

## Electronic Supplementary Information (ESI)

### **Thin film nanocomposite membrane with pre-immobilized UiO-66-NH<sub>2</sub> toward enhanced nanofiltration performance**

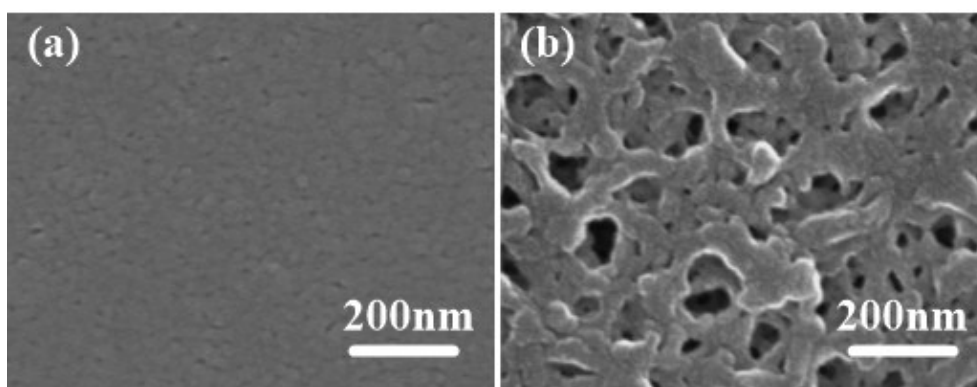
**Xu Zhang,<sup>§a</sup> Yufan Zhang,<sup>§b</sup> Tiecheng Wang,<sup>a</sup> Zheng Fan,<sup>a</sup> Guoliang Zhang\*,<sup>a</sup>**

<sup>a</sup> *Institute of Oceanic and Environmental Chemical Engineering, State Key Lab Breeding Base of  
Green Chemical Synthesis Technology, Zhejiang University of Technology, Chaowang Road 18#,  
Hangzhou, Zhejiang 310014, China*

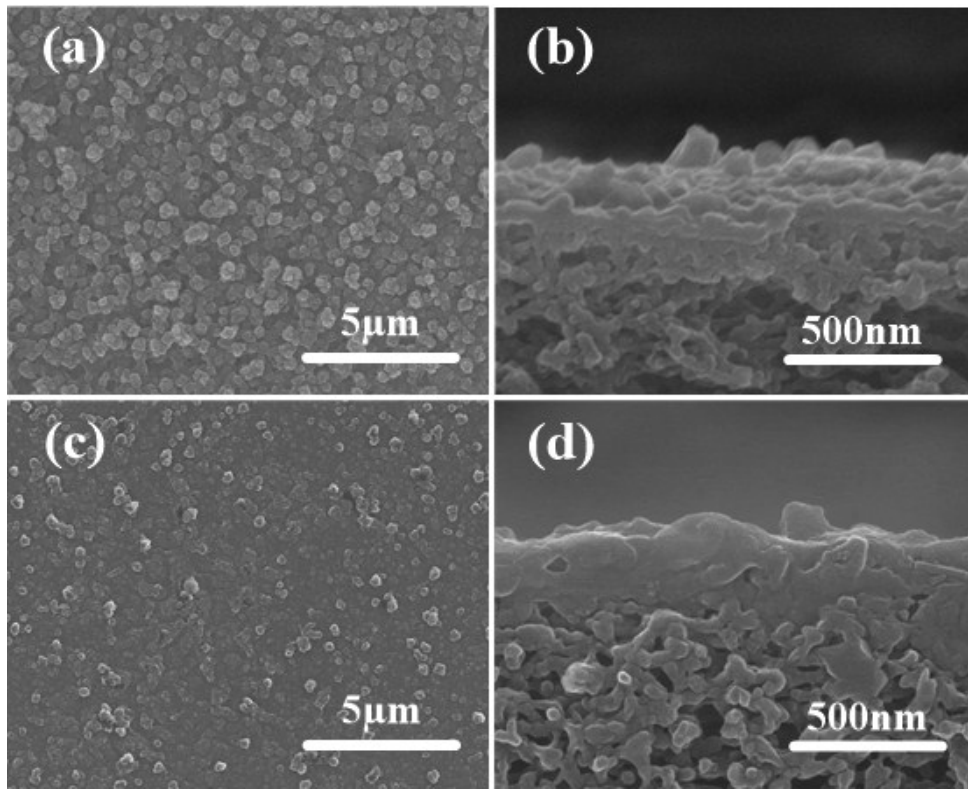
*Tel/Fax: 86-571-88320863*

<sup>b</sup> *Department of Mechanical Engineering, College of Engineering, Carnegie Mellon University,  
Pittsburgh, PA 15213, USA*

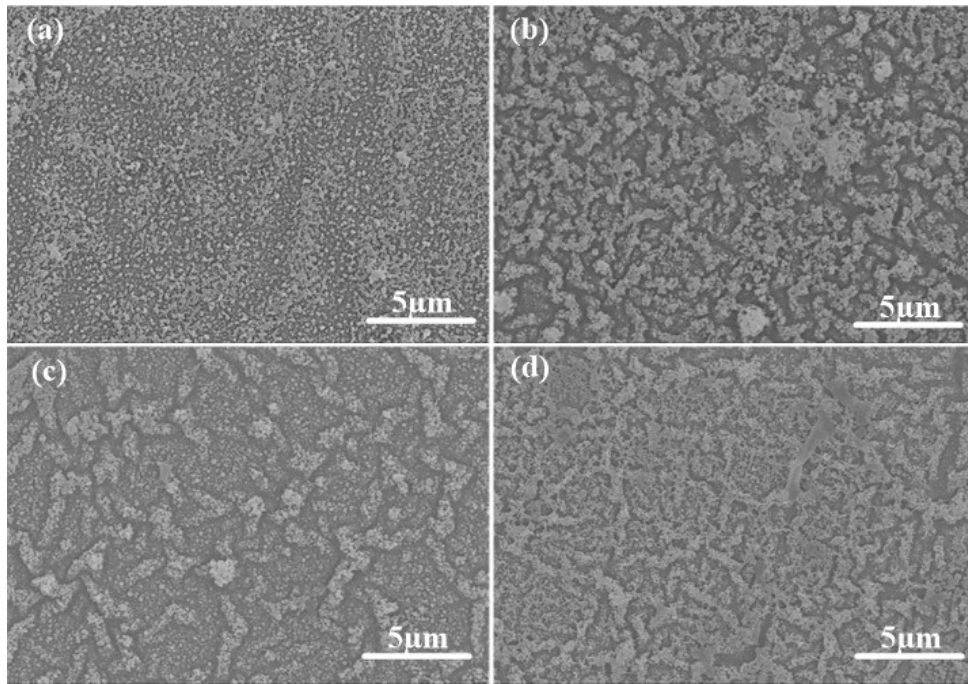
*\*Corresponding author E-mail: [guoliangz@zjut.edu.cn](mailto:guoliangz@zjut.edu.cn)*



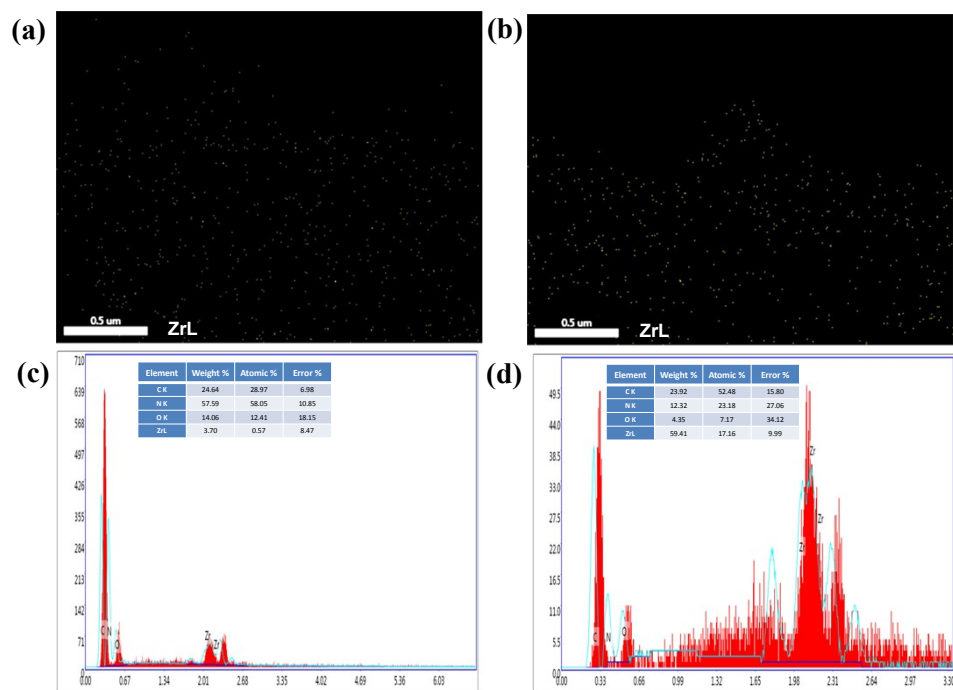
**Fig. S1.** SEM images of PSF and PSF@PDA.



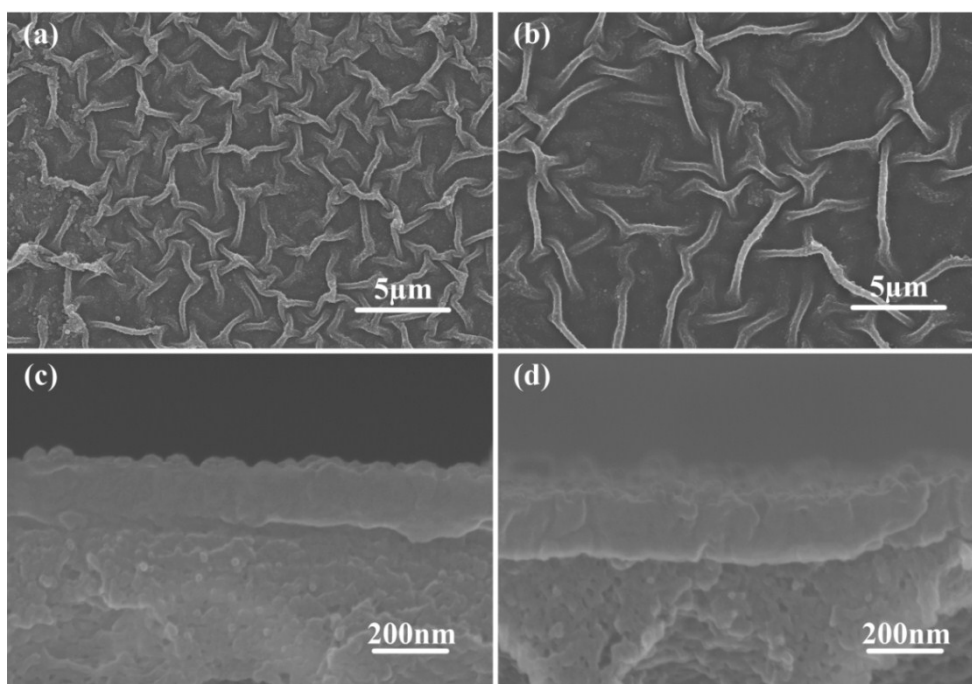
**Fig. S2.** The surface and cross-sectional SEM images of TFC membrane (a, b) and PA membrane with PDA@PSF as substrate (c, d).



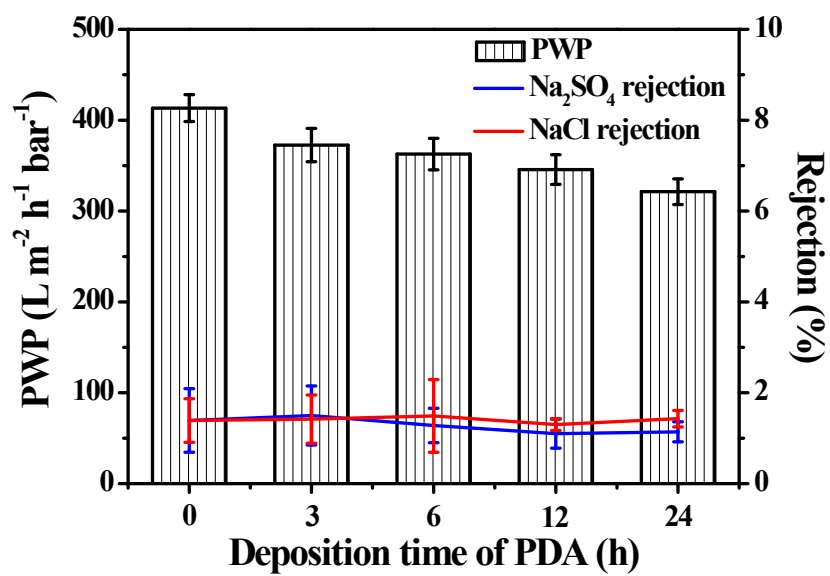
**Fig. S3.** SEM images of the membrane surface: TFN-3h (a), TFN-6h (b), TFN-12h (c), and TFN-24h (d).



**Fig. S4.** EDX images of TFN/Uio-66-NH<sub>2</sub> membrane (a, c) and PA/Uio-66-NH<sub>2</sub> membrane (b, d).



**Fig. S5.** The surface (a) and (b), and cross-sectional (c) and (d) SEM images of TFN/Uio-66-NH<sub>2</sub> (PES) and TFN/Uio-66-NH<sub>2</sub> (PAN).



**Fig. S6.** PWP and salt rejection of pure PSF substrate and PDA-coated PSF membrane.

**Table S1** Comparisons of TFN/UiO-66-NH<sub>2</sub> membrane with other MOF-based NF membranes from literatures

Membrane	Required amount of nanofillers	Test condition	Salt	Permeability (L m <sup>-2</sup> h <sup>-1</sup> bar <sup>-1</sup> )	Rejection (%)	Ref
TFN-ZIF-8	0.5 w/v%	1 g/L, 6 bar	Na <sub>2</sub> SO <sub>4</sub>	9.17	95	9
TFN-mZIF-2	0.1 w/v%	1 g/L, 4 bar	Na <sub>2</sub> SO <sub>4</sub>	14.90	93	16
PA/UiO-66	0.15 w/v%	1g/L, 10 bar	Na <sub>2</sub> SO <sub>4</sub>	11.5	92	26
			MgSO <sub>4</sub>		93	
			MgCl <sub>2</sub>		90	
PSF/ZIF-8/PA	Large	1g/L,	MgSO <sub>4</sub>	4	91	38
TFN-GO/ZIF-8	0.2 w/v%	1g/L, 4 bar	Na <sub>2</sub> SO <sub>4</sub>	4.06	~100	39
			MgSO <sub>4</sub>		77	
			MgCl <sub>2</sub>		10.5	
PA/ZIF-8 (LBL)	Large	1g/L, 10 bar	MgSO <sub>4</sub>	2.71	45	40
UiO-66	Pure MOF membrane	2 g/L, 10 bar	MgCl <sub>2</sub>	0.14	98	22
NH <sub>2</sub> -MIL-101(Al) /Chitosan	15 w/v%	2g/L,	MgCl <sub>2</sub>	4.0	93	41
			Na <sub>2</sub> SO <sub>4</sub>		10	
TFN/hollow ZIF-8	0.04 w/v%	1 g/L, 6 bar	Na <sub>2</sub> SO <sub>4</sub>	19.4	95.2	42
TFN/UiO-66	0.01 w/v%	1 g/L, 6 bar	Na <sub>2</sub> SO <sub>4</sub>	13.0	98.1	This work
			MgSO <sub>4</sub>		94.8	
			MgCl <sub>2</sub>		76.8	