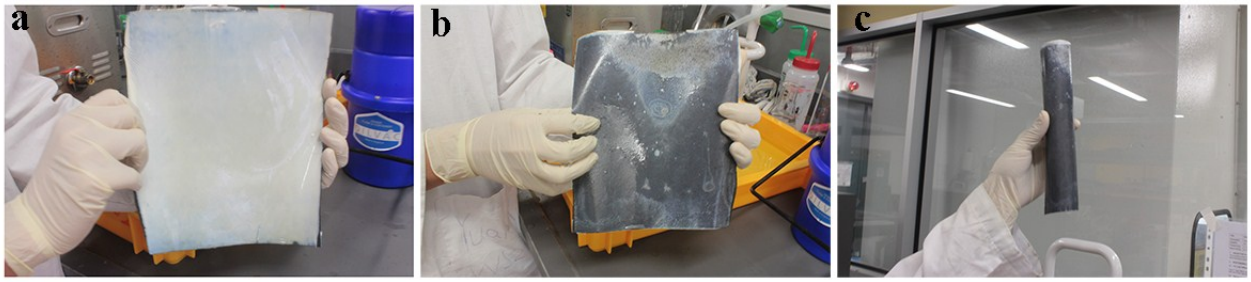

Figure S1. Optical images of the as-fabricated CNF-TFC membranes: top surface (a), back surface (b), and flexibility (c).

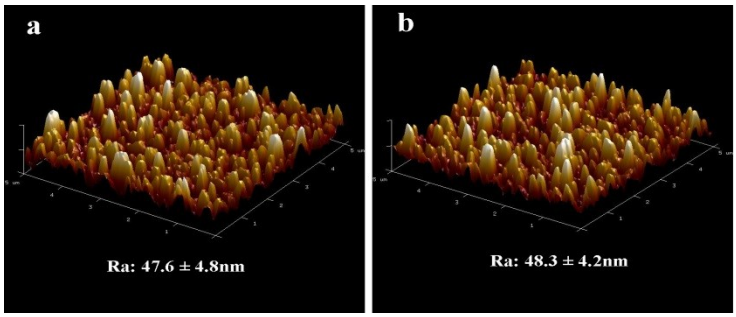

Figure S2. Representative top selective layer AFM images of the pristine TFC membrane (a) and the CNF-TFC membrane (b).

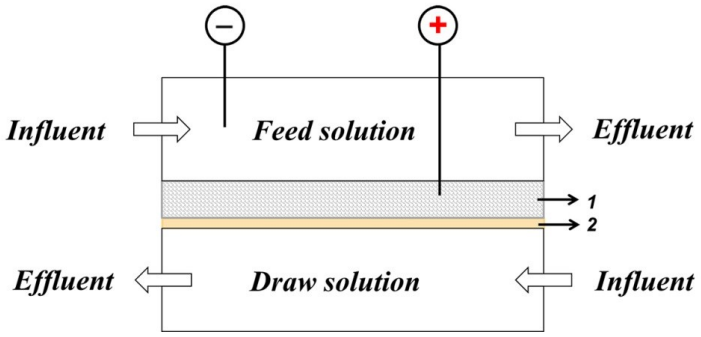

Figure S3. Schematic illustration of the electro-active FO testing cell: (1) electro-active layer; and (2) selective layer.

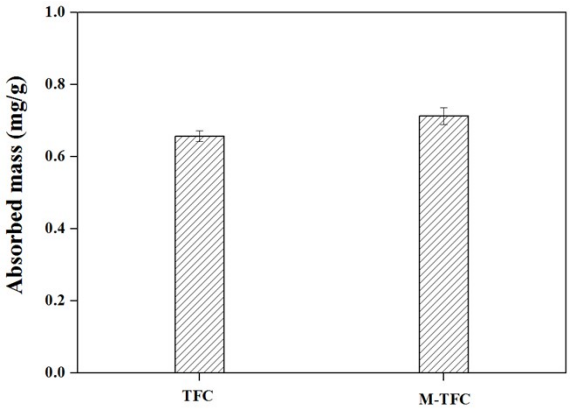

Figure S4. Physical absorption of phenol on the as-fabricated TFC and CNF-TFC membranes (phenol concentration: 5 mmol/L).

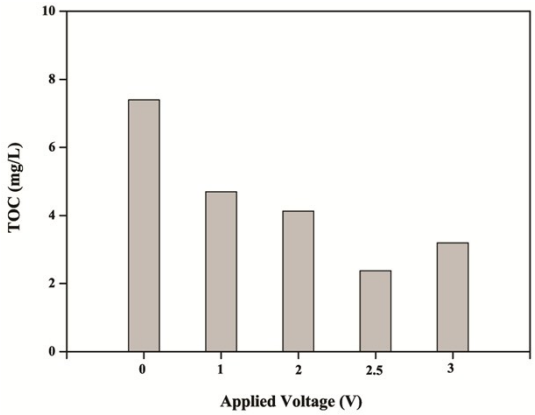

Figure S5. Total organic carbon (TOC) of the draw solution for the as-fabricated CNF-TFC membranes operated under different applied voltages.

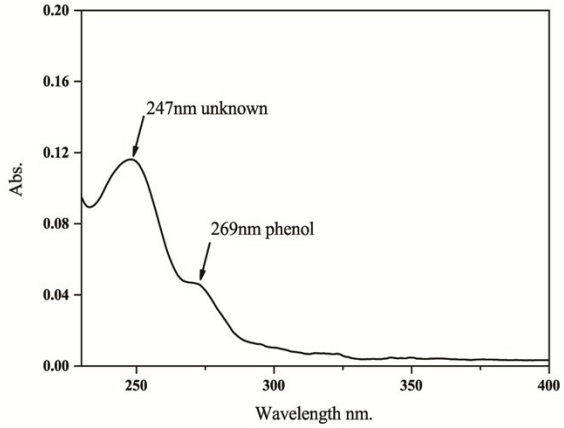

Figure S6. UV-Vis absorption spectrum of the draw solution when the applied voltage was above 2 V.

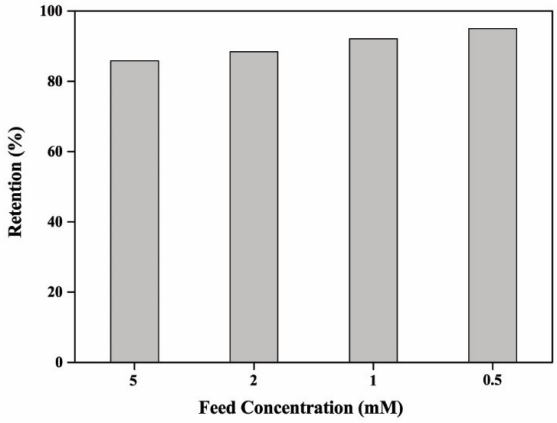

Figure S7. Phenol retention at different feed concentration (applied voltage: 2.5 V, phenol concentration: 5 mmol/L, and draw solution: 1 mol/L Na_2SO_4).