Supporting Information

Selective separation of dye/salt mixture by tannic acid-polyethyleneimine modified hollow fiber membrane with high-flux

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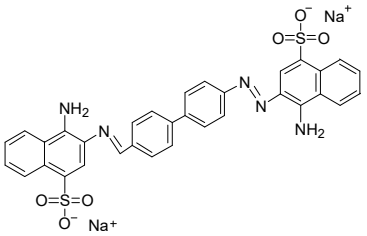
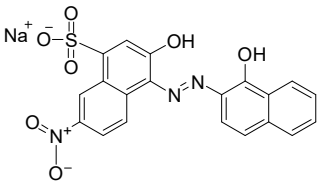
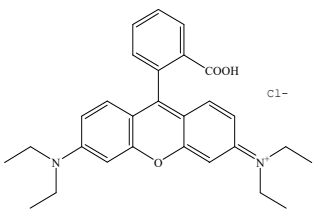
Table S1 Characteristics of dyes used in the study.

Dye	M_w (g/mol)	Charge	Molecular structure
Congo red (CR)	697	-2	
Eriochrome black T (EBT)	461	-1	
Rhodamine B (RhB)	479	+1	

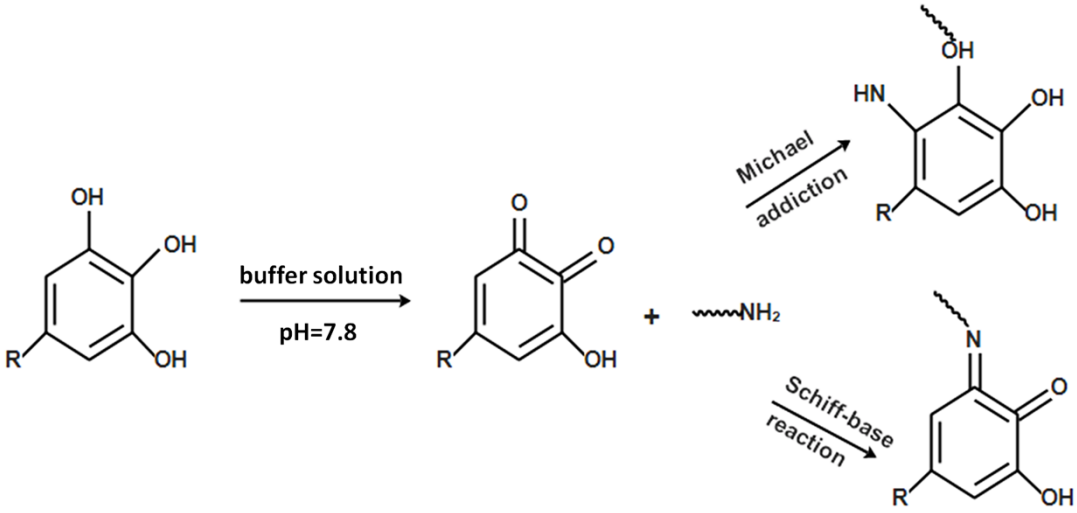


Figure S1. Reaction mechanism between TA and PEI.

TA contains phenolic groups located in the ortho position. Under weak alkaline conditions, catechol and pyrogallol phenolic substances are easily oxidized to form highly reactive quinone derivatives, which can react with primary amines through Schiff base reactions and Michael addition reactions. As shown in Figure S1, TA reacted with PEI via Michael addition/Schiff base reactions in alkaline buffer solution (pH = 7.8).

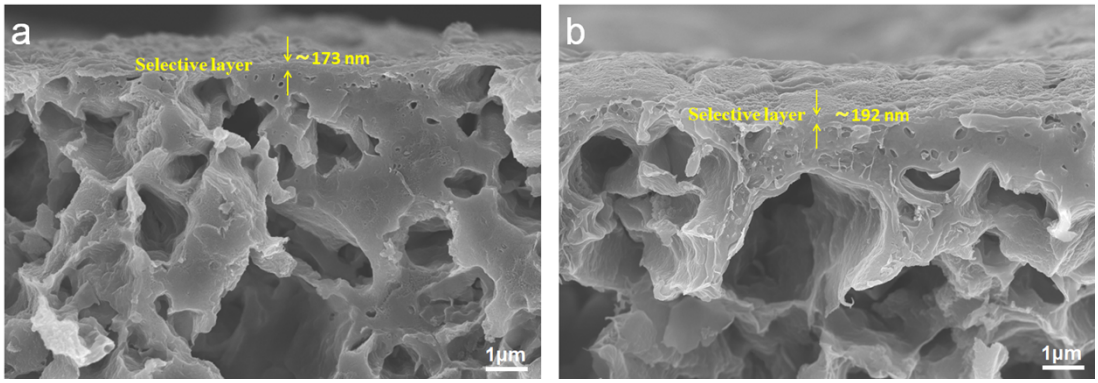


Figure S2. Enlarged cross-sections of the TA-PEI modified HFM prepared with different TA content: (a) 0.6 g/L and (b) 0.8 g/L

Table S2 The performance of the TA-PEI modified HFM for processing dye/NaCl mixtures.

Dyes/NaCl	Salt removal（%）	Dye removal（%）	Flux（L/m^2·h·bar）
CR/NaCl	5.8	99.0	31.0
EBT/NaCl	3.7	97.2	32.5
RhB/NaCl	1.2	95.0	28.5

CR/RhB/NaCl	3.0	96.7	29.1

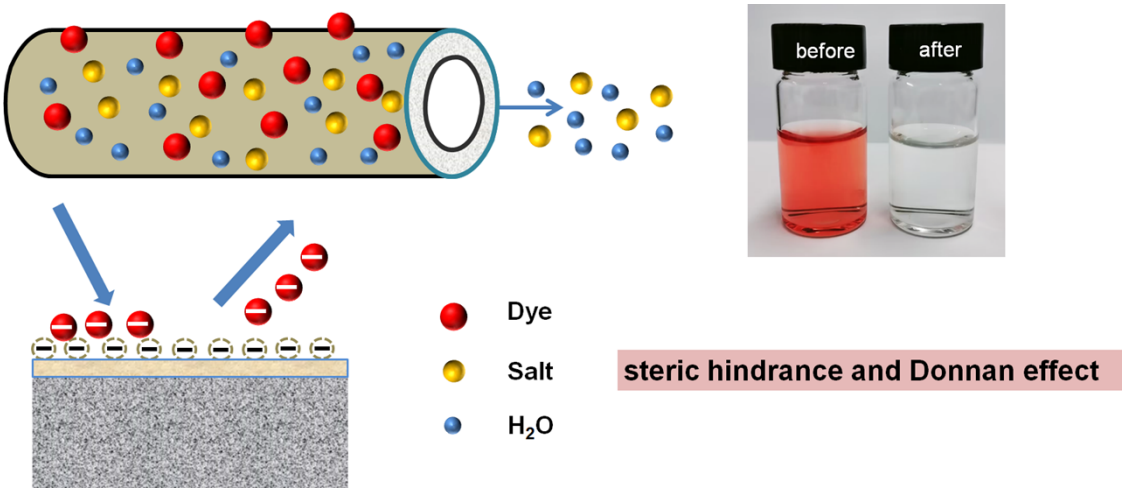


Figure S3. Schematic of dye/salt separation mechanism for TA-PEI modified HFM.

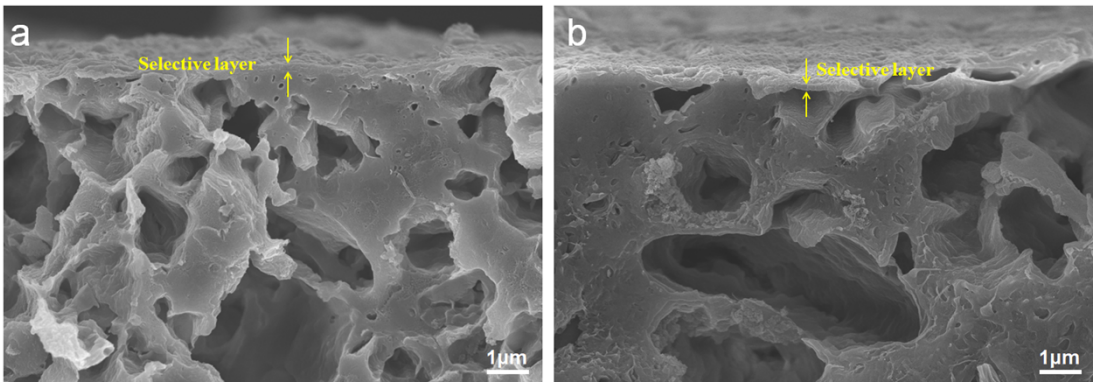


Figure S4. The morphological change of the TA-PEI modified membrane before (a) and after (b) long-term separation.

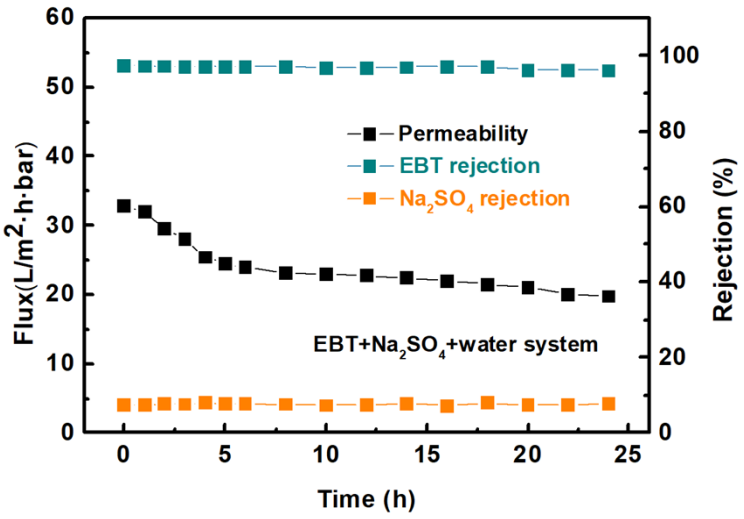


Figure S5. Stability of the TA-PEI modified membranes for processing aqueous EBT/Na_2SO_4 mixtures.

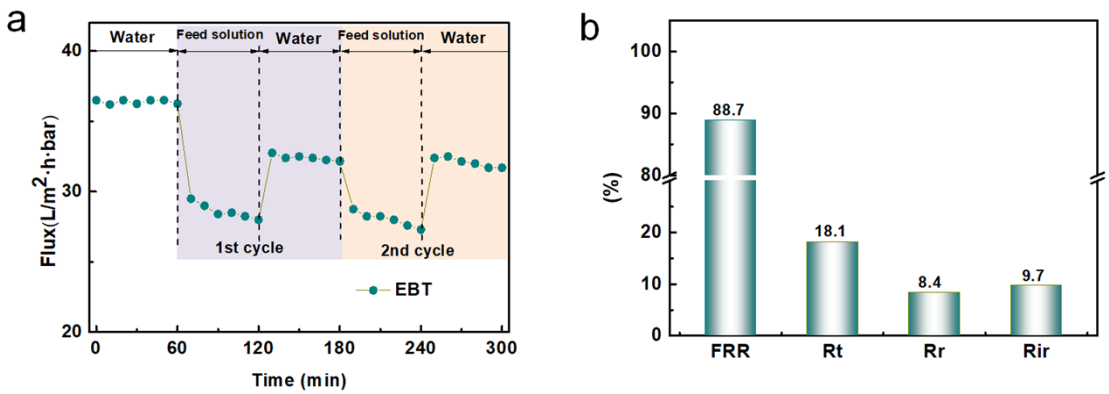


Figure S6. (a) Time-dependent flux of the TA-PEI modified HFM before and after the filtration of EBT solution and (b) the single values of Ft, FRR, Fir, and Fr of the modified HFM after two cycles of fouling and cleaning.