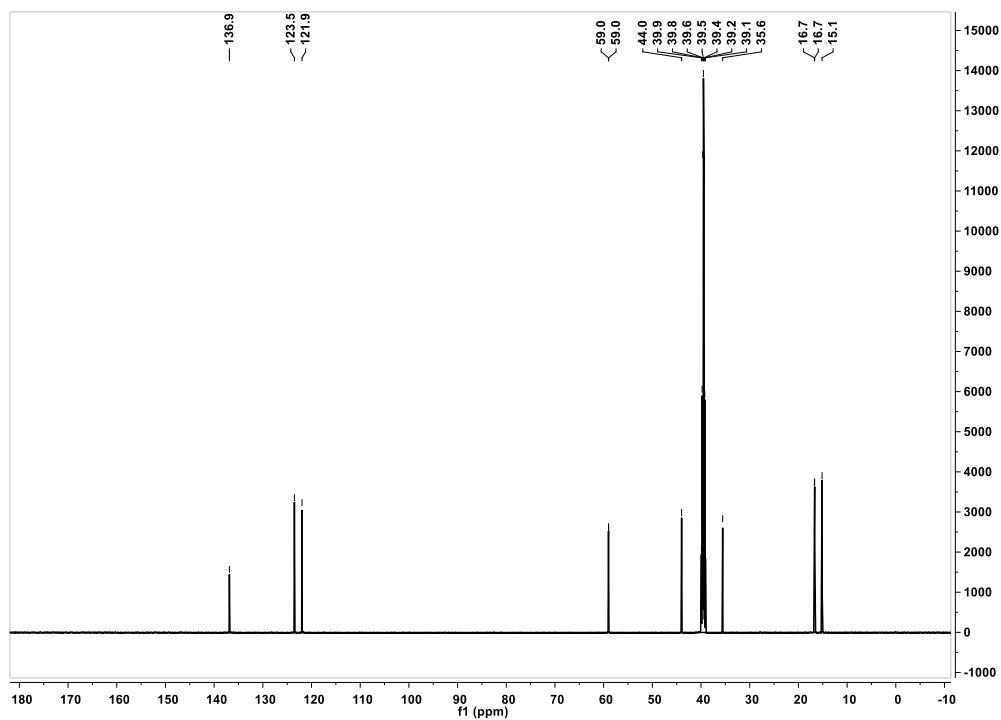


**Figure S1. The <sup>1</sup>H NMR data of the synthesized [Emim]Dep IL.**

(d<sub>6</sub>-DMSO with 0.03% v/v TMS, 600MHz): δ 1.07[t, 6H, J=7.1 Hz], 1.42[t, 3H, J=7.3 Hz], 3.62[p, 4H, J=7.0 Hz], 3.87[s, 3H], 4.22[q, 2H, J=7.3 Hz], 7.76[t, 1H, J=1.6 Hz], 7.85[t, 1H, J=1.7 Hz], 9.56[s, 1H].



**Figure S2. The <sup>13</sup>C NMR data of the synthesized [Emim]Dep IL.**  
(d6-DMSO with 0.03% v/v TMS, 151MHz): δ 15.1, 16.7, 35.6, 44.0, 59.0, 121.9, 123.5, 136.9.

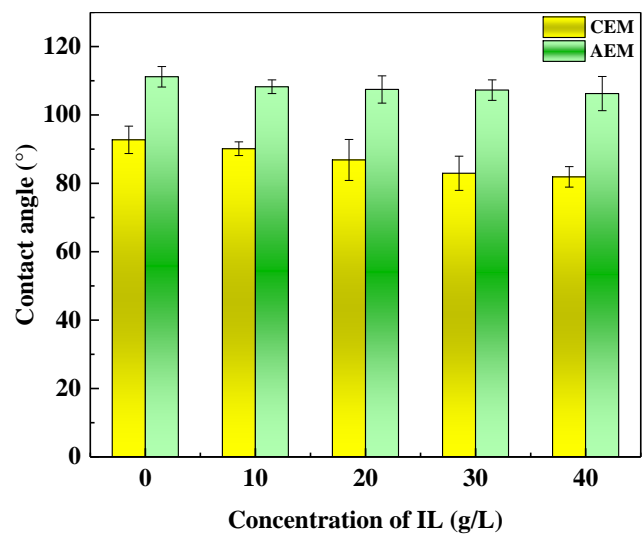
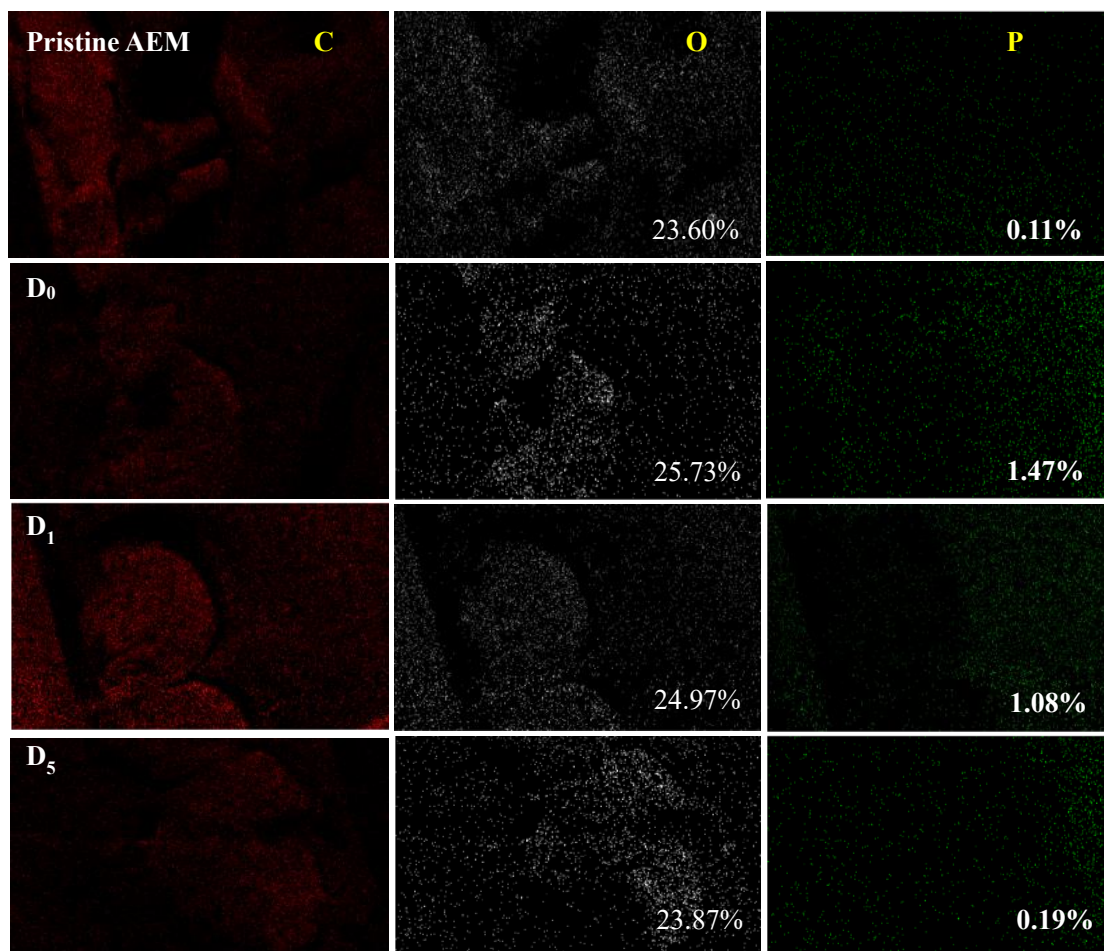


Figure S3. Contact angles of CEMs and AEMs at different IL concentrations.



**Figure S4.** The element mapping on the cross-section for the pristine and fouled AEMs.

**Table S1. IECs of the fouled membranes at different IL concentrations.**

IL concentration (g/L)	IEC (mol/kg)	
	CEM	AEM
0	0.8663	0.5721
10	0.5720	0.4905
20	0.5571	0.4744
30	0.5465	0.4632
40	0.5339	0.4497

**Table S2. IECs of the fouled membranes at different temperatures.**

Temperature (°C)	IEC (mol/kg)	
	CEM	AEM
25	0.5370	0.4565
30	0.5031	0.4198
35	0.4602	0.3765
40	0.4171	0.3172

**Table S3. IECs of the fouled membranes immersed in the HCl solution for different time.**

Immersing time (d)	IEC (mol/kg)	
	CEM	AEM
0	0.5370	0.4565
1	0.8260	0.4769
2	0.8231	0.4972
3	0.8220	0.5345
4	0.8223	0.5621
5	0.8193	0.5678