

## **Electronic Supplementary Information**

### **Reduced graphene oxide nanofiltration membrane intercalated by well-dispersed carbon nanotubes for drinking water purification**

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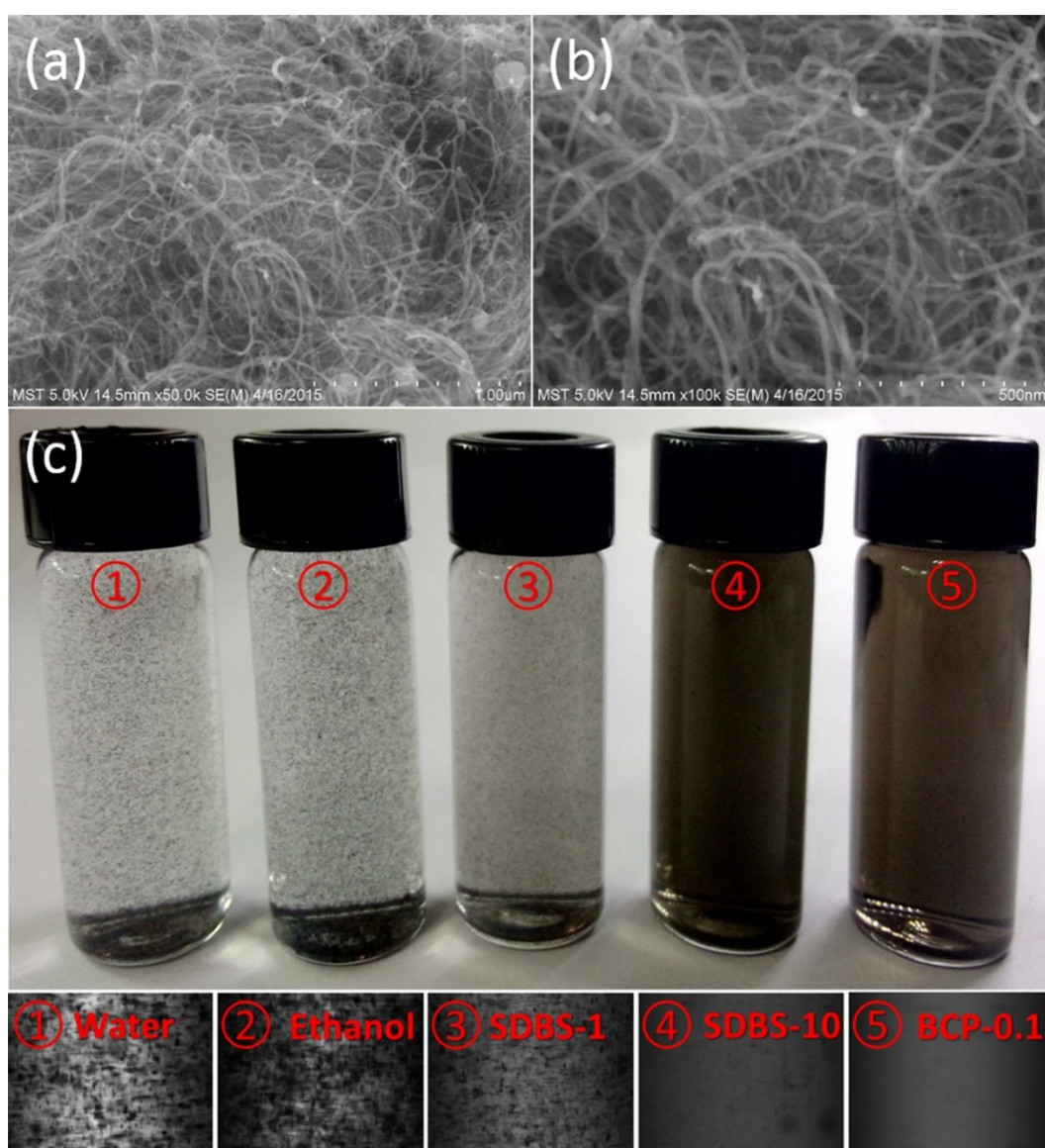
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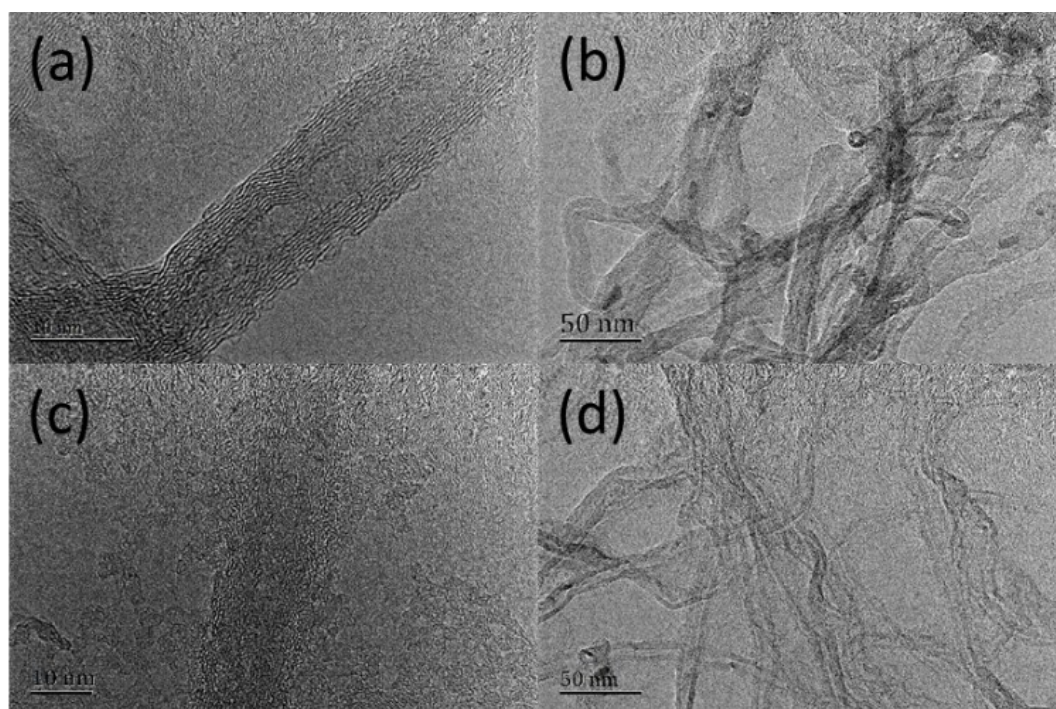
E-mail: yiqunfan@njtech.edu.cn



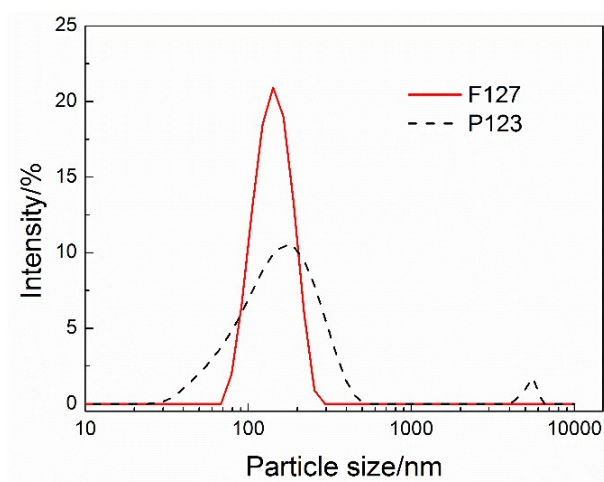
**Fig. S1** Photos of AAO substrate (left) and rGO-CNTs hybrid NF membrane (right).



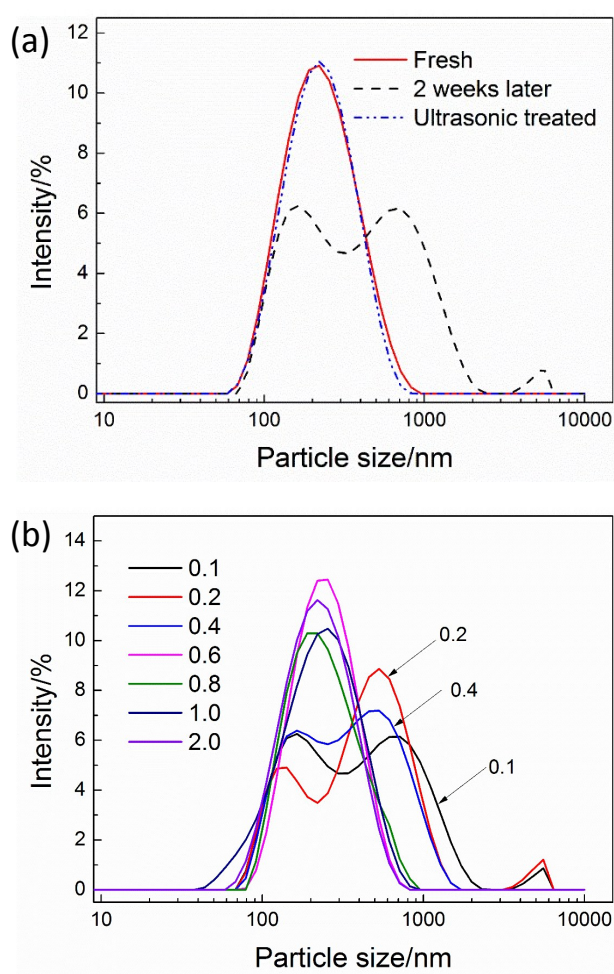
**Fig. S2** (a, b) FESEM images of CNTs. (c) Digital images of CNTs dispersions. c-1: water, c-2: ethanol, c-3: water (SDBS: CNTs=1:1), c-4: water (SDBS: CNTs=10:1), c-5: water (BCPs: CNTs=0.1:1).



**Fig. S3** TEM images of CNTs without (a, b) and with (c, d) the addition of BCPs

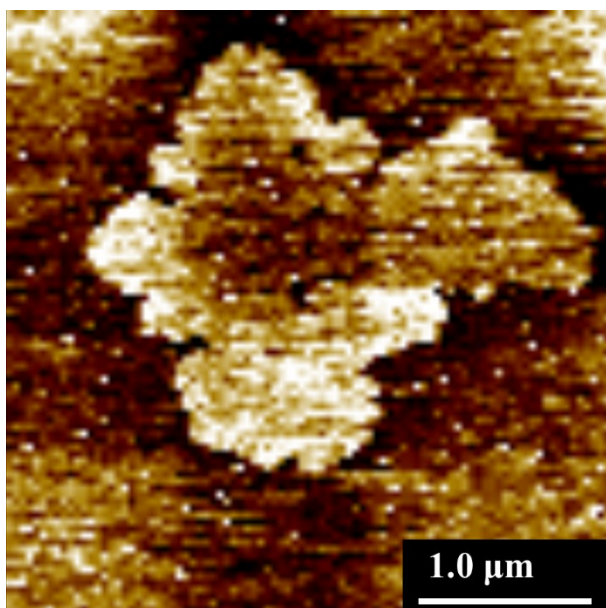


**Fig. S4** Particle size dispersion of CNTs at the mass ratio  $m(\text{BCPs}): m(\text{CNTs})$  of 0.8.

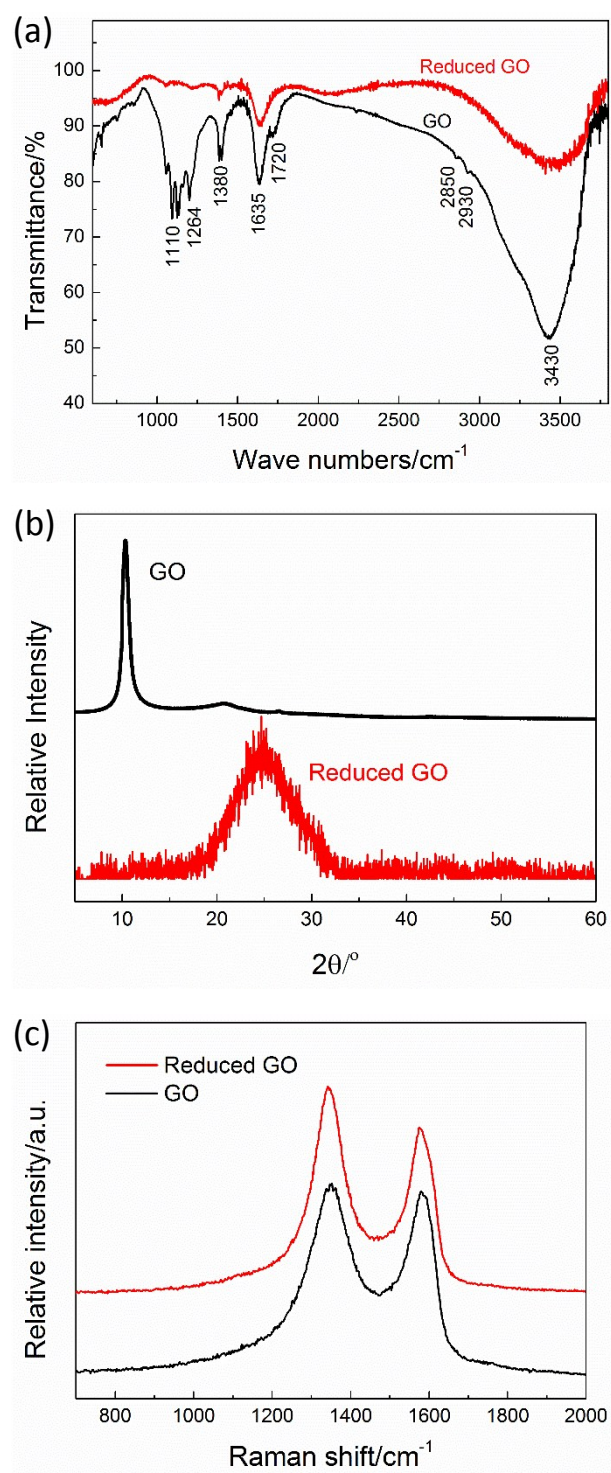


**Fig. S5** (a) Effect of aging and retreatment on the particle size distribution of CNTs dispersion. (b) Effects of F127 adding amount on the particle size distribution of CNTs of 0.02 mg/mL.

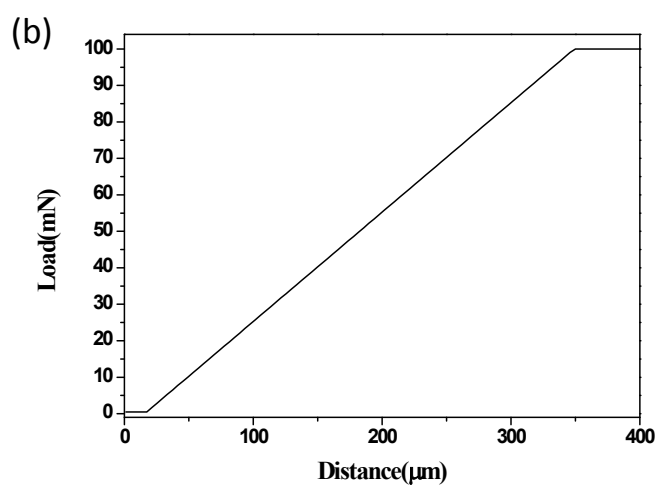
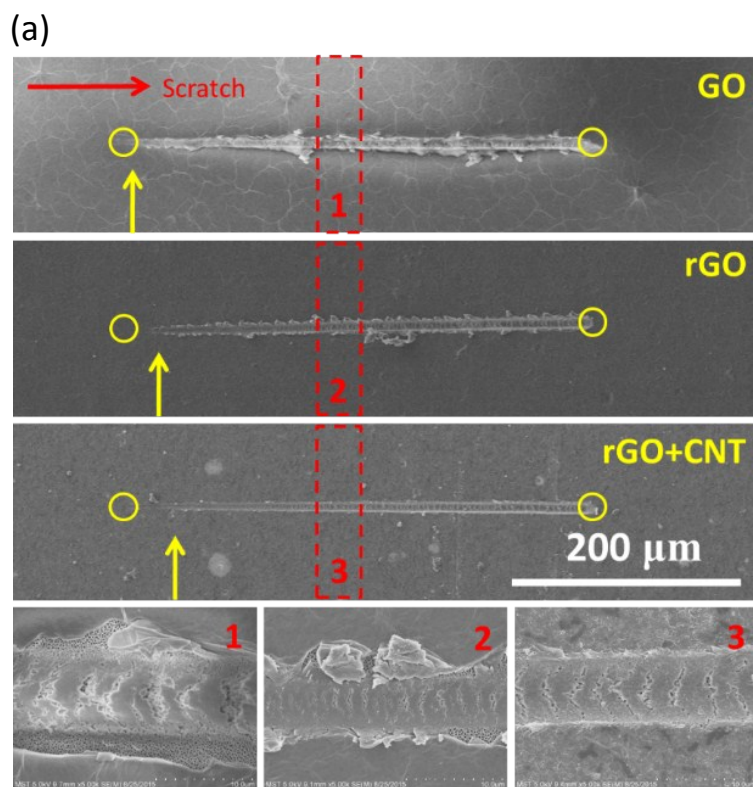




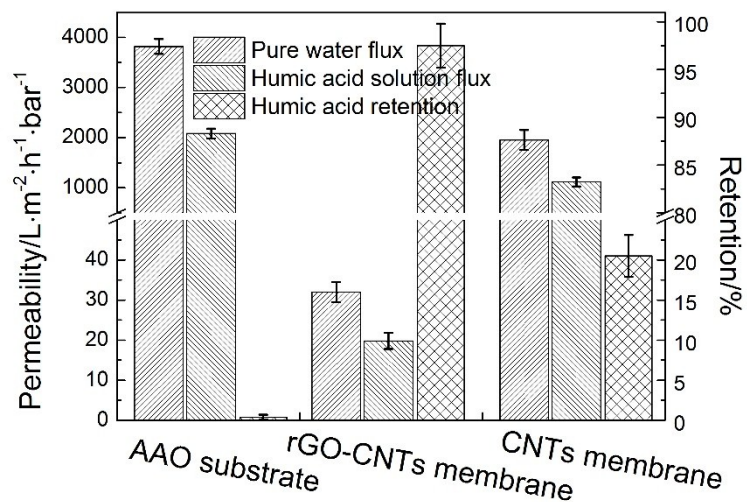
**Fig. S6** AFM image of reduced GO sheet on mica.



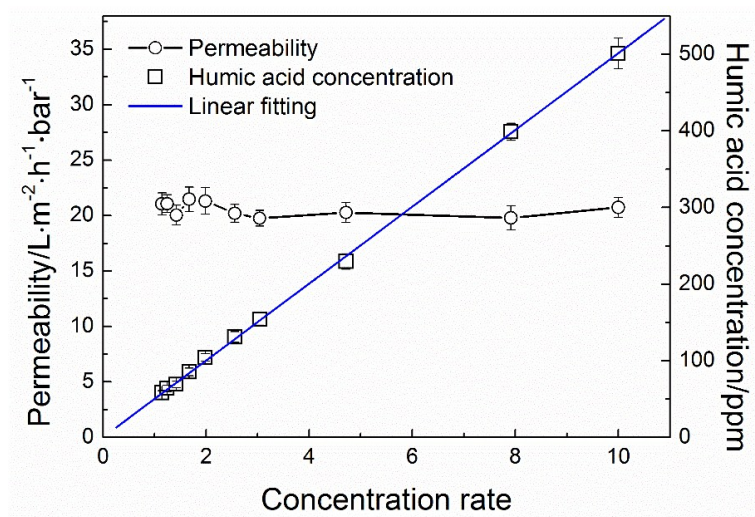
**Fig. S7** (a) FTIR spectrum, (b) XRD spectrum and (c) Raman spectrum of GO and reduced GO.



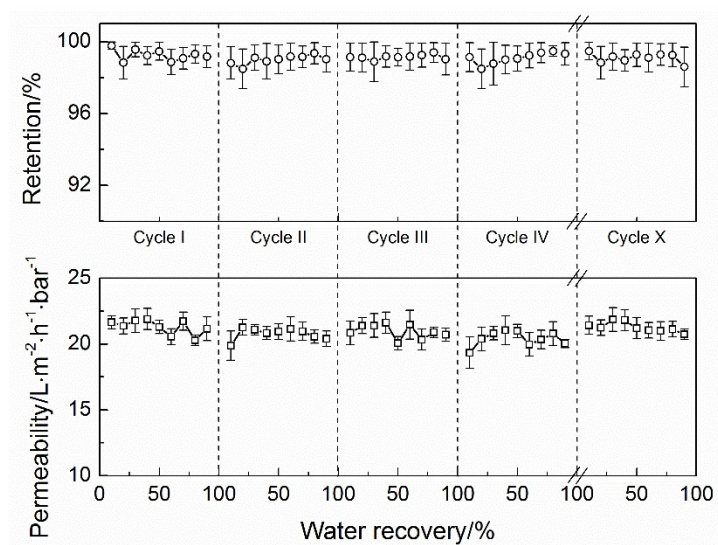
**Fig. S8** (a) Comparison of the microstructure of surface scratches on different graphene-based membranes. (b) The relationship between the load force and the scratch distance.



**Fig. S9** Comparison of AAO substrate, rGO-CNTs hybrid NF membrane and CNTs membrane on the permeability and retention performance.

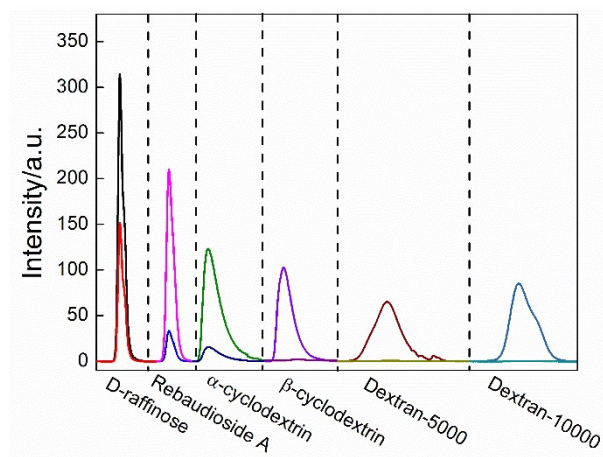


**Fig. S10** Effect of concentration rate on the humic acid concentration in feed side.

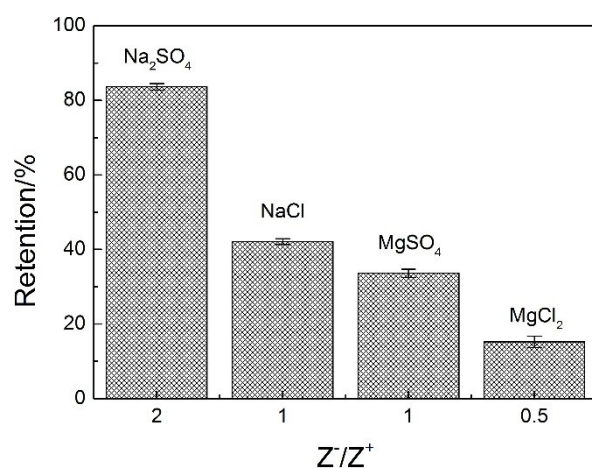




**Fig. S11** Performance of rGO-CNTs hybrid NF membranes for removing humic acid



**Fig. S12** Performance of rGO-CNTs hybrid NF membranes for the retention of various sugars.



**Fig. S13** Retention properties for different salts with different ion valences.

**Table S1** Performance of rGO-CNT membranes with different CNTs loadings

Sample name		GM-1-1	GM-2-1	GM-4-1	GM-8-1	GM-1-0
m(rGO):m(CNTs)	mass ratio	1:1	2:1	4:1	8:1	1:0
Pure water	$J_0 / \text{L} \cdot \text{m}^{-2} \cdot \text{h}^{-1} \cdot \text{bar}^{-1}$	96.8	31.5	12.8	3.6	0.7
Direct Red 80	R/%	>99	>99	>99	>99	>99
Chlorazol Fast Pink	R/%	95.3	>99	>99	>99	>99
Chlorazol Black	R/%	90.5	>99	>99	>99	>99
Titan Yellow	R/%	88.6	>99	>99	>99	>99
Methyl Orange	R/%	60.1	97.3	98.2	98.5	98.5