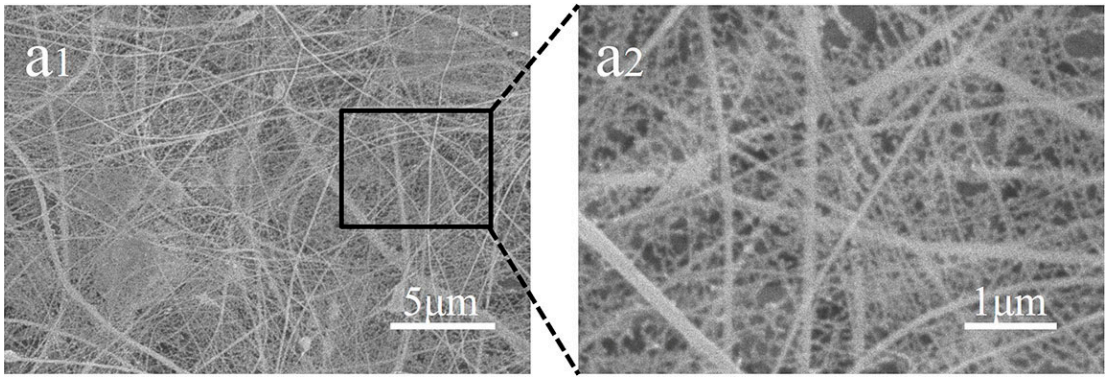
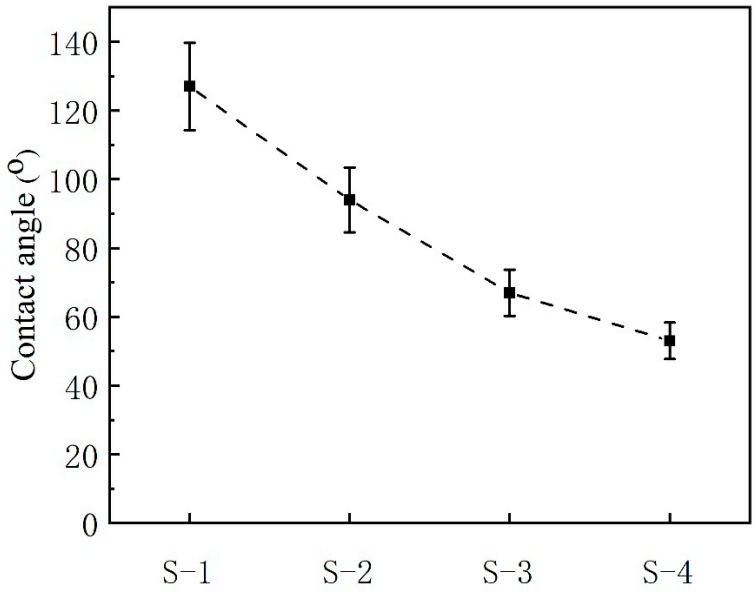
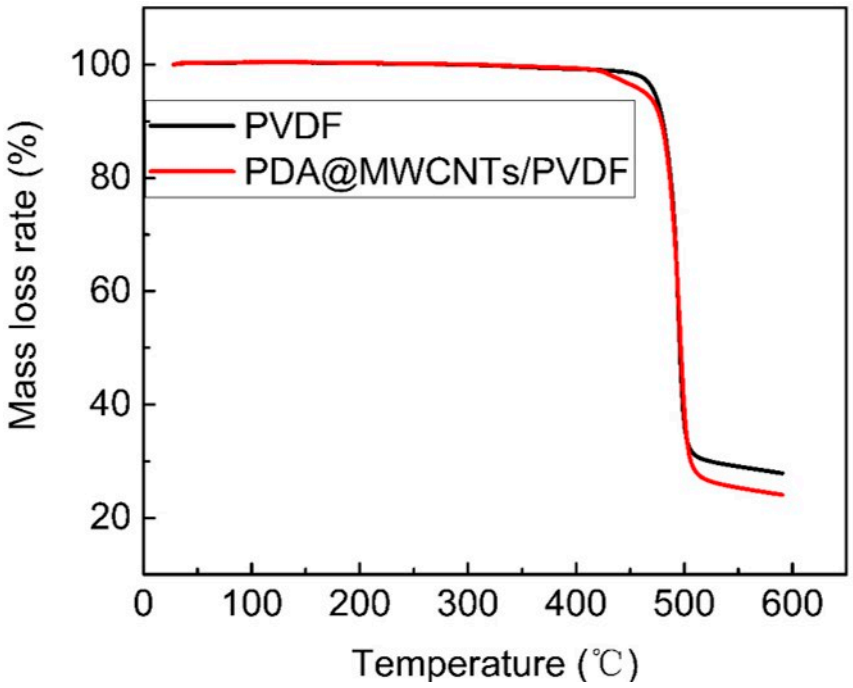
1. Supplementary figure



Supplementary **Figure S1.** (a1, a2) Tree-like nanofiber membrane SEM images.

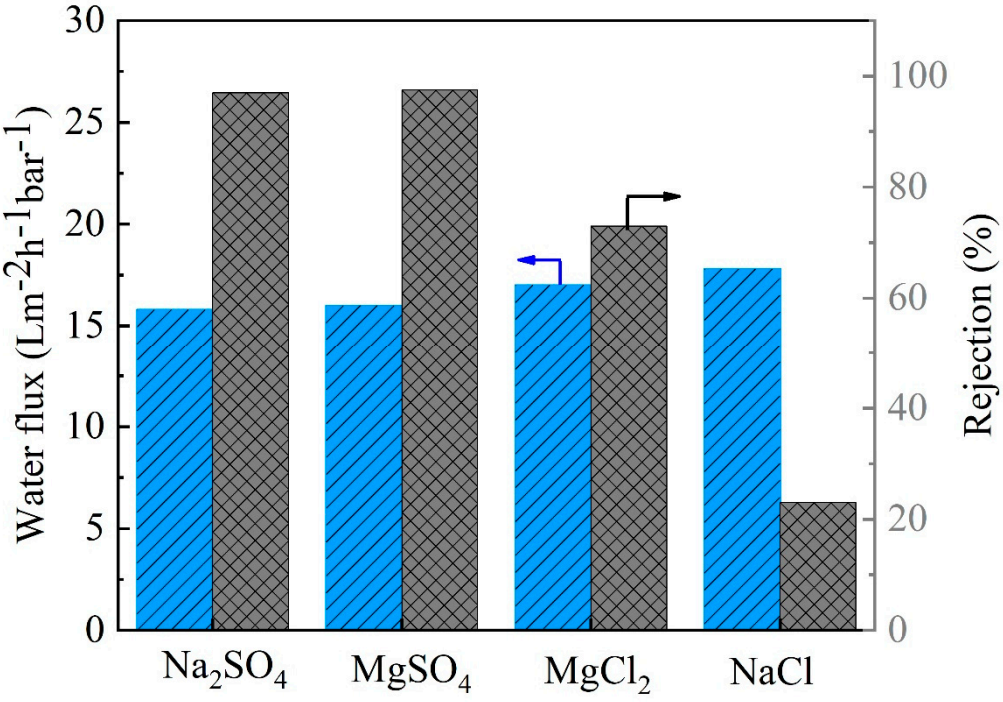


Supplementary **Figure S2**. The contact angle of various support layer.



Supplementary **Figure S3.** TG curves of PVDF nanofiber membrane and PDA@MWCNTs/PVDF membrane.

The thermal stability of PA TFC membrane is a crucial indicator in practical application. The TG curves (Supplementary Figure S2) indicates the nanofiber membrane and PDA@MWCNTs membrane both keep excellent stability under 400 °C.



Supplementary **Figure S4**. The rejection of membrane TFC-3 to various salt solution.

Supplementary Table S1. Comparison of the result in this work with other results of report for Na_2SO_4 separation performance.

PA TFC membrane	Salt rejection (%)	Water flux (LMH bar^{-1})	Ref
MWCNTs/PSF support	75	2.33	[1]
CNTs/PA film	99.1	25.1	[2]
Modified-MWCNTs/PA film	99	6.98	[3]
Metal Organic Framework/PA film	65	39.5	[4]
Control PA film	97	17.17	[4]
Improve IP reaction	96	34.7	[5]
o-POPs/PA film	94.9	29.6	[6]
Reactable substrate	6.2	6.3	[7]
PDA@MWCNTs/PVDF Support	97	15.8	This work

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