

Supplementary Information

Microstructural Optimization of MFI-type Zeolite Membrane for Ethanol-Water Separation

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Table S1. Effects of TPAOH content and crystallization time on the PV performance of MFI zeolite membranes^a

Membrane No.	TPAOH content (x)	Time (h)	Flux (kg m ⁻² h ⁻¹)	Separation factor (-)
MS1	0.17	8	1.62	65
MS2	0.17	12	1.66	63
MS3	0.10	8	1.75	66
MS4	0.05	8	1.80	59

^a Molar composition of the synthesis solution: xTPAOH : 1TEOS : 165H₂O.

Table S2. Effects of OH⁻/Si ratio on the PV performance of MFI-type zeolite membranes when the TPA⁺/Si ratio is fixed at 0.05^a

Membrane No.	NaOH content (y)	OH ⁻ /Si	Flux (kg m ⁻² h ⁻¹)	Separation factor (-)
M7	0	0.05	1.96	55
M9	0.05	0.10	1.57	77
M15	0.12	0.17	1.09	77
M16	0.27	0.32	0.59	66

^a Molar composition of the synthesis solution: 0.05TPAOH : 1TEOS : 165H₂O : yNaOH, synthesis time: 4 h.

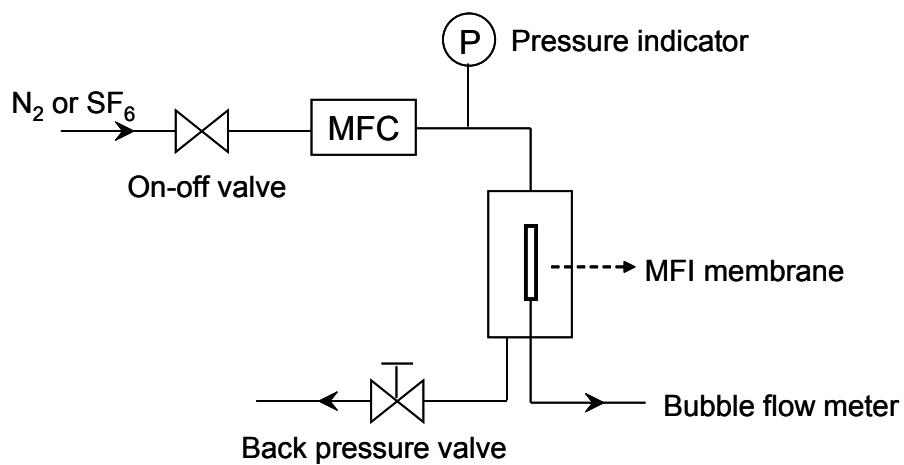


Fig. S1 Diagram of gas permeation setup.

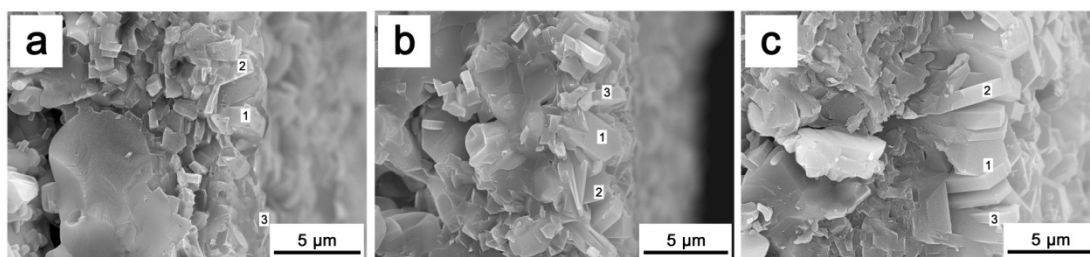


Fig. S2 Measure points of EDX analysis of membranes M2 (a), M5 (b), and M6 (c).

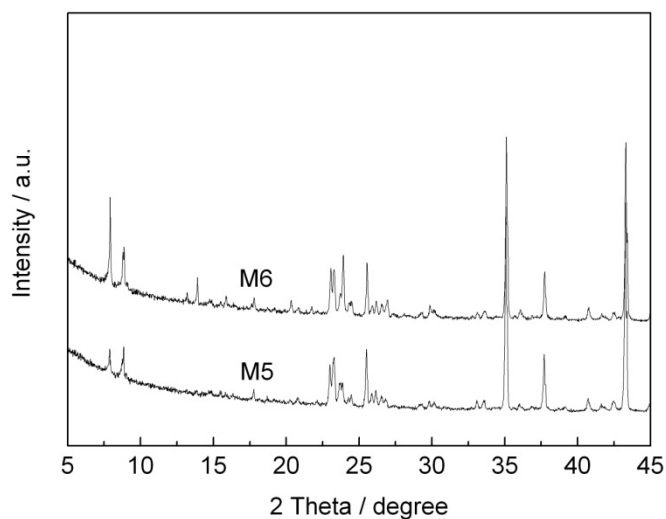


Fig. S3 XRD patterns of membranes M5 and M6.

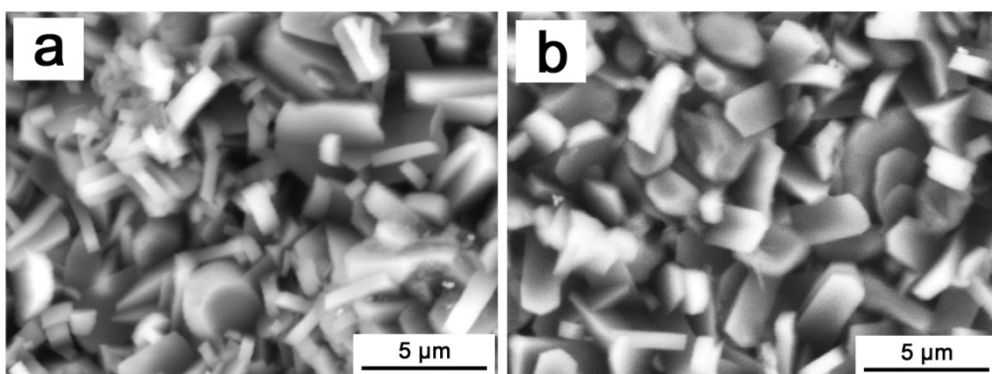


Fig. S4 SEM top-view images of the membrane synthesized at 175 °C for 2 h when the ratio of TPA⁺/Si is 0.17 (a) and 0.05 (b).