

Supplementary Information

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3 **Correlation between the feed composition and membrane wetting in a direct** 4 **contact membrane distillation process**

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23 **Table S1. Operation time until distillate conductivity reached 50 μ S/cm**

Feed solutions	Additional compounds to the background solution	Time [d]
Background solution*	-	1.60
	-	1.52
Inorganics in the background solution	CaCl ₂ 1000 ppm + MgSO ₄ 1000 ppm	1.14
	CaCl ₂ 2000 ppm + MgSO ₄ 2000 ppm	0.96
	CaCl ₂ 4000 ppm + MgSO ₄ 4000 ppm	0.75
Organics in the background solution	HA 50 mg C/L	-**
	HA 100 mg C/L	-**
	O-HA (1 h) 50 mg C/L	0.94
	O-HA (1 h) 100 mg C/L	0.47
	O-HA (2 h) 50 mg C/L	0.66
	O-HA (2 h) 100 mg C/L	0.47
	O-HA (3 h) 50 mg C/L	0.29
	O-HA (3 h) 100 mg C/L	0.27

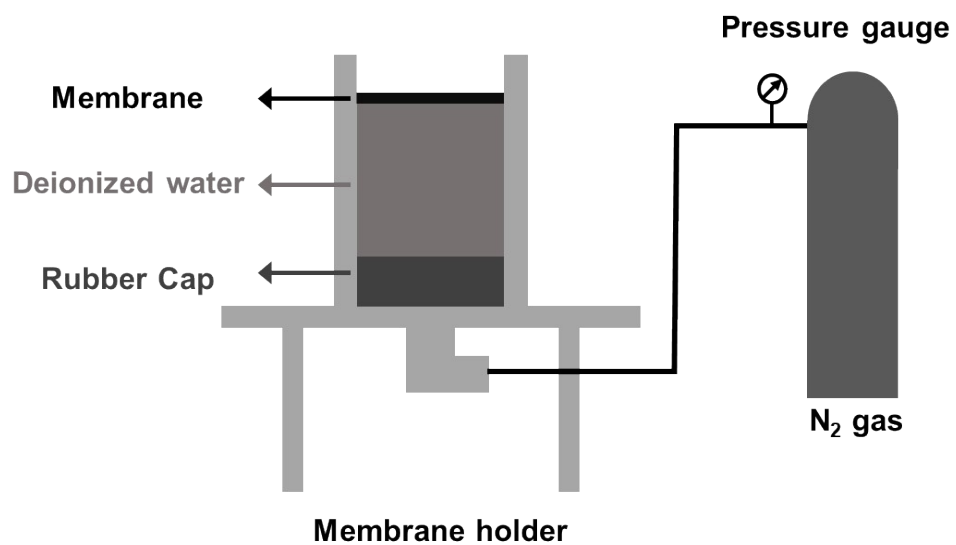
24 * The background solution consisted of 50,000 ppm NaCl, 200 ppm NaHCO₃, and 10 ppm SDS.

25 ** Distillate conductivity did not reach 50 μ S/cm until operation was ceased in 2 days.

26 **Table S2. Turbidity of the feed solutions containing CaCl₂ and MgSO₄**

	Additional compounds to the background solution*	Turbidity [NTU]
	CaCl ₂ 1000 ppm + MgSO ₄ 1000 ppm	15.1
Feed solutions	CaCl ₂ 2000 ppm + MgSO ₄ 2000 ppm	44.7
	CaCl ₂ 4000 ppm + MgSO ₄ 4000 ppm	71.6

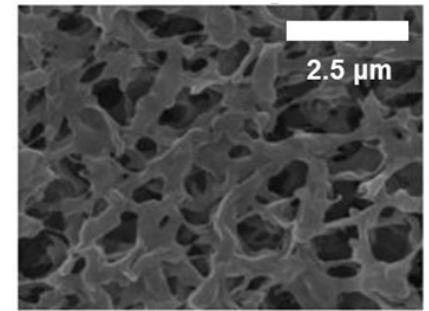
27 * The background solution consisted of 50,000 ppm NaCl, 200 ppm NaHCO₃, and 10 ppm SDS.



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29 **Figure S1. Schematic diagram of the device used for the LEP measurements.**

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Element	K ratio	wt%
C	0.39944	71.07
F	0.11773	28.93
Total		100.00

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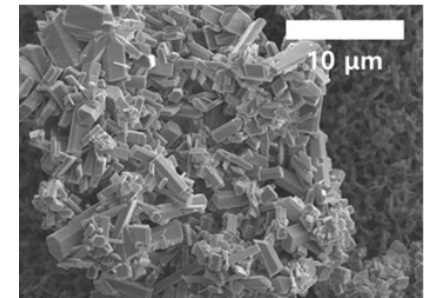
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(a)

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Element	K ratio	wt%
O	0.00301	32.65
Na	0.00018	0.58
Mg	0.00001	0.03
S	0.00012	0.21
Cl	0.00115	1.98
Ca	0.03895	64.56
Total		100.01

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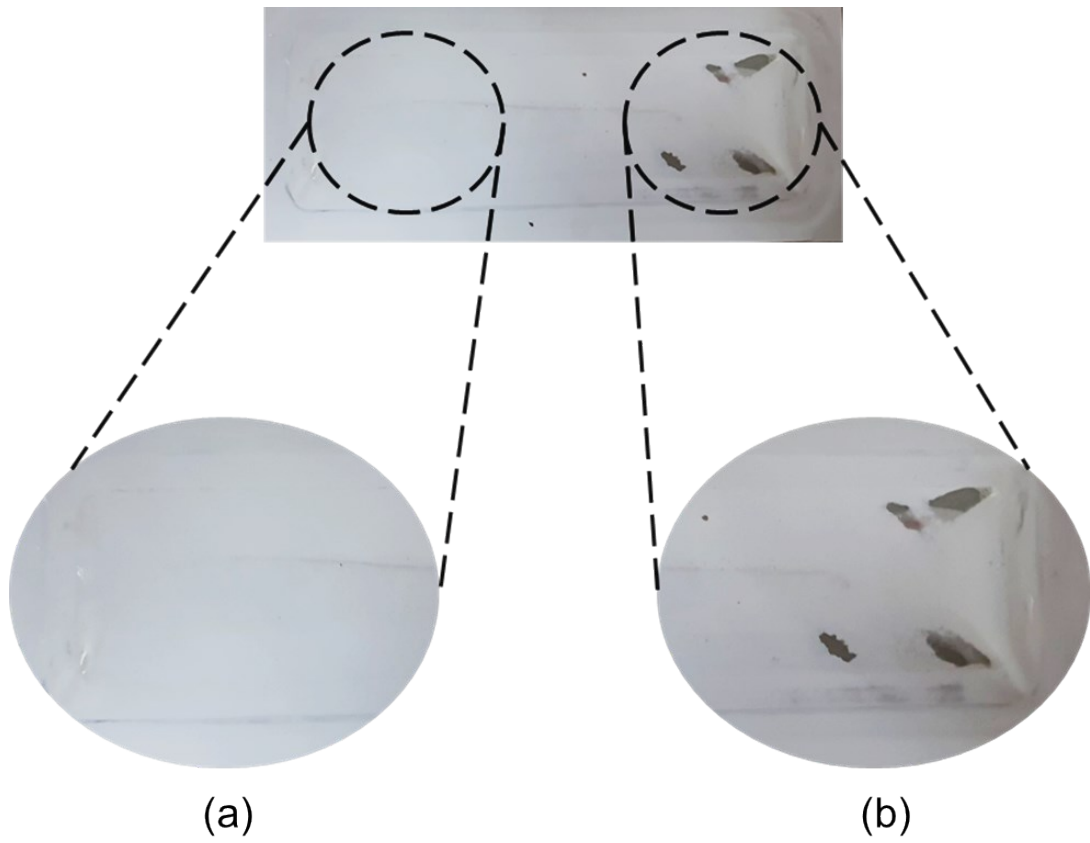
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(b)

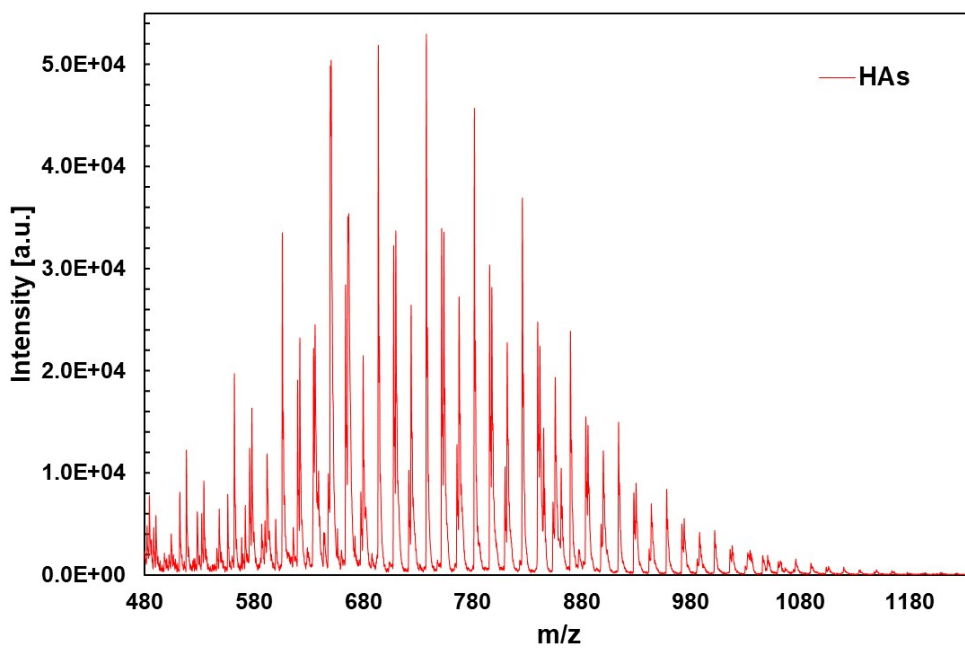
45 **Figure S2. SEM-EDX data of (a) a virgin membrane and (b) the distillate-side wetted**
46 **surface of the membrane sampled after operation with the feed solution containing both**
47 **2000 ppm CaCl₂ and 2000 ppm MgSO₄.**



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50 **Figure S3. Images of the distillate side of the membrane taken after the occurrence of**
51 **membrane wetting during the MD operation with the feed solution containing both 1000**
52 **ppm CaCl_2 and 1000 ppm MgSO_4 in the background solution: (a) non-wetted surface and**
53 **(b) wetted surface.**

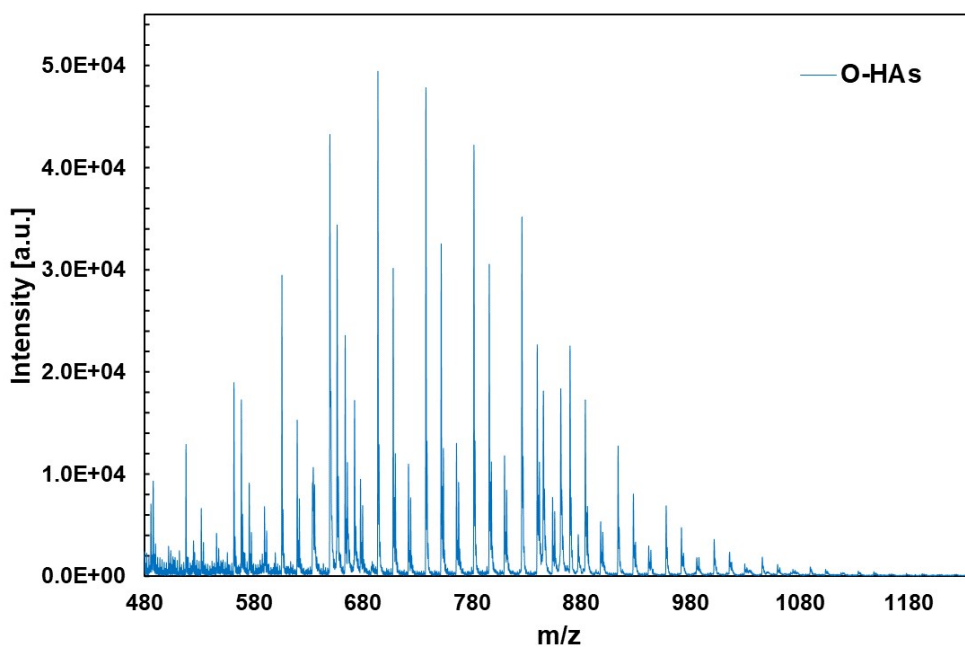
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(a)



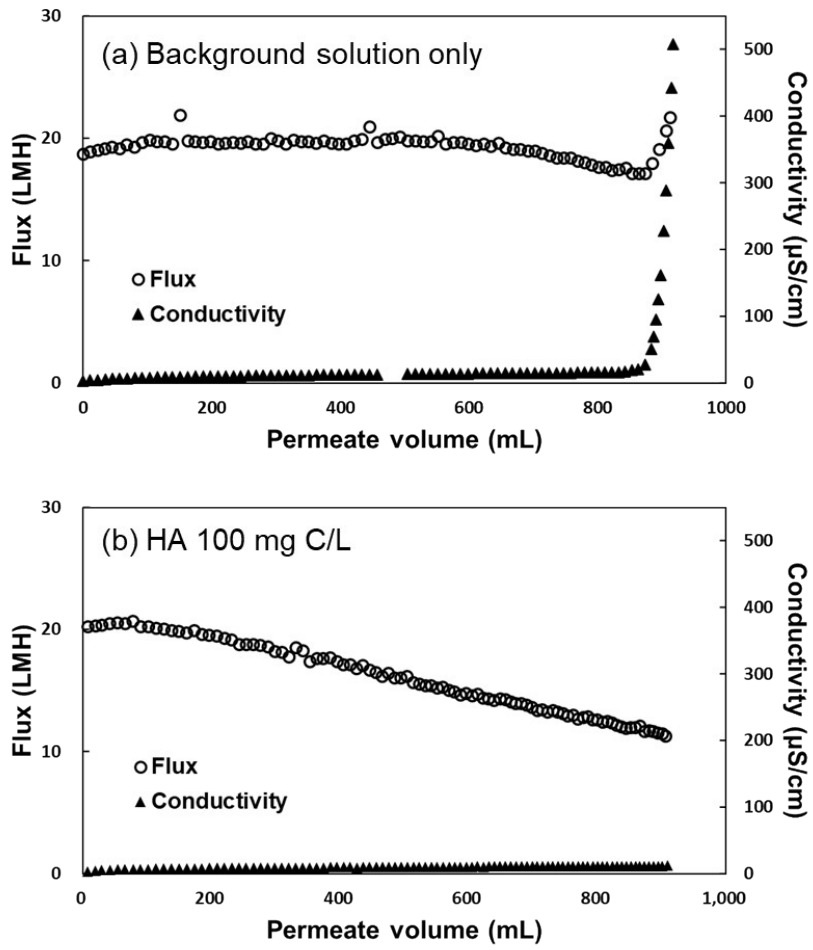
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(b)

59 **Figure S4. MALDI-TOF data of (a) HAs and (b) O-HAs ozonated for 2 h.**

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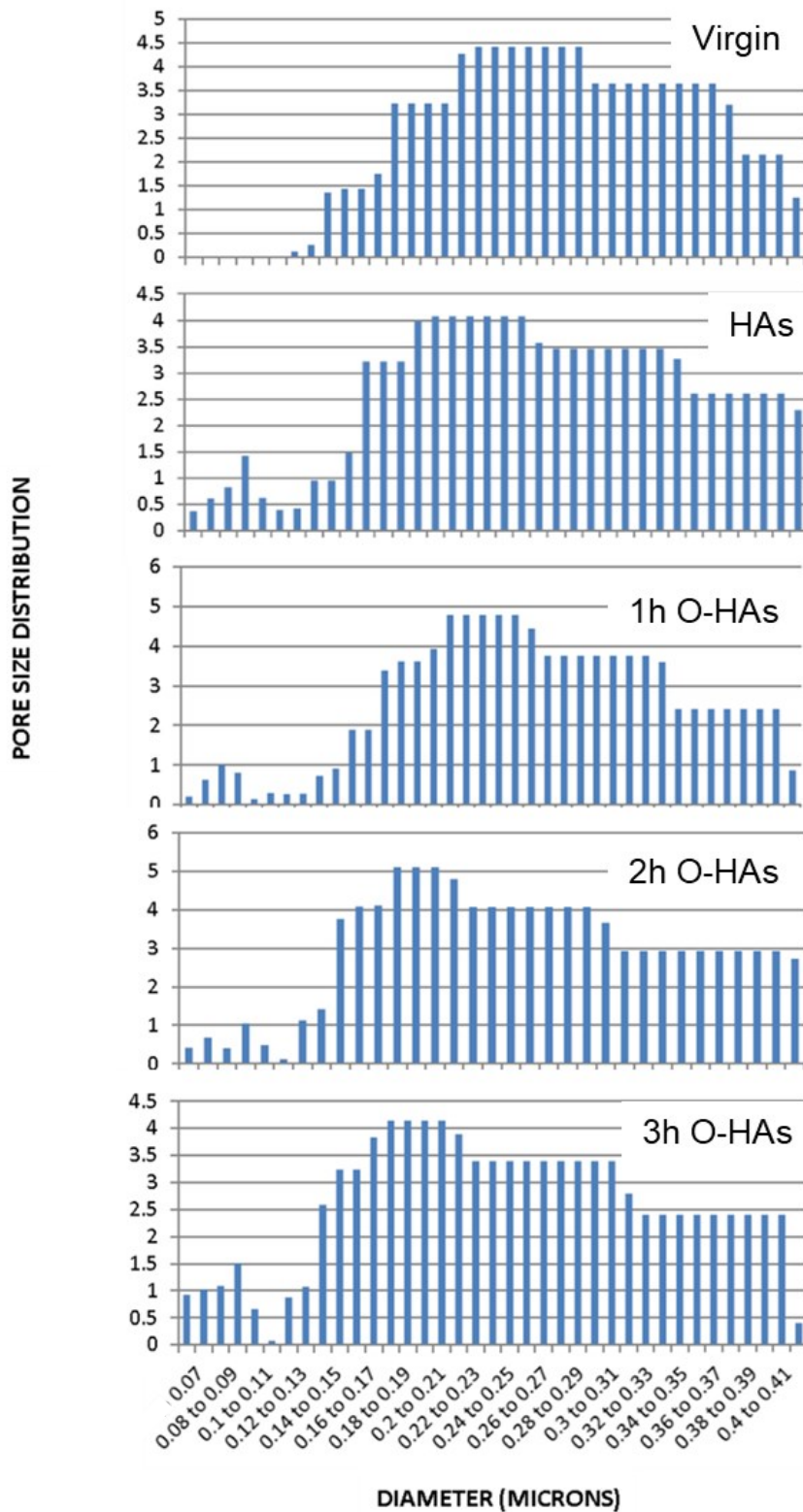


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62 **Figure S5. Distillate flux and conductivity during the MD operation with (a) background**
 63 **solution and (b) the feed solution containing 100 mg C/L of HAs.**

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67 **Figure S6. Pore size distribution of virgin membrane and the membranes sampled after**

68 **the MD operation with the feed solutions containing 100 mg C/L of HAs or O-HAs.**