

## Supplementary Information

### **Enhancing H<sub>2</sub>O<sub>2</sub> tolerance and separation performance through the modification of the polyamide layer of a thin-film composite nanofiltration membrane by using graphene**

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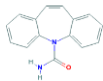
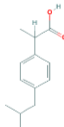
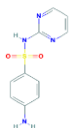
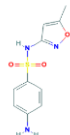
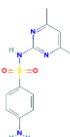
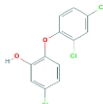
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This document consists of 4 pages including 2 Tables and 1 Figure.

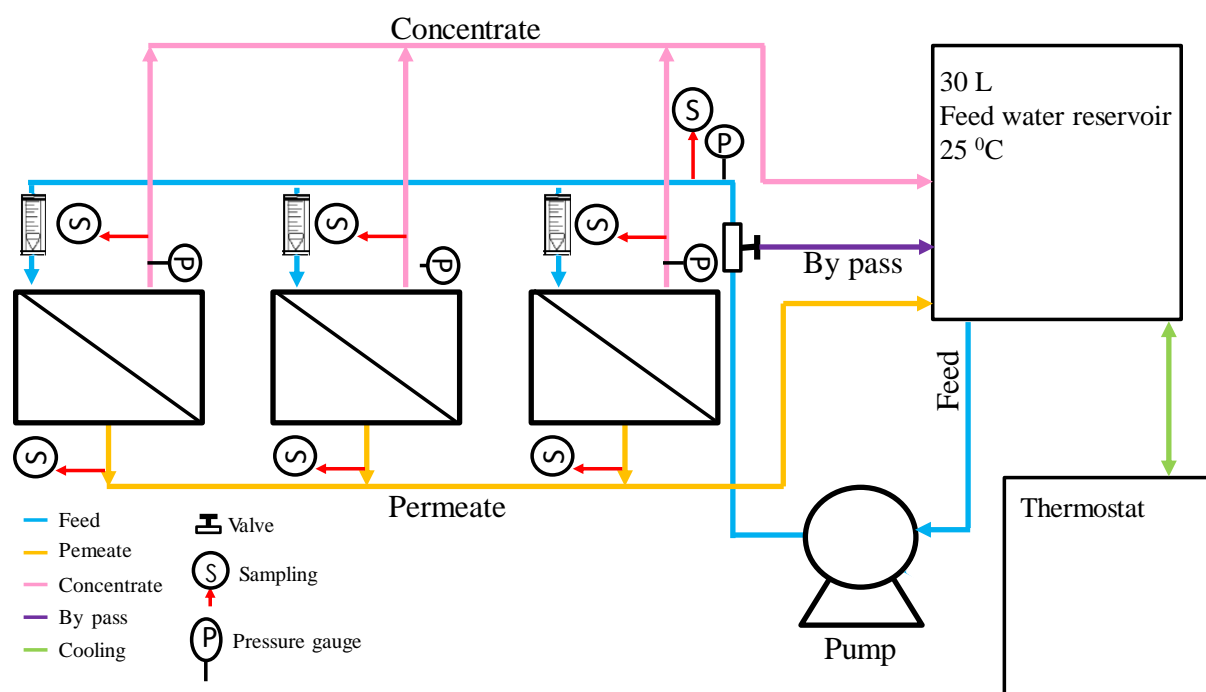
**Table S1** Physicochemical properties of the selected PPCPs in this study.

Name (Abbreviations)	Structure	Molecular formula	Molecular weight (g/mol)	Diffusion coefficient (10 <sup>-10</sup> m <sup>2</sup> /s) <sup>a</sup>	Stokes radius (nm) <sup>a</sup>	pK <sub>a</sub> <sup>b</sup>	logK <sub>ow</sub> <sup>c</sup>	Classif- ication <sup>d</sup>
Carbamazepine (CBZ)		C <sub>15</sub> H <sub>12</sub> N <sub>2</sub> O	236.3	5.81	0.422	13.9	2.45	HPO-N
Ibuprofen (IBU)		C <sub>13</sub> H <sub>18</sub> O <sub>2</sub>	206.3	5.95	0.412	4.3	3.14	HPO-I
Sulfadiazine (DIA)		C <sub>10</sub> H <sub>10</sub> N <sub>4</sub> O <sub>2</sub> S	250.3	6.11	0.401	6.4	0.21	HPI-I
Sulfamethoxazole (SMX)		C <sub>10</sub> H <sub>11</sub> N <sub>3</sub> O <sub>3</sub> S	253.3	6.08	0.403	5.7	0.86	HPI-I
Sulfamethazine (SMZ)		C <sub>12</sub> H <sub>14</sub> N <sub>4</sub> O <sub>2</sub> S	278.3	5.58	0.439	7.6	1.62	HPI-N
Triclosan (TRI)		C <sub>12</sub> H <sub>7</sub> Cl <sub>3</sub> O <sub>2</sub>	289.5	5.91	0.415	8.0	4.86	HPO-N

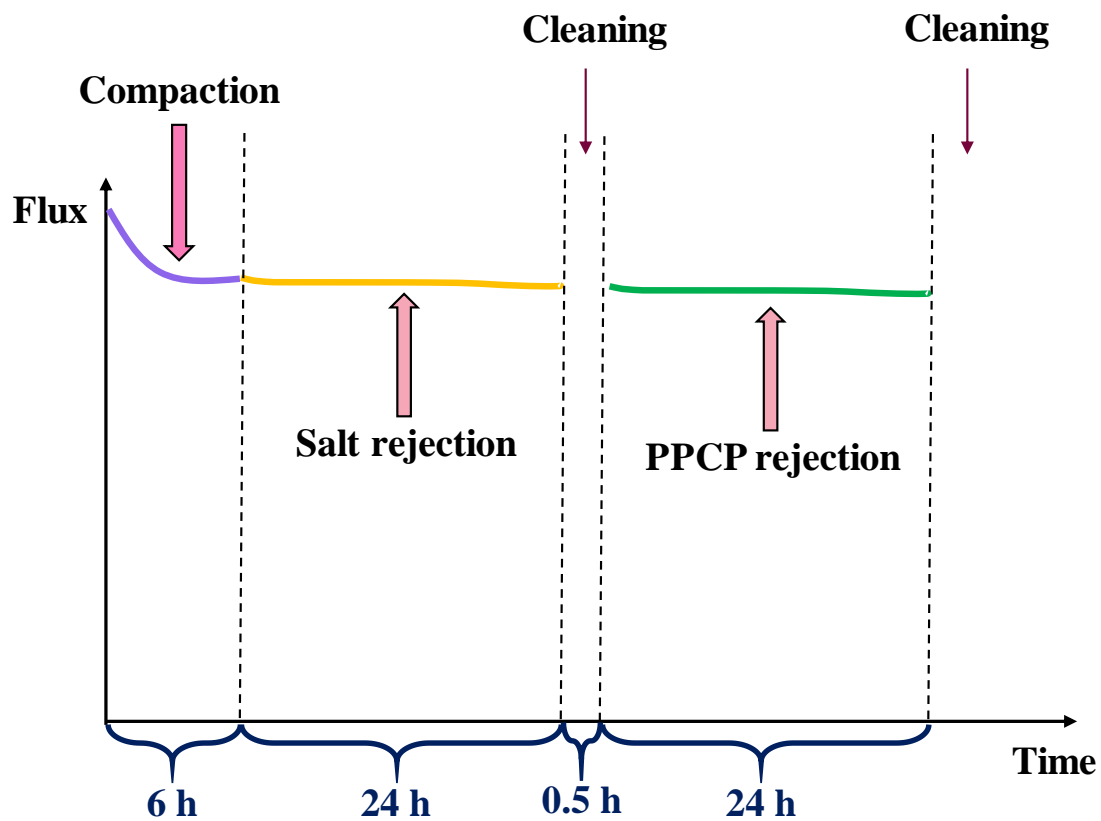
<sup>a</sup> Calculated from the method proposed by Wilke and Chang [1].<sup>b</sup> ADME/Tox Web Software.<sup>c</sup> Calculated using ChemOffice 2010.<sup>d</sup> HPI: hydrophilic (log K<sub>ow</sub> ≤ 2), HPO: hydrophobic (log K<sub>ow</sub> > 2), I: ionic (pK<sub>a</sub> ≤ 7), N: non-ionic (pK<sub>a</sub> > 7).

**Table S2** The parameters and the detailed specifications for the parallel rectangular cross-flow filtration system are given in the following:

No	Apparatus or instrument	Specification
1	Water bath	Model : Water Bath D-606, DENG YNG, Taiwan. Control the feed water temperature at $25 \pm 0.5$ °C.
2	Feedwater reservoir	30 L, polyethylene (PE), Taiwan.
	Cross-flow filtration module	A self-designed, cross-flow mode filtration apparatus with a flat-sheet membrane cell. All parts of the experimental apparatus were made of stainless steel. The effective membrane area : $137.75 \text{ cm}^2$ .
3	Pressure gauge	Operating condition : $6.9 \text{ kg/cm}^2$ (100 psi).
4	Flow meter	Operating condition: 1.14 L/min.
5	Pressure regulation valve	1/4" Stainless steel 316.



**Figure S1** The schematic diagram of the cross-flow filtration system.



**Figure S2** The schematic variation of permeate flux with filtration time.

## References

- [1] C.R. Wilke, P. Chang, Correlation of diffusion coefficients in dilute solutions, *AIChE Journal*, 1 (1955) 264-270.