Polymer-MOF Hybrid Composites with High Porosity and Stability through Surface-Selective Ligand Exchange

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Supporting Information
Contents

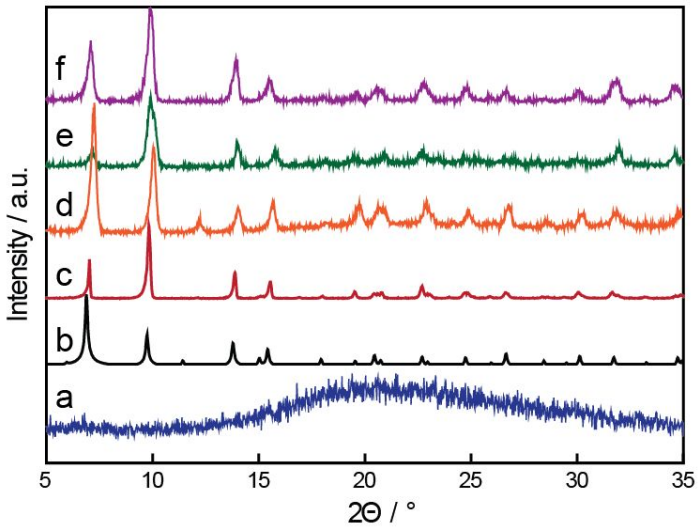

Figure S1. PXRD diffractograms of PAA (a), MOF-5 simulated (b, CCDC no. 256965[1]), microcrystalline MOF-5 experimental (c), nanocrystalline MOF-5 experimental (d) **MOF-5/PAA** (e) and **MOF-5/PI** (f)

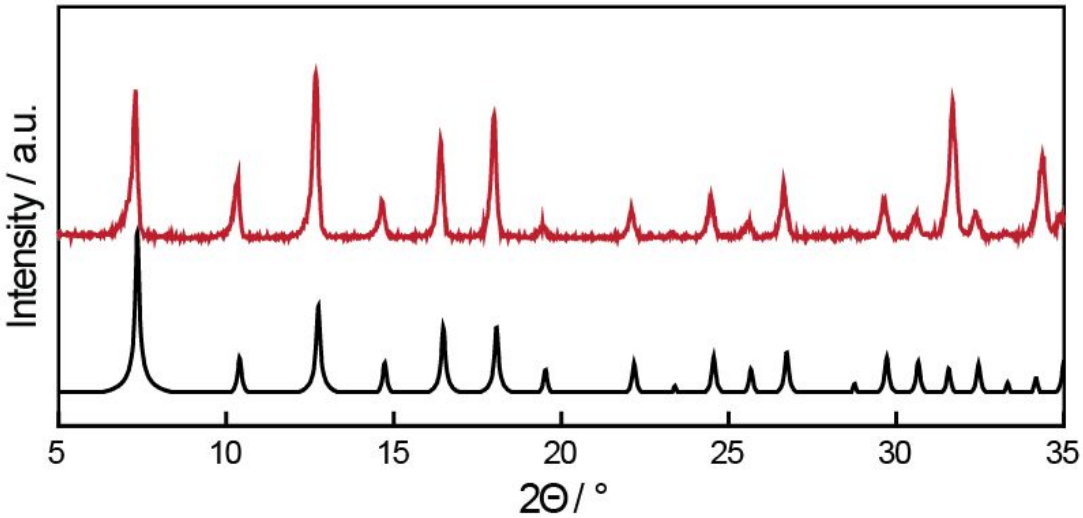

Figure S2. PXRD diffractograms of ZIF-8 simulated (bottom, CCDC no. 602542[2]) and experimental (top)

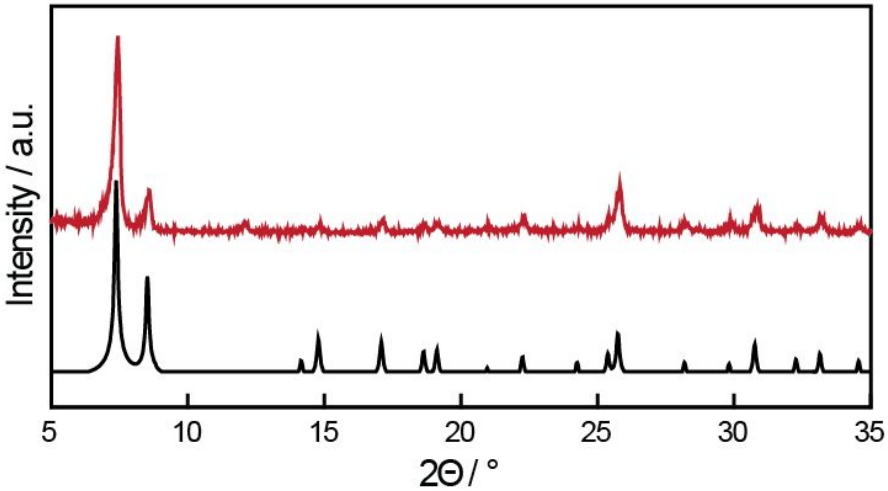

Figure S3. PXRD diffractograms of UiO-66 simulated (bottom, CCDC no. 733458[3]) and experimental (top)

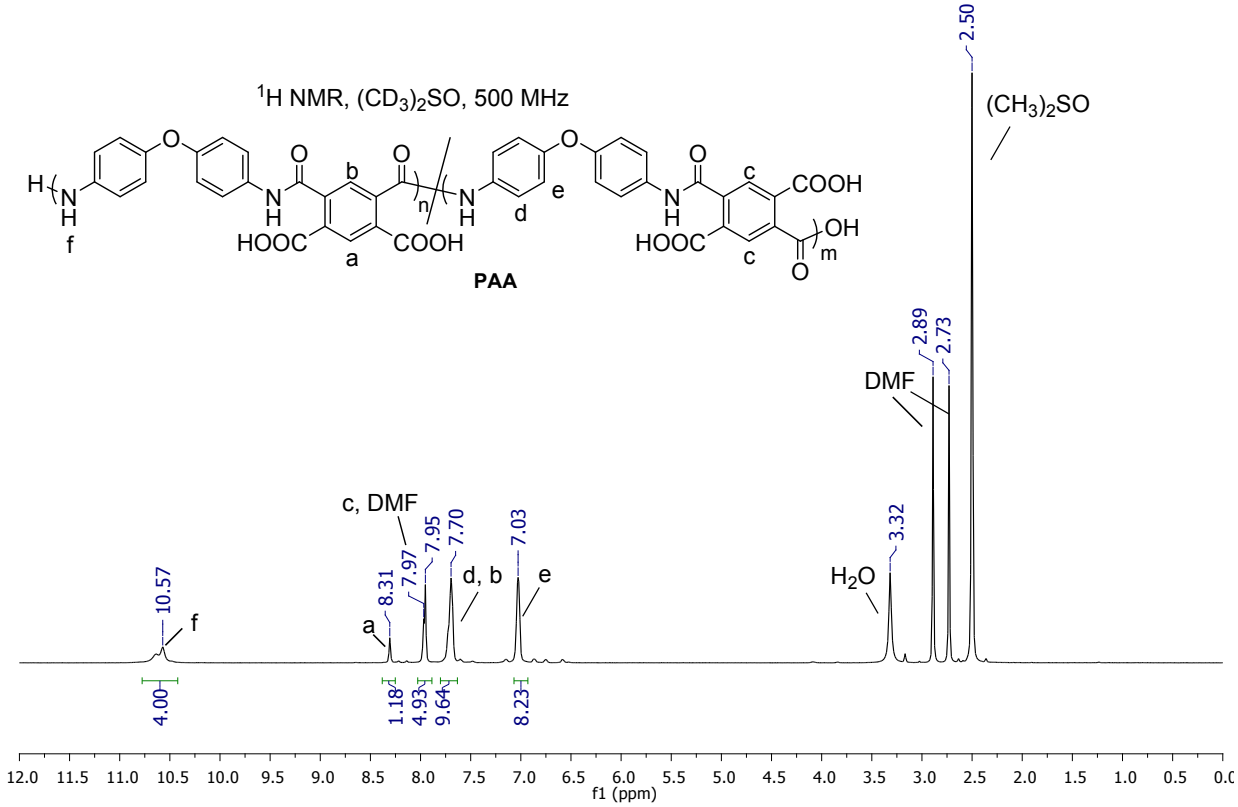

Figure S4. ^{1}H NMR spectrum of **PAA**

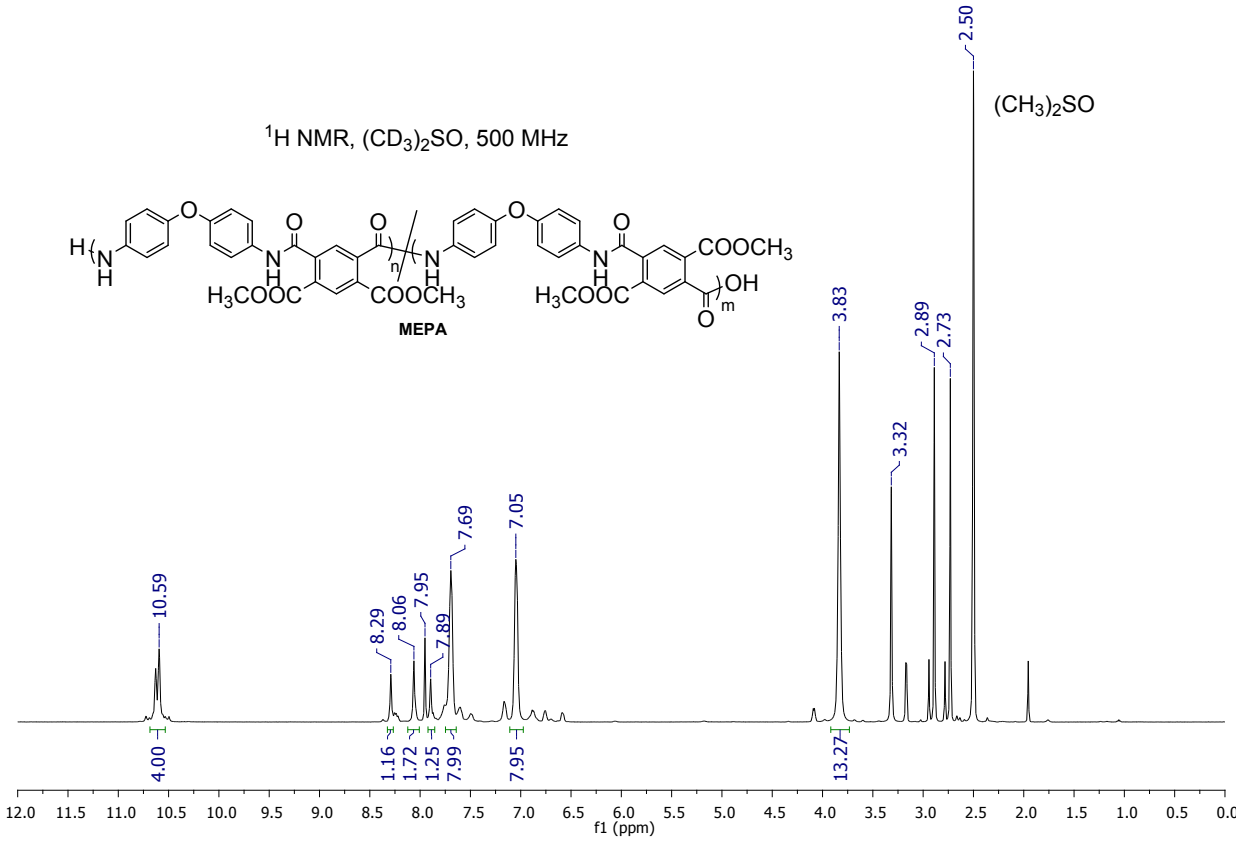

Figure S5. ^{1}H NMR spectrum of **MEPA**

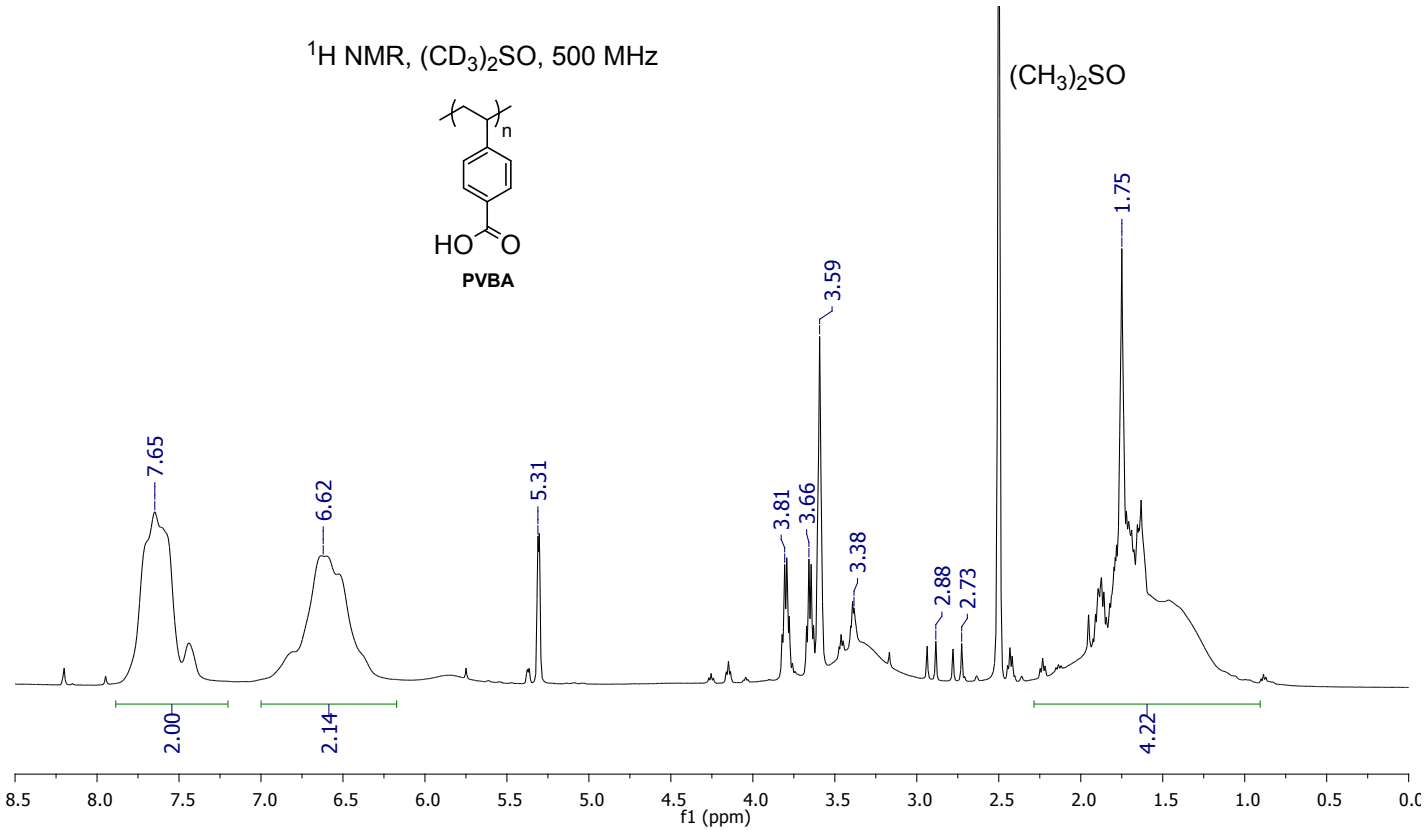

Figure S6. ^{1}H NMR spectrum of **PVBA**

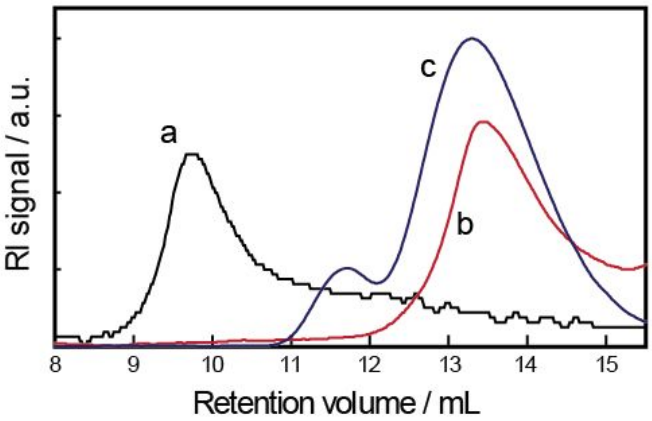

Figure S7. GPC traces of **PAA** high (a), **PAA** low (b), and **MEPA** (c)

Table S1. Polymer molecular weight information[a]

Polymer	M_n / Da	M_w / Da	M_w/M_n
PAA high	239,500	500,500	2.09
PAA low	4,600	7,500	1.63
MEPA	5,500	15,000	2.73

[a]Molecular weights and distributions were obtained from GPC relative to linear PEO calibration.

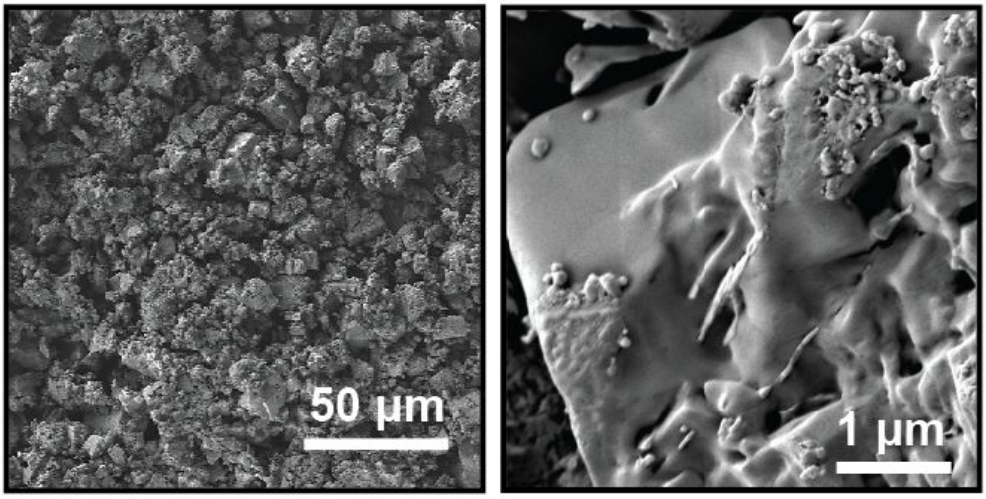

Figure S8. SEM images of polymer-coated MOF-5 isolated prior to crosslinking

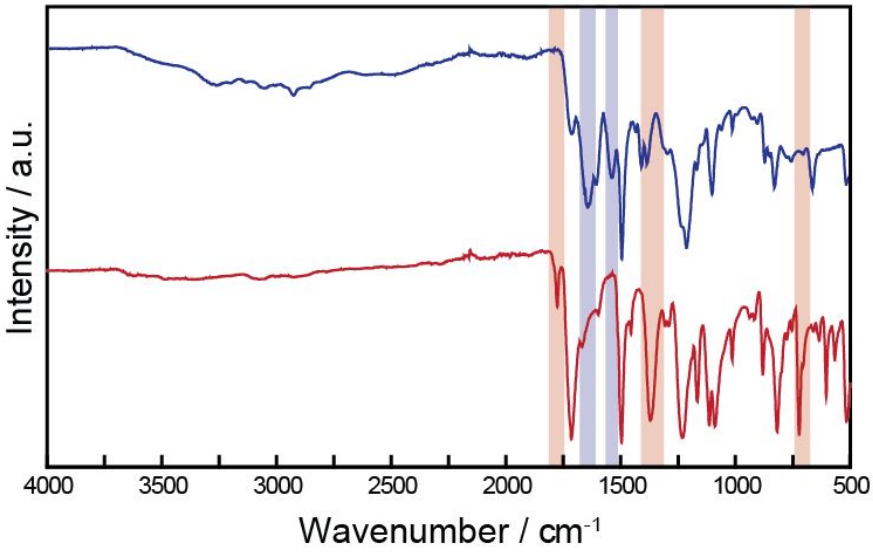

Figure S9. FT-IR spectra of **PAA** (top) and **PI** (bottom)

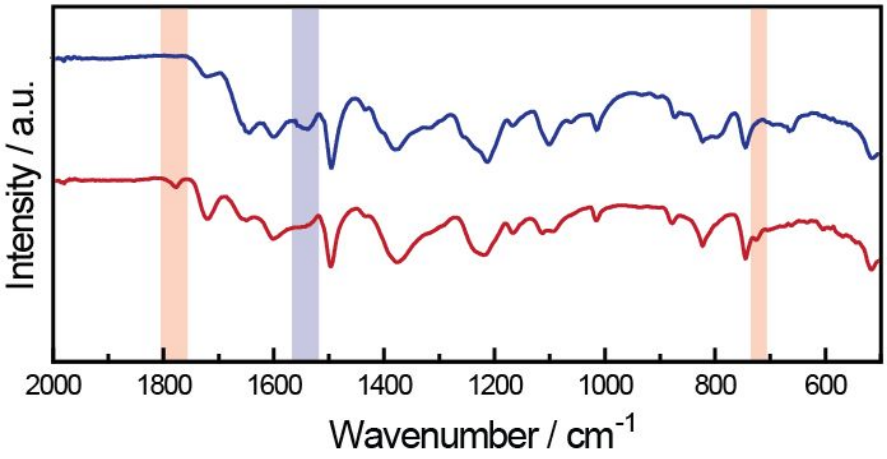

Figure S10. FT-IR spectra of **MOF-5/PAA** (top) and **MOF-5/PI** (bottom)

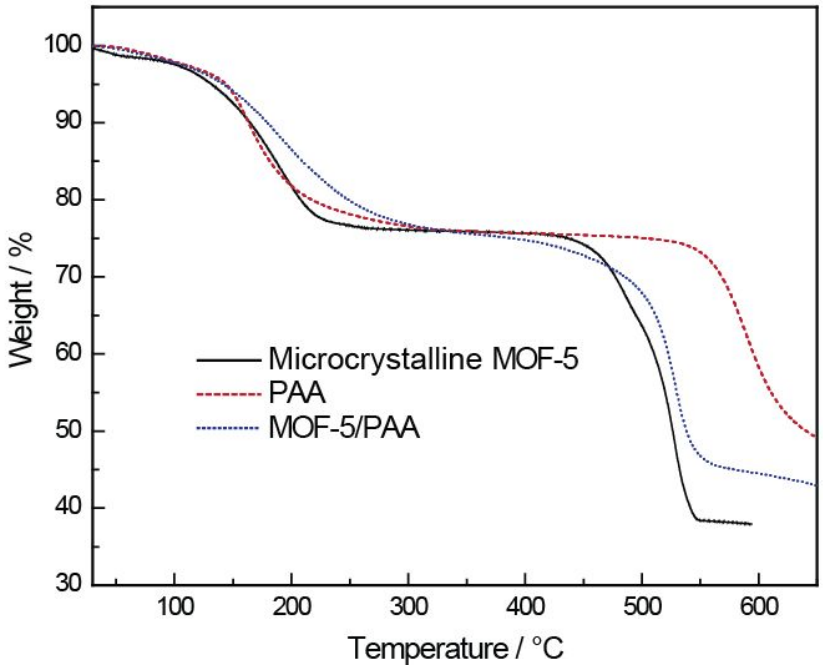

Figure S11. TGA curves of microcrystalline MOF-5 (black), **PAA** (red, dashed), and microcrystalline 77% **MOF-5/PAA** (blue, dotted).

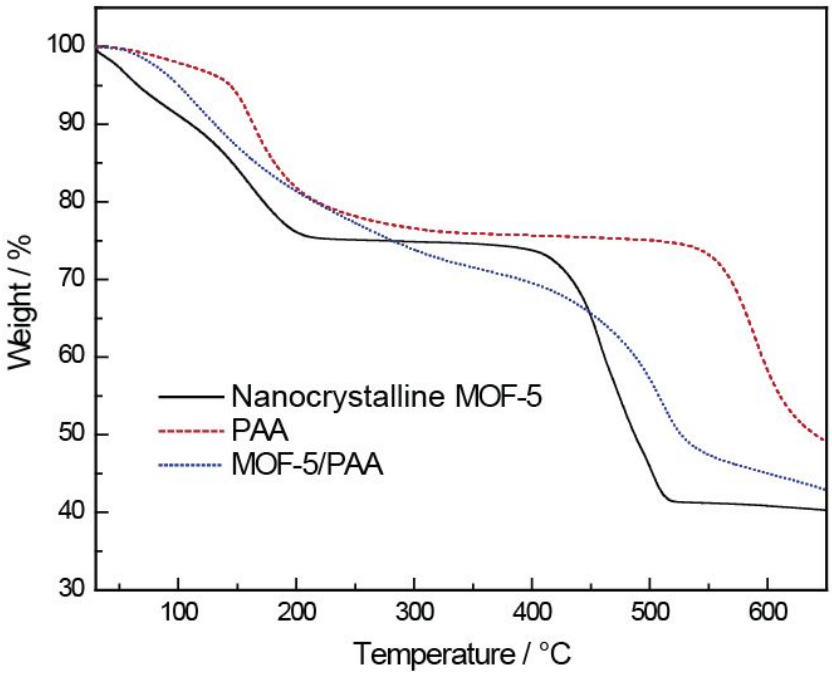

Figure S12. TGA curves of nanocrystalline MOF-5 (black), **PAA** (red, dashed), and nanocrystalline 50% **MOF-5/PAA** (blue, dotted).

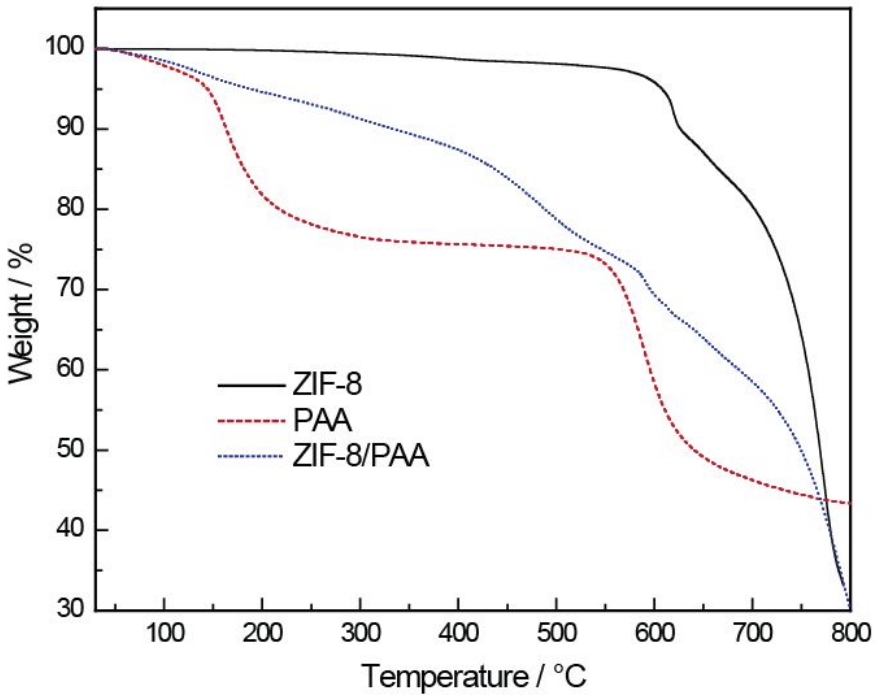

Figure S13. TGA curves of ZIF-8 (black), **PAA** (red, dashed), and 50% **ZIF-8/PAA** (blue, dotted).

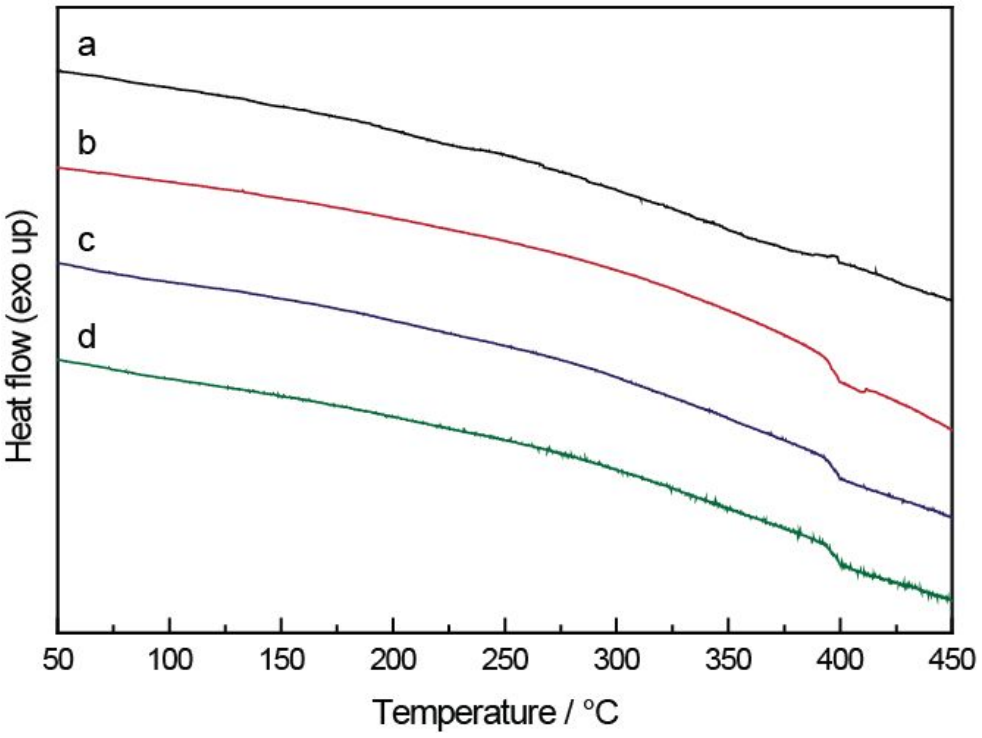

Figure S14. DSC cooling curves of (a) PAA (T_g = 399°C), (b) microcrystalline 77% **MOF-5/PAA** (T_g = 396°C), (c) nanocrystalline 50% **MOF-5/PAA** (T_g = 399°C), and (d) 50% **ZIF-8/PAA** (T_g = 399°C).

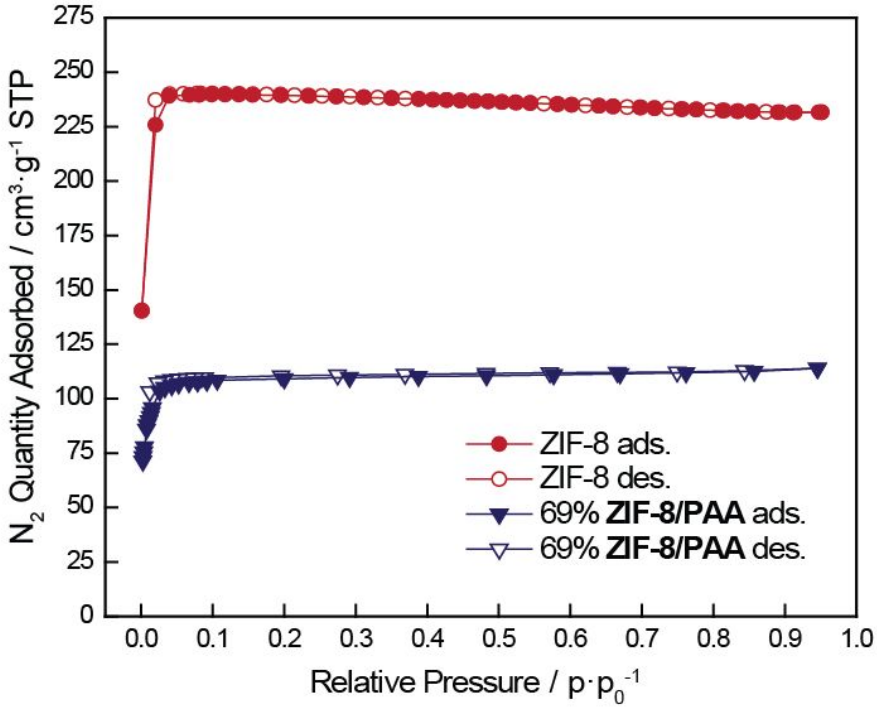

Figure S15. N_2 adsorption-desorption isotherms of ZIF-8 (top) and 69% **ZIF-8/PAA** (bottom).

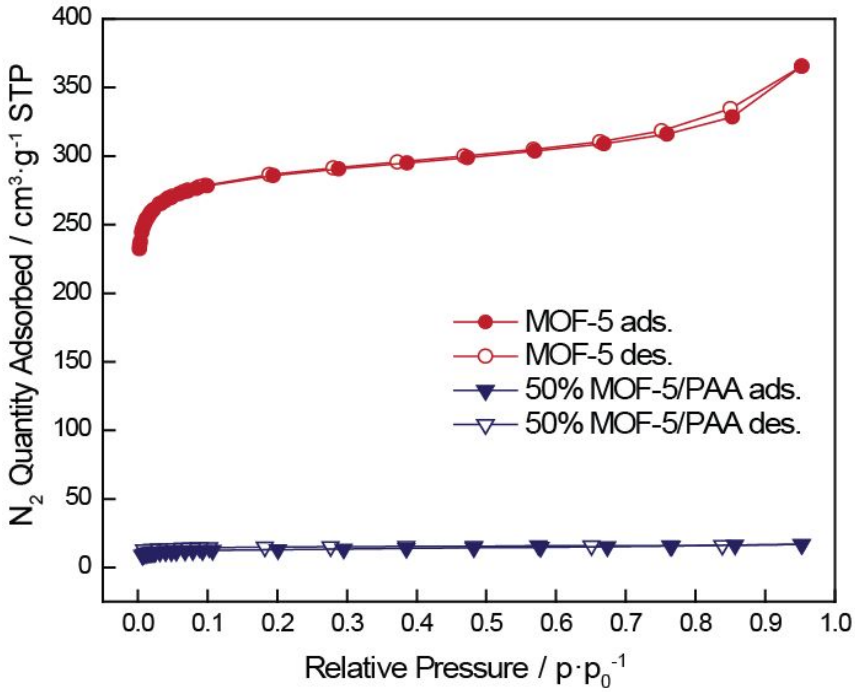

Figure S16. N_2 adsorption-desorption isotherms of nanocrystalline MOF-5 (top) and nanocrystalline 50% **MOF-5/PAA** (bottom).