Electronic Supplementary Information

Graphene oxide embedded polyamide nanofiltration membranes for selective ion separation

Ruirui Hu[1], Yijia He[1], Cuimiao Zhang[2], Rujing Zhang[1], Jing Li[1], Hongwei Zhu[1]

[1]State Key Lab of New Ceramics and Fine Processing, School of Materials Science and Engineering, and Center for Nano and Micro Mechanics, Tsinghua University, Beijing 100084, China

[2]Beijing Origin Water Membrane Technology Co., Ltd., Beijing 101407, China

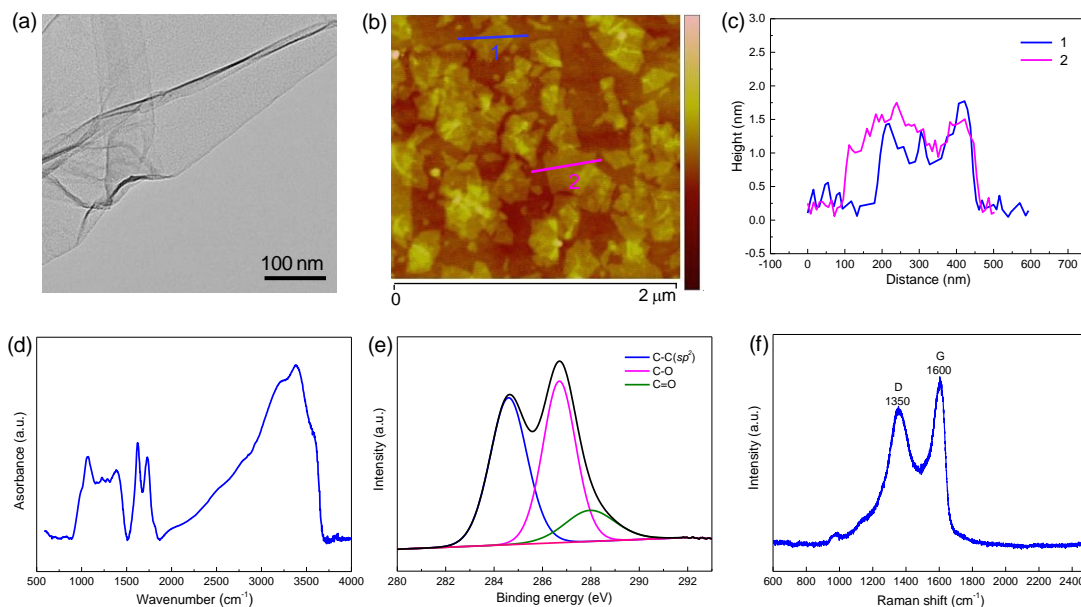**Figures S1-S4**
Table S1

Figure S1. Characterizations of GO nanosheets. (a) TEM; (b) AFM; (c) AFM height profiles of GO (marked with blue and red lines in (b)); (d) FTIR; (e) XPS; (f) Raman.
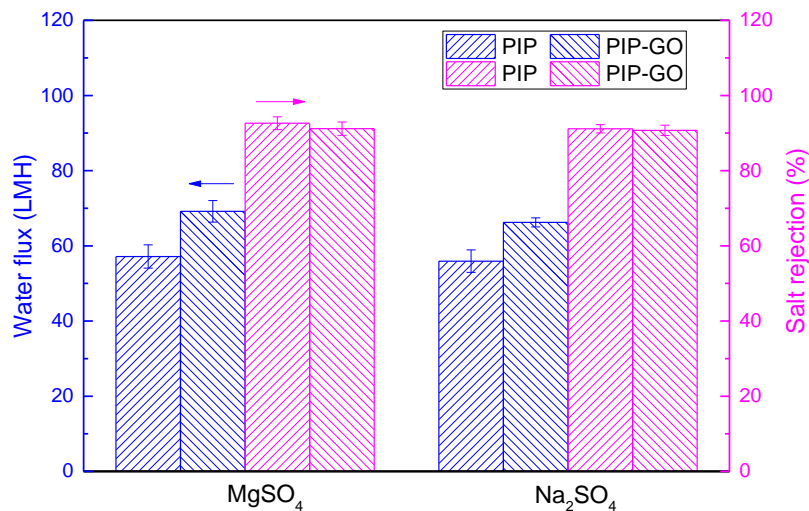
Figure S2. Ion sieving performance of PIP and PIP-GO membranes for MgSO$_4$ and Na$_2$SO$_4$.
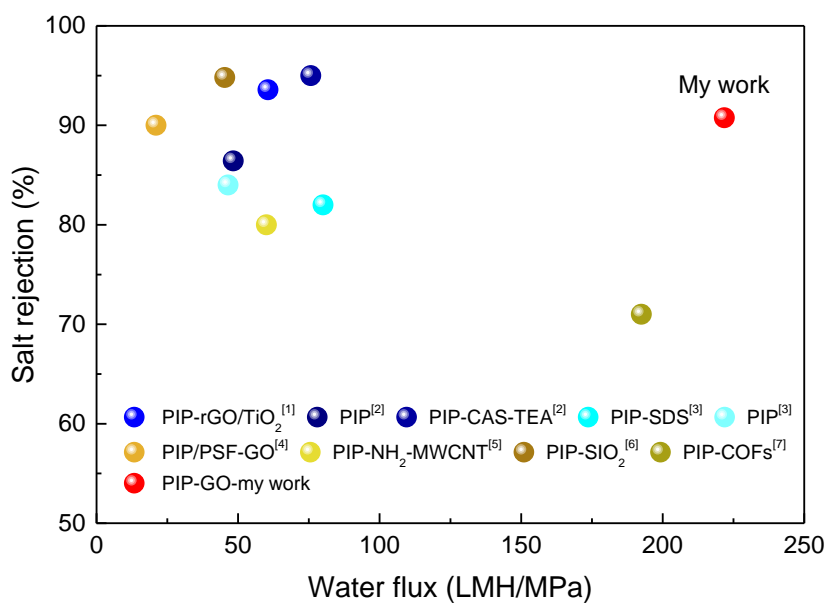

Figure S3. Comparison of MgSO$_4$ or Na$_2$SO$_4$ separation performance of PIP-GO membrane with those reported PIP-based nanofiltration membranes.
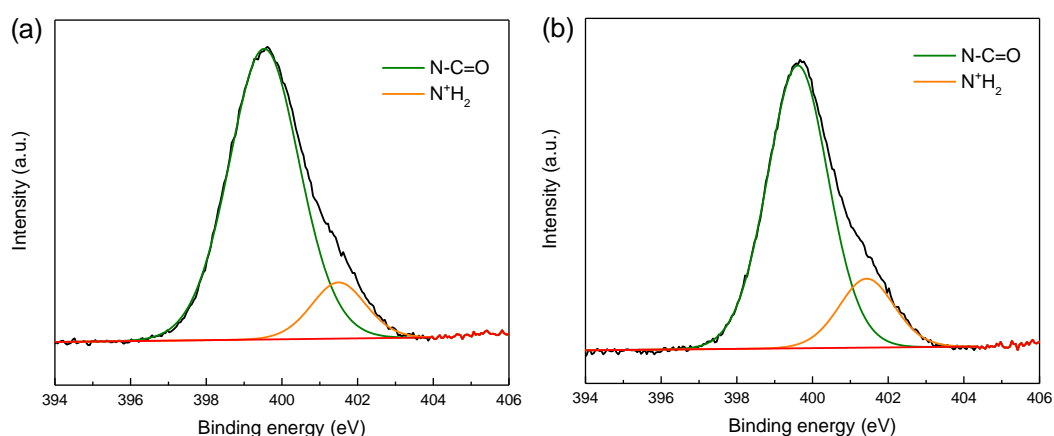
Figure S4. XPS narrow scans of N1s of (a) PIP and (b) PIP-GO membranes.

Table S1. Narrow scans of N1s from XPS results of PIP and PIP-GO membranes.

	Binding energy (eV)	Species	%
PIP	399.5	N-C=O	87.04
	401.5	N^+H_2	12.96
PIP-GO	399.6	N-C=O	81.94
	401.4	N^+H_2	18.06

References

[1] M. Safarpour, V. Vatanpour, A. Khataee, M. Esmaeili, *Separation and Purification Technology*, 2015, **154,** 96-107.

[2] J. Xiang, Z. Xie, M. Hoang, K. Zhang, Desalination, 2013, **315,** 156-163.

[3] Y. Mansourpanah, S. Madaeni, A. Rahimpour, Journal of Membrane Science, 2009, **343**, 219-228.

[4] G. Lai, W. Lau, P. Goh, A. Ismail, N. Yusof, Y. Tan, Desalination, 2016, **387**, 14-24.

[5] H. Zarrabi, M.E. Yekavalangi, V. Vatanpour, A. Shockravi, M. Safarpour, Desalination, 2016, **394**, 83-90.

[6] Q. Li, Y. Wang, J. Song, Y. Guan, H. Yu, X. Pan, F. Wu, M. Zhang, Applied Surface Science, 2015, **324**, 757-764.

[7] C. Wang, Z. Li, J. Chen, Z. Li, Y. Yin, L. Cao, Y. Zhong, H. Wu, Journal of Membrane Science, 2017, **523,** 273-281.