

Supporting Information

Preparation and characterization of novel alkali-resistant nanofiltration membranes with enhanced permeation and antifouling properties: the effects of functionalized graphene nanosheets

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S1. Compositions of the casting solutions.

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Membrane	PES (g)	SG (g)	GO (g)	PVP K30 (g)	NMP (g)	Acetone (g)
Blank	27.0	0	0	1.0	62.0	10.0
PES-0.05-SG	27.0	0.05	0	1.0	61.95	10.0
PES-0.10-SG	27.0	0.10	0	1.0	61.90	10.0
PES-0.15-SG	27.0	0.15	0	1.0	61.85	10.0
PES-0.30-SG	27.0	0.30	0	1.0	61.70	10.0
PES-0.05-GO	27.0	0	0.05	1.0	61.95	10.0
PES-0.10-GO	27.0	0	0.10	1.0	61.90	10.0
PES-0.15-GO	27.0	0	0.15	1.0	61.85	10.0
PES-0.30-GO	27.0	0	0.30	1.0	61.70	10.0

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S2. Elemental analysis of GO and SG.

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	C(%)	H(%)	S(%)	O(%)
GO	48.41	2.65	0.86	48.08
SG	37.82	3.00	9.14	50.04

S3. Color of membrane top surfaces.



Fig. S1 Color change of membrane top surfaces

S4. Viscosity of casting solutions.

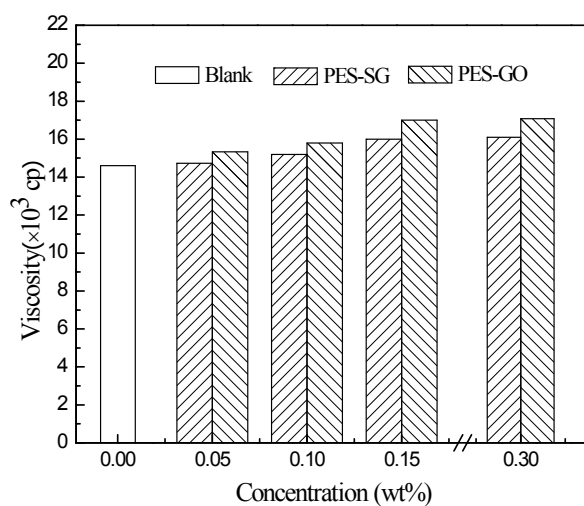


Fig. S2 Viscosity of casting solutions

S5. Cross-sectional morphology of membranes.

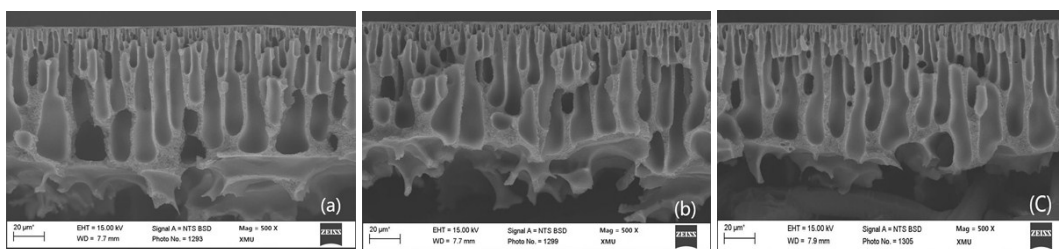


Fig. S3 Cross-sectional SEM images of PES-SG membranes with different SG concentrations: (a) 0 wt%, (b) 0.1 wt% (C) 0.3 wt%

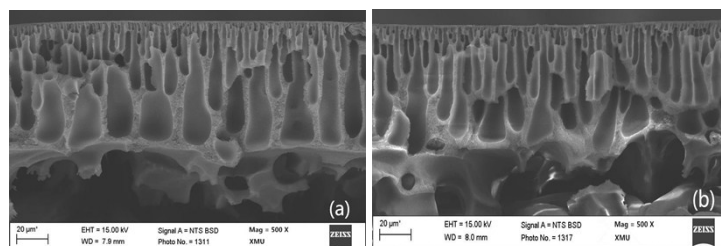


Fig. S4 Cross-sectional SEM images of PES-GO membranes with different GO concentrations: (a) 0.1 wt%, (b) 0.3 wt%.

S6. Zeta potentials of functional graphenes.

The zeta-potentials of functional graphenes were evaluated by particle-size analyzer (Nano-Zetasizer 90, Malvern Instruments, UK). Before test, a measured concentration of functional graphenes were ultrasonicated in water bath for 1 h to obtain stable GO and SG suspension.

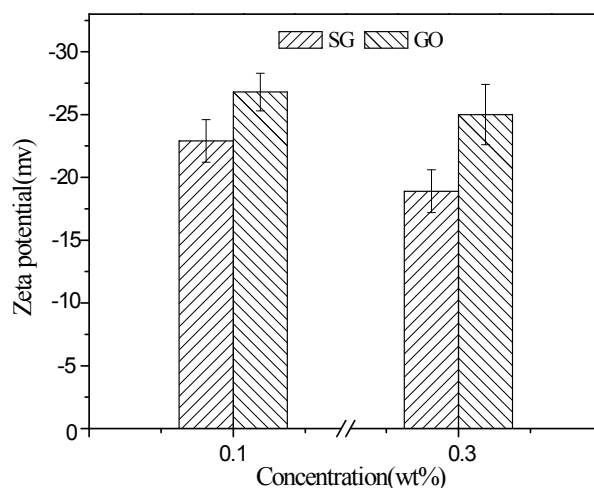


Fig. S5 Zeta potentials of functional graphene nanosheets