

Electronic Supplementary Information

Propylene/Propane Selective Mixed Matrix Membranes with Grape-Branched MOFs/CNTs Filler

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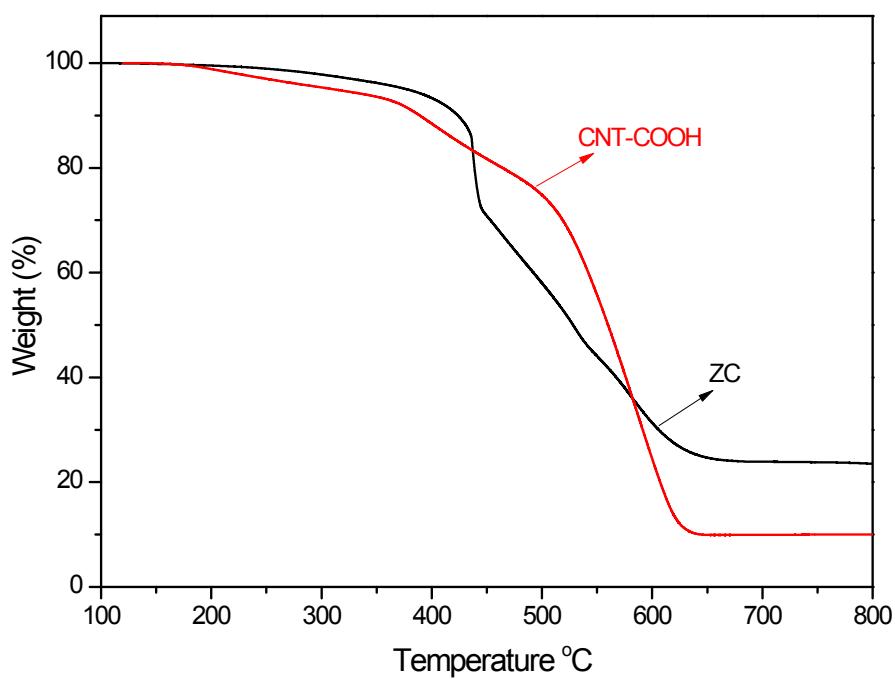


Fig. S1 TGA curve of CNT-COOH and ZC under air atmosphere

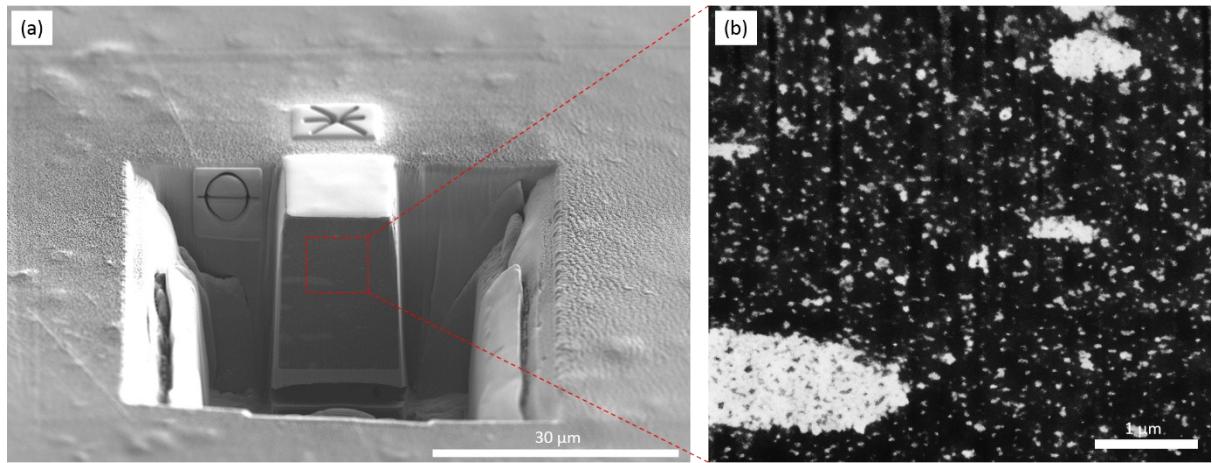


Fig. S2 Typical FIB-SEM images of 15 wt% ZIF-8/6FDA-durene MMM (a) FIB milling hole (b) cross-sectional image in the BSE mode

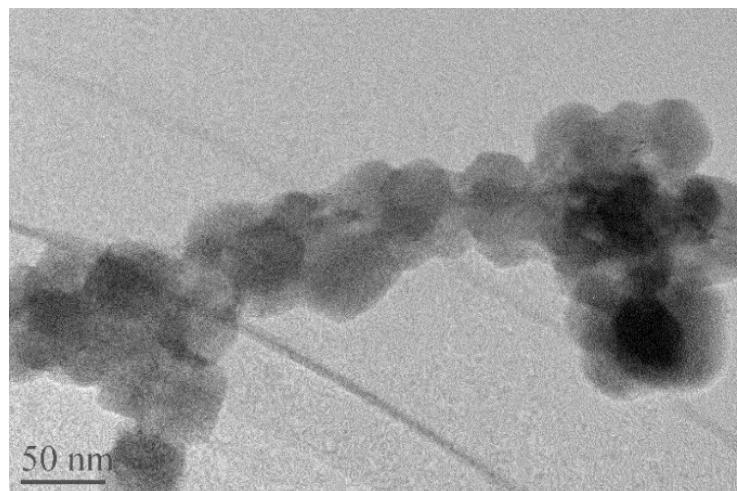


Fig. S3 TEM image of ZC

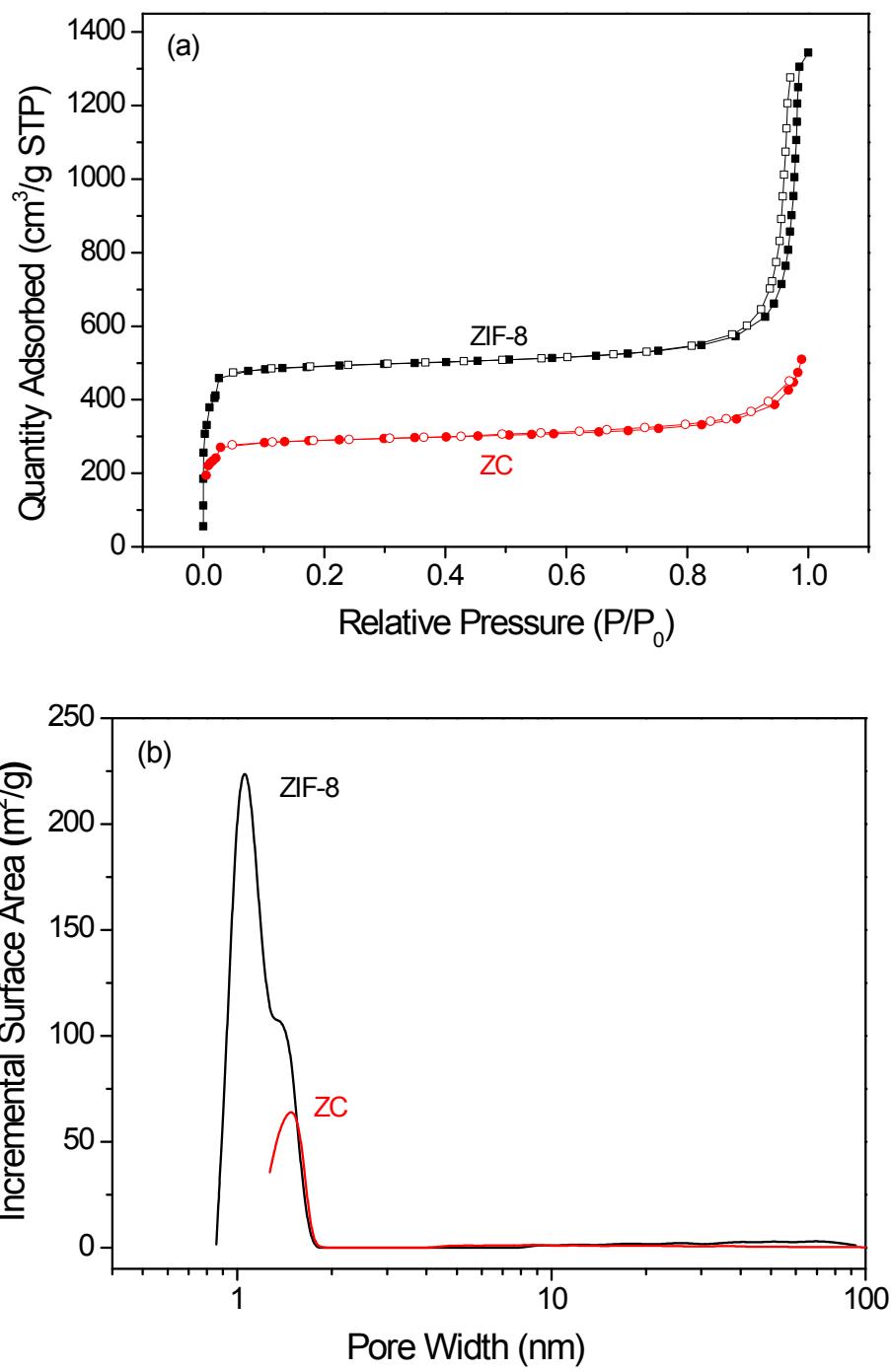


Fig. S4 (a) N₂ adsorption/desorption isotherms of ZIF-8 and ZC at 77 K (solid symbols = adsorption; empty symbols = desorption); (b) pore size distribution of ZIF-8 and ZC

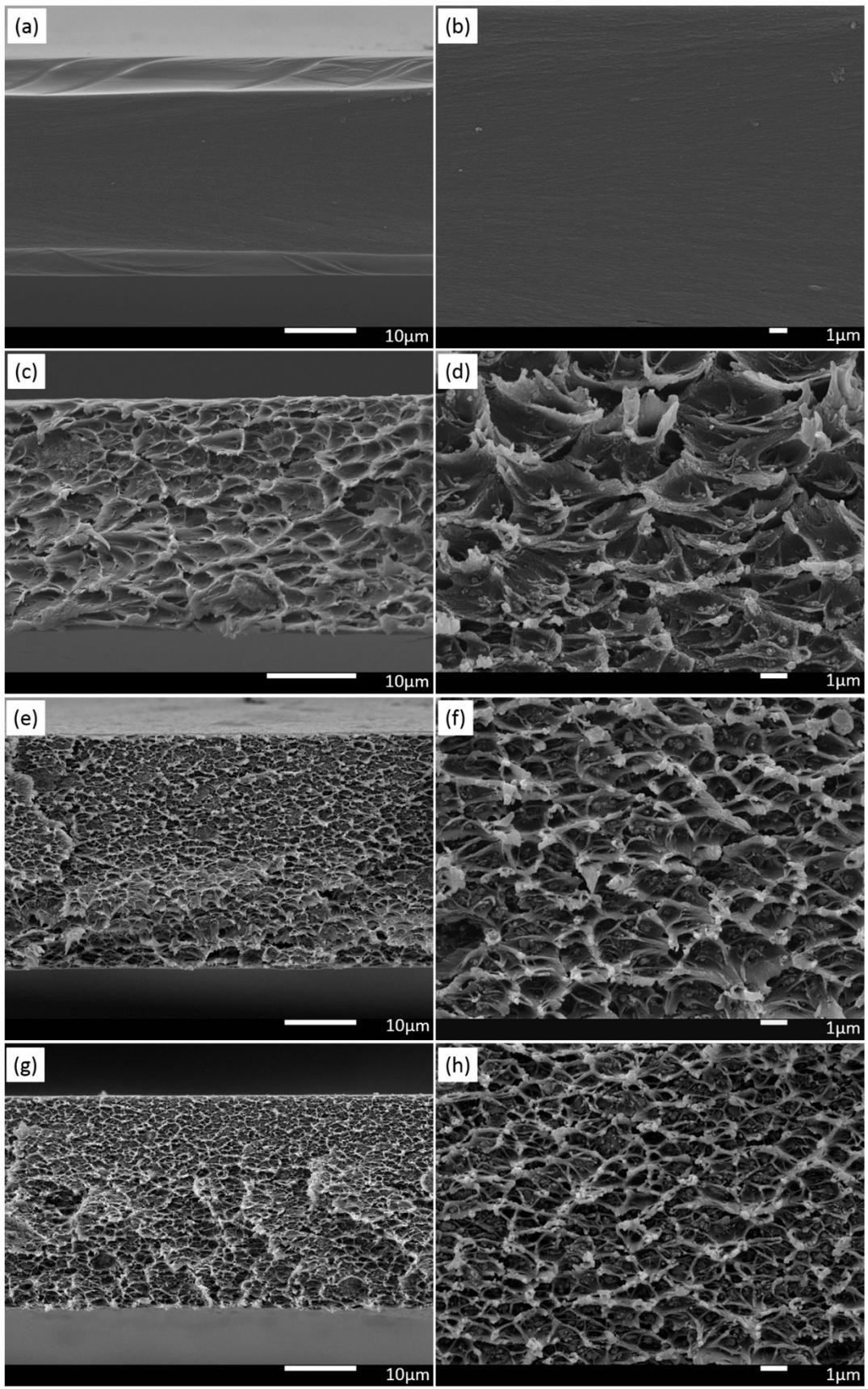


Fig. S5 SEM images of pure 6FDA-durene (a, b) and ZC/6FDA-durene MMMs cross-sections with different amount of ZC (c, d: 5wt%; e, f: 10wt%; g, h: 15wt%)

Table S1 Gas permeability and selectivity of 15 wt% ZIF-8/6FDA-durene MMM
 (25 °C, 2 atm feed gas pressure)

Sample	Permeability (Barrer)		Selectivity C_3H_6/C_3H_8
	C_3H_6	C_3H_8	
15 wt% ZIF-8/6FDA-durene MMM	120.4 ± 4.87	9.66 ± 1.25	12.46

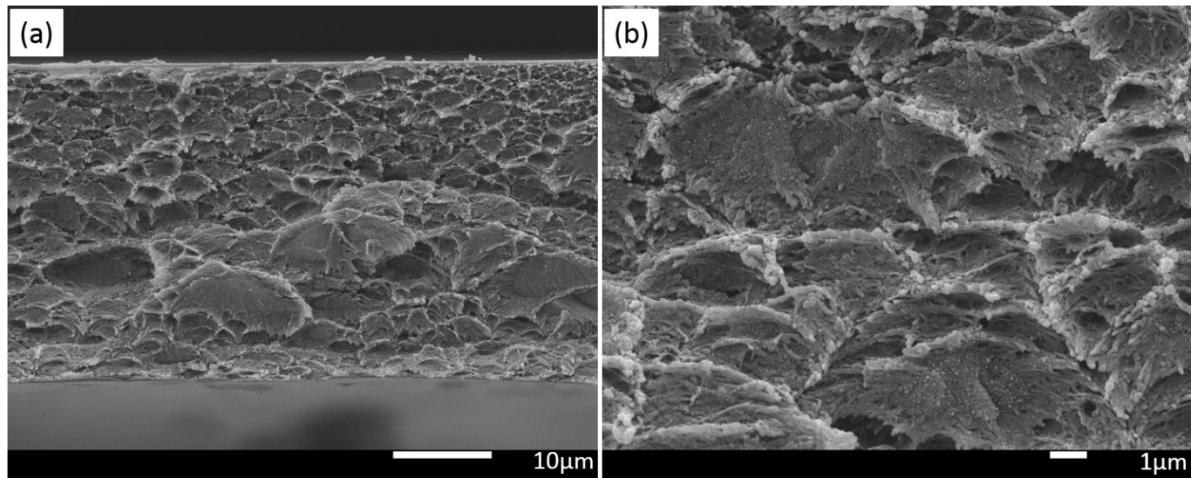


Fig. S6 Cross-section SEM images of 15 wt% ZIF-8/6FDA-durene MMM
 (a: low magnification; b: high magnification)

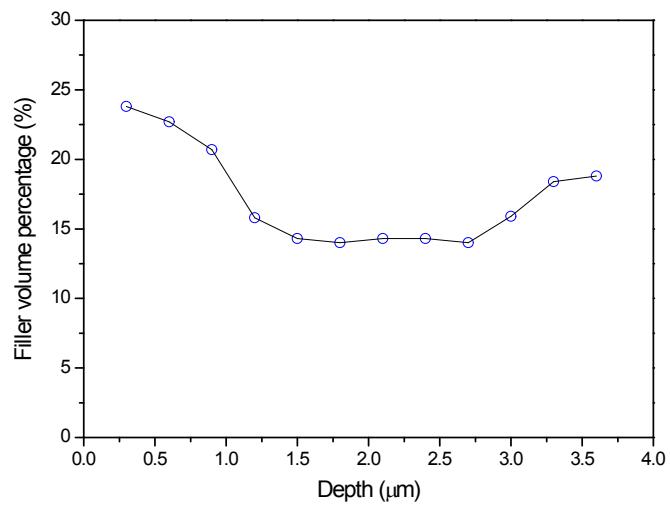


Fig. S7 Filler volume variation in different depth of 15 wt% ZIF-8/6FDA-durene MMM

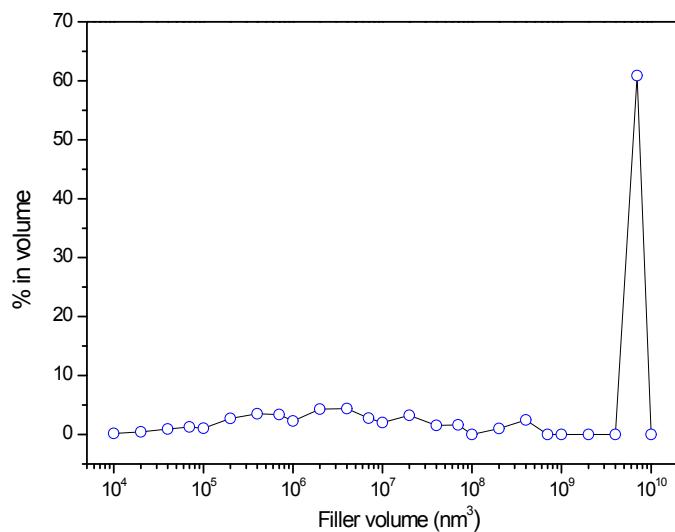


Fig. S8 Filler particle size distribution in 15 wt% ZIF-8/6FDA-durene MMM derived from image analysis of the FIB-SEM tomogram