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SUPPORTING INFORMATION (SI)

Effect of Catenation and basicity of Pillared Ligand on the Water Stability of MOFs

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EXPERIMENTAL SECTION

1. Characterization

1.1 PXRD (Powder X-Ray diffraction) patterns

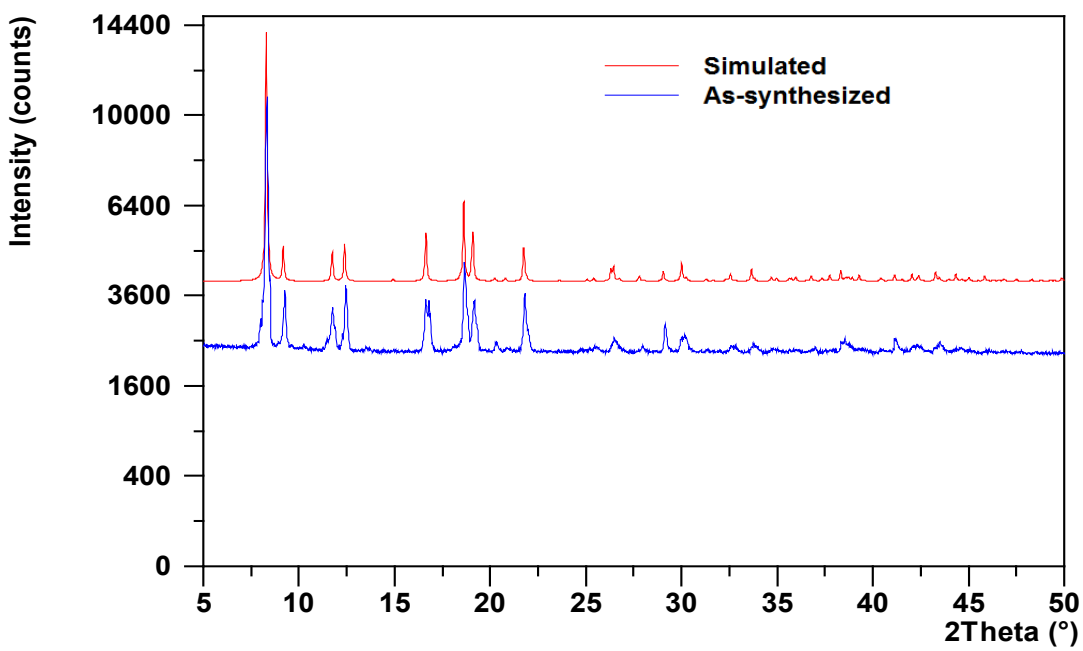

Figure S1: Comparison of PXRD pattern for as-synthesized Zn-BDC-DABCO or DMOF and its theoretical pattern from single crystal data

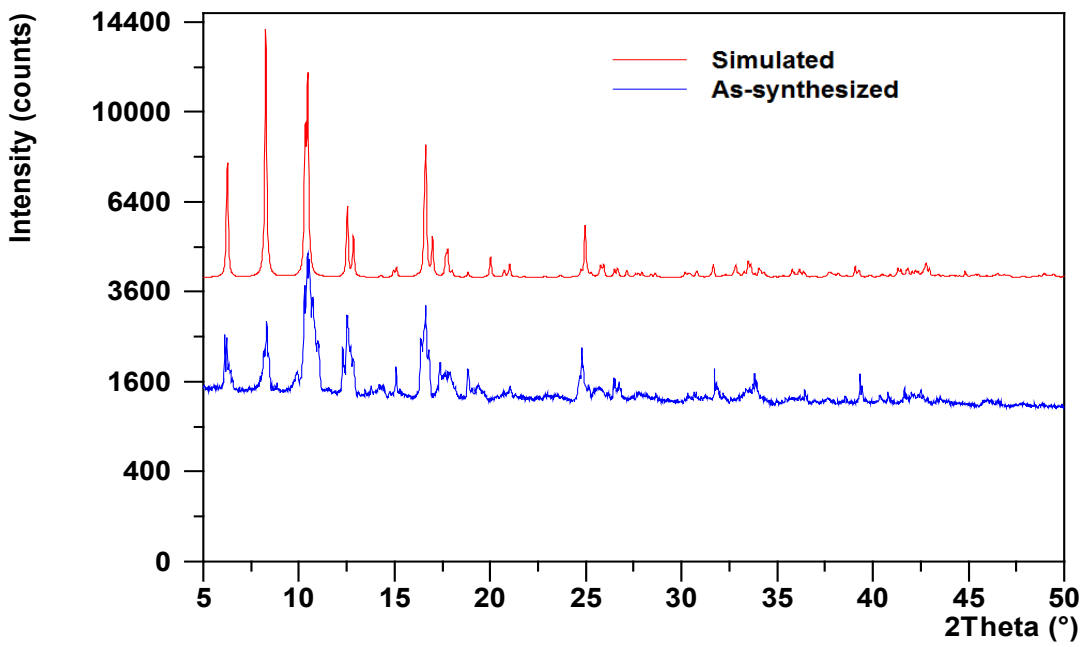

Figure S2: Comparison of PXRD pattern for as-synthesized Zn-BDC-BPY or MOF-508a and its theoretical pattern from single crystal data

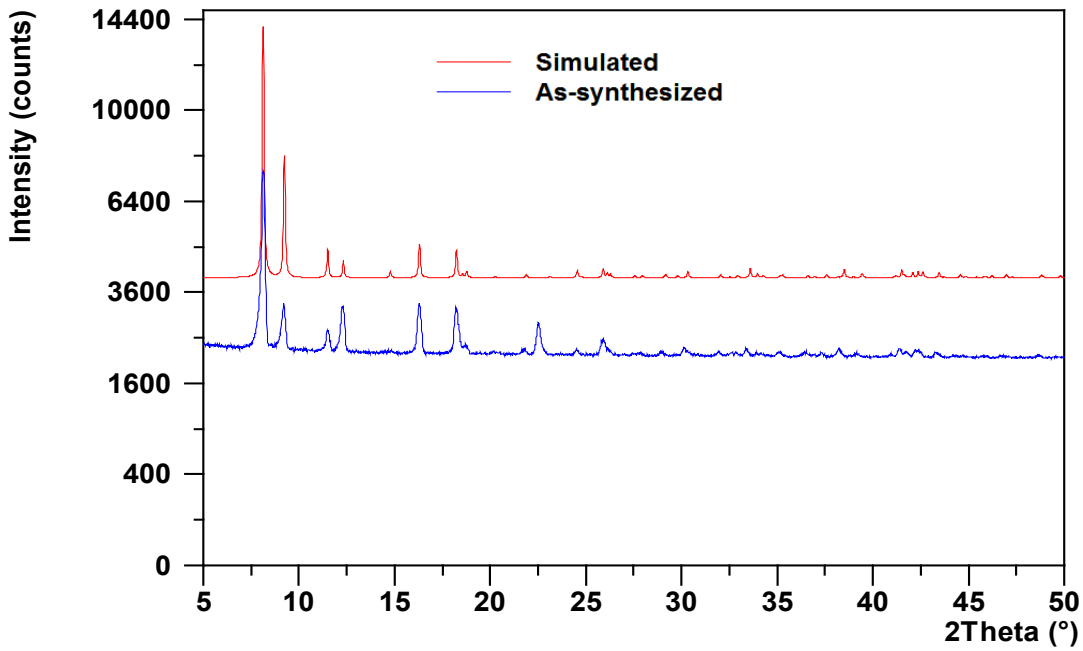

Figure S3: Comparison of PXRD pattern for as-synthesized Zn-TMBDC-DABCO or DMOF-TM and its theoretical pattern from single crystal data

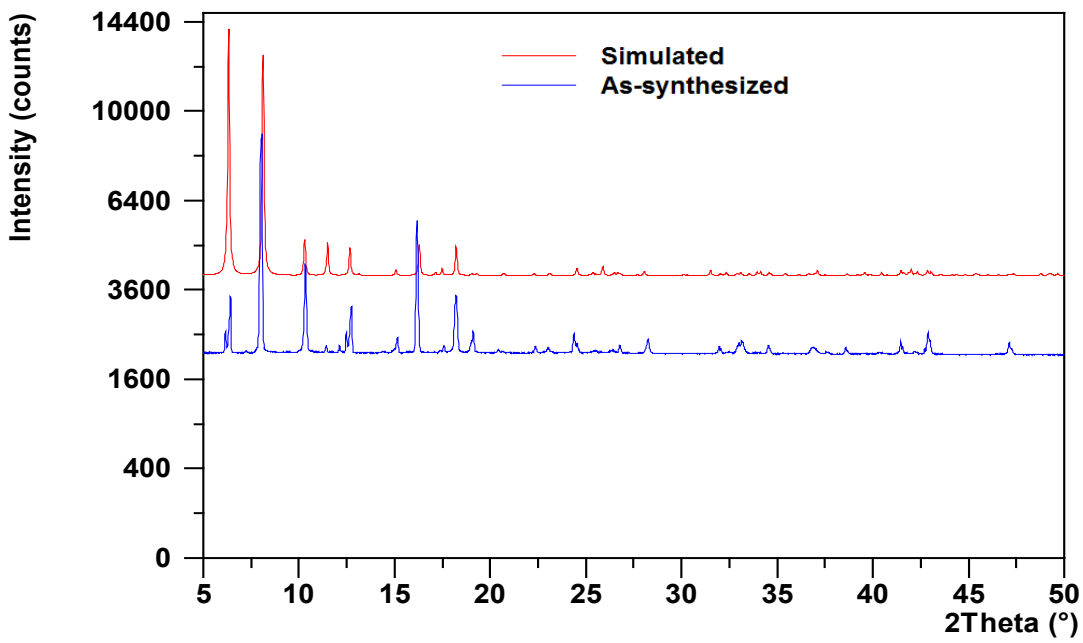

Figure S4: Comparison of PXRD pattern for as-synthesized Zn-TMBDC-BPY or MOF-508-TM and its theoretical pattern from single crystal data

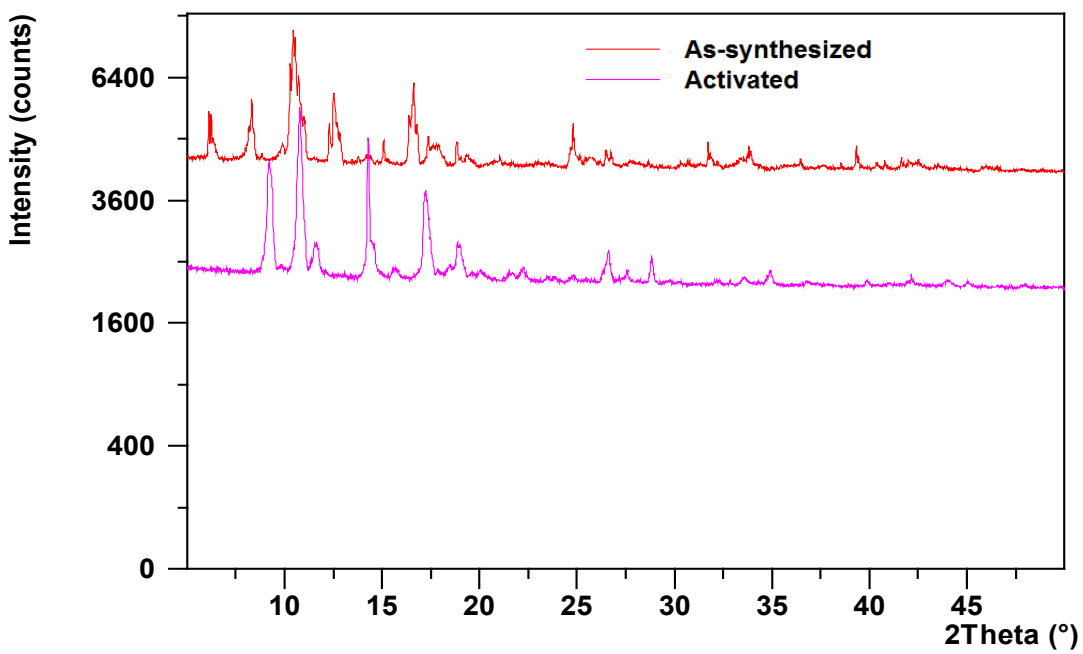

Figure S5: PXRD patterns for as-synthesized Zn-BDC-BPY or MOF-508a and activated Zn-BDC-BPY or MOF-508b displaying shifting of peaks towards right on activation which was also observed by Chen et. al.[1]

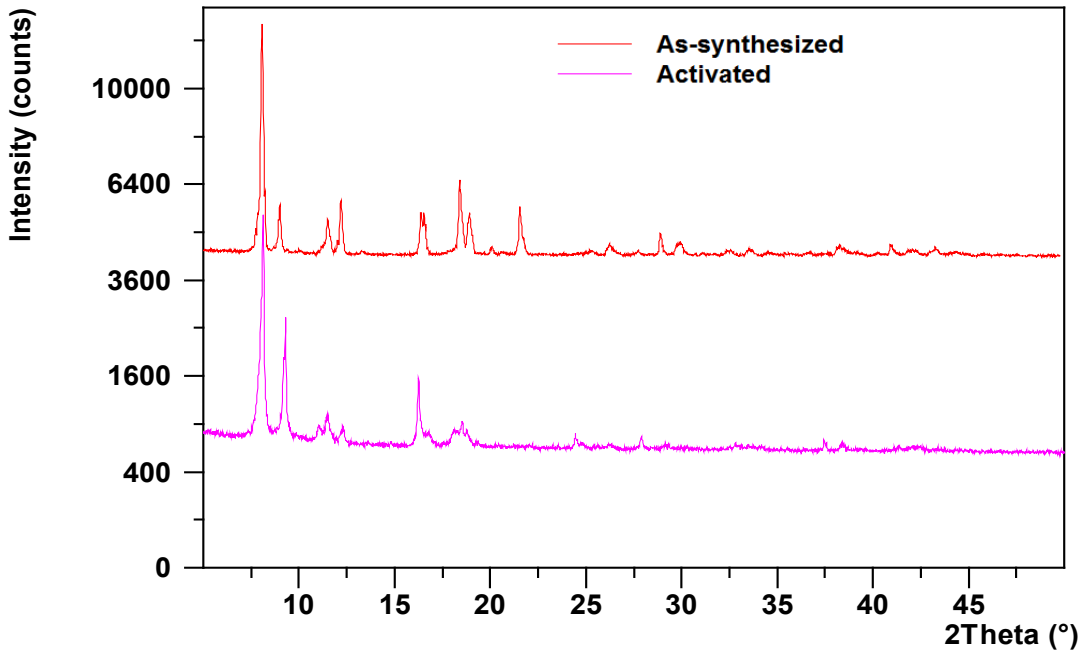

Figure S6: PXRD patterns for as-synthesized and activated Zn-BDC-DABCO or DMOF displaying no change up on activation which was also observed by Lee et. al.[2]

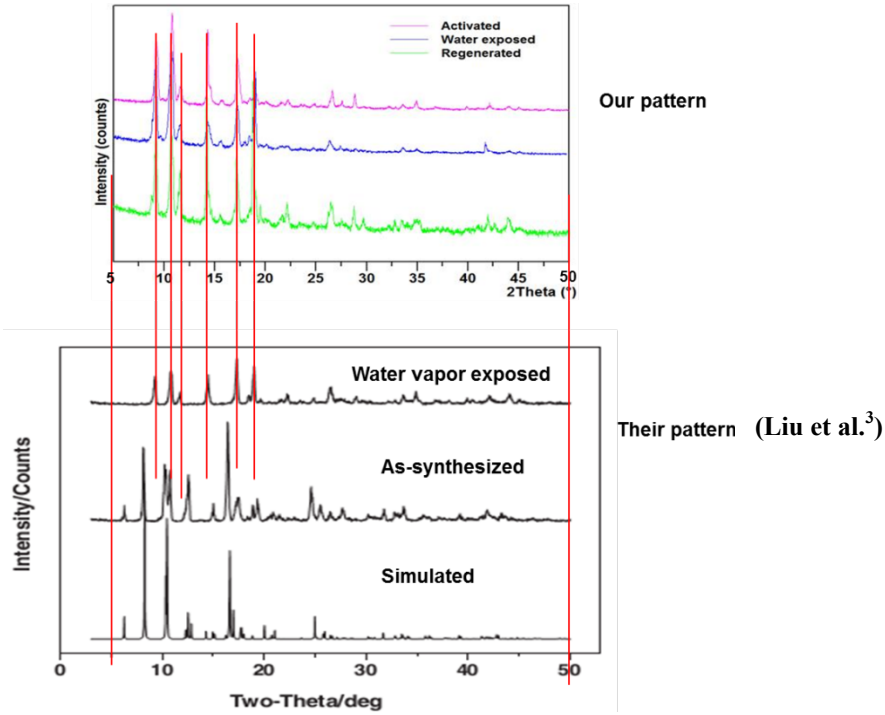

Figure S7: Comparison of PXRD patterns for water exposed MOF-508 sample obtained in our work and reported by Liu et al.[3]

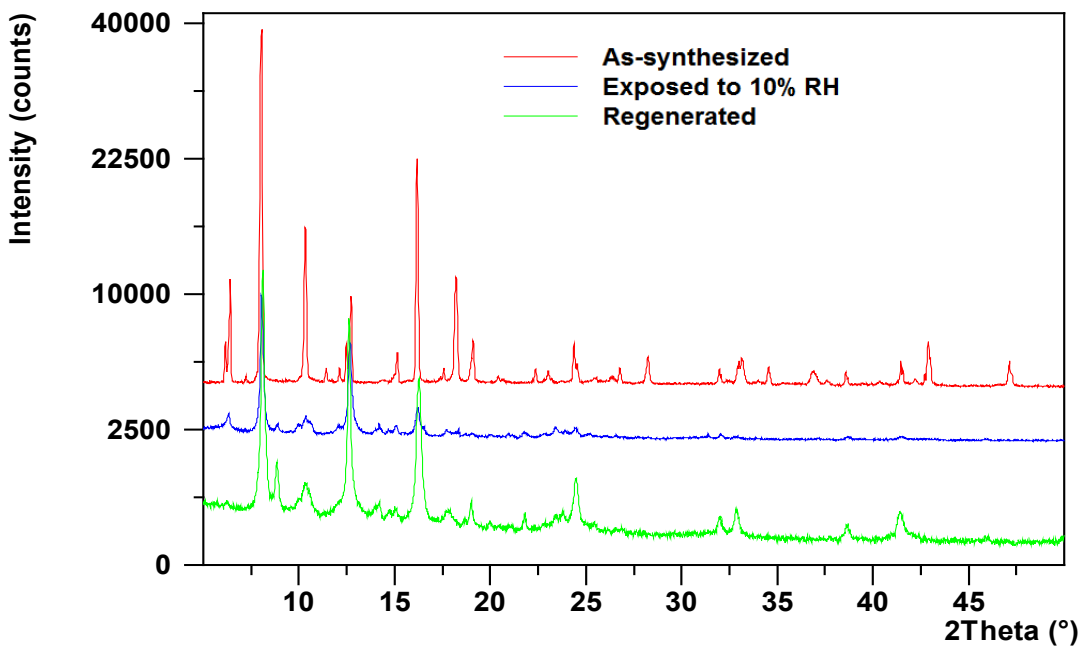

Figure S8: PXRD patterns as-synthesized (top), water exposed (only up to 10% RH, middle) and regenerated (bottom) Zn-TMBDC-BPY or MOF-508-TM

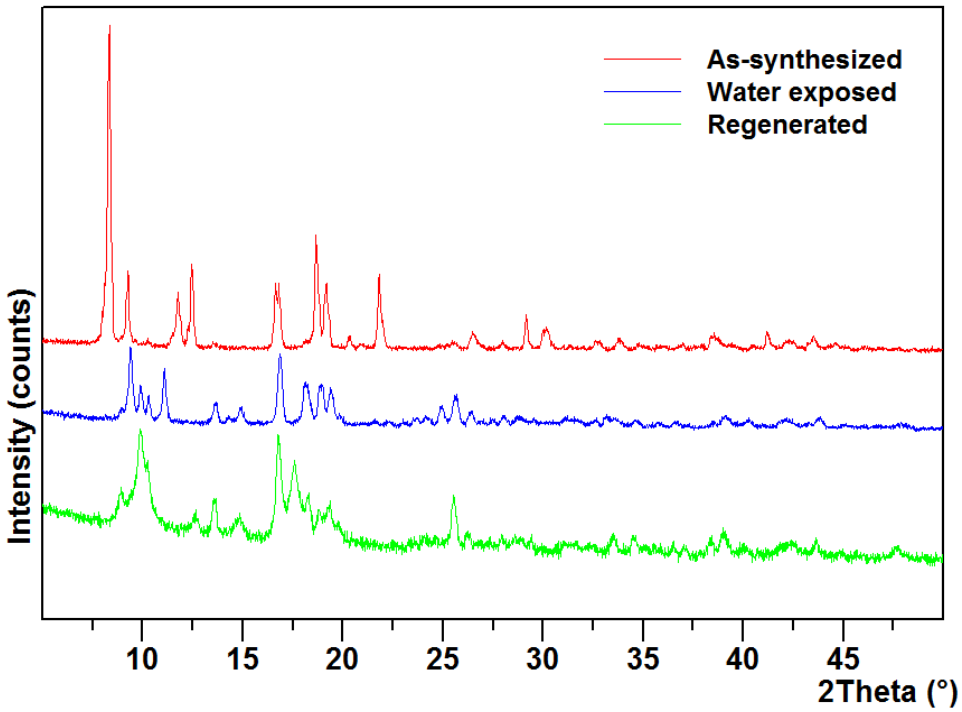

Figure S9: PXRD patterns as-synthesized (top), water exposed (upon 90% RH, middle) and regenerated (bottom) Zn-BDC-DABCO or DMOF.[4]

1.2 Nitrogen adsorption isotherms

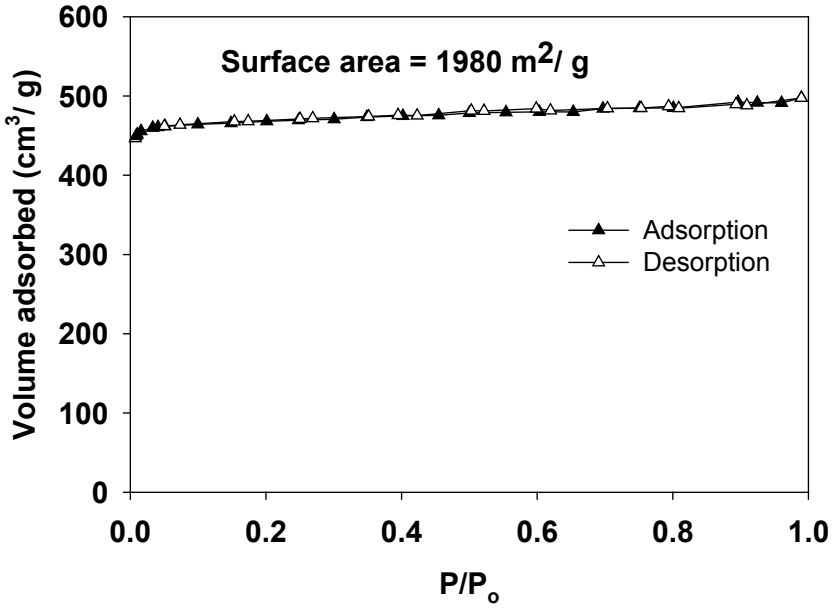

Figure S10: Nitrogen isotherm of activated Zn-BDC-DABCO or DMOF[4] at 77 K (closed symbols – adsorption, open symbols – desorption)

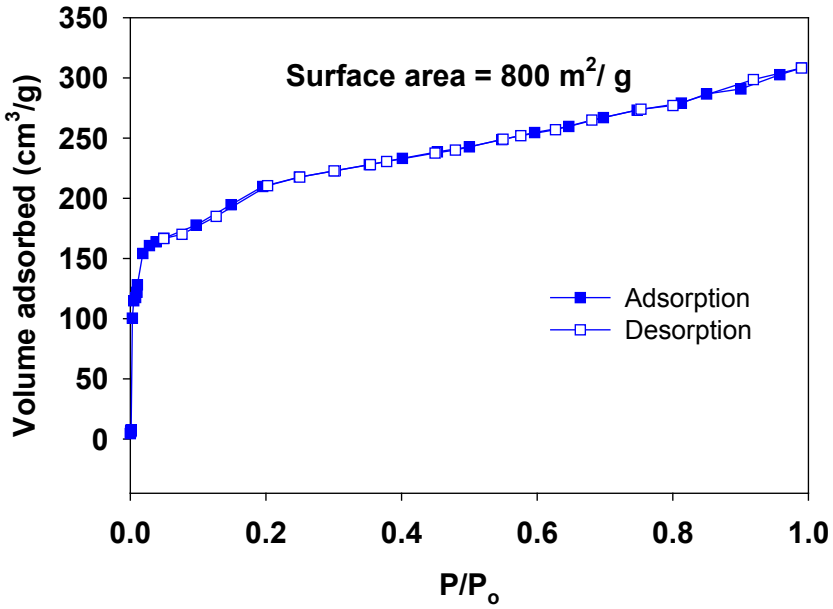

Figure S11: Nitrogen isotherm of activated Zn-BDC-BPY or MOF-508b at 77 K (closed symbols – adsorption, open symbols – desorption)

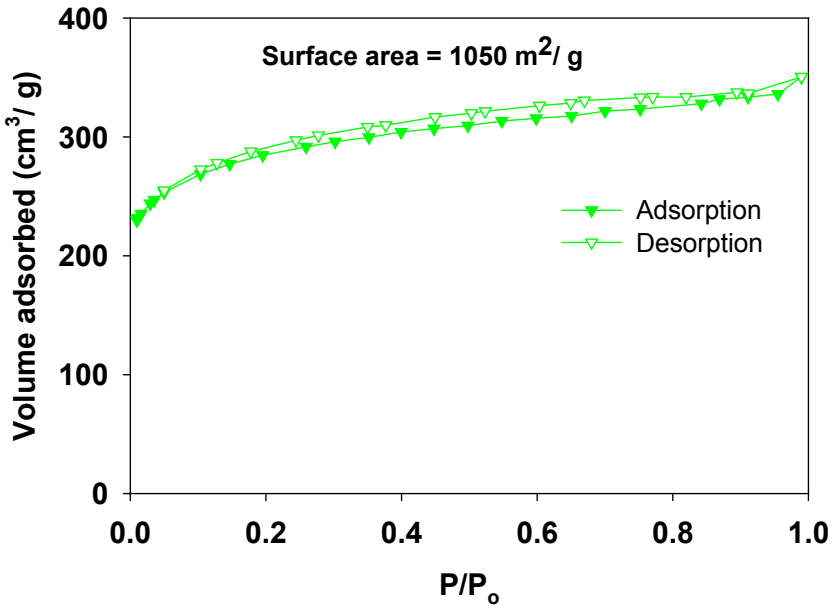

Figure S12: Nitrogen isotherm of activated Zn-TMBDC-DABCO or DMOF-TM at 77 K (closed symbols – adsorption, open symbols – desorption)

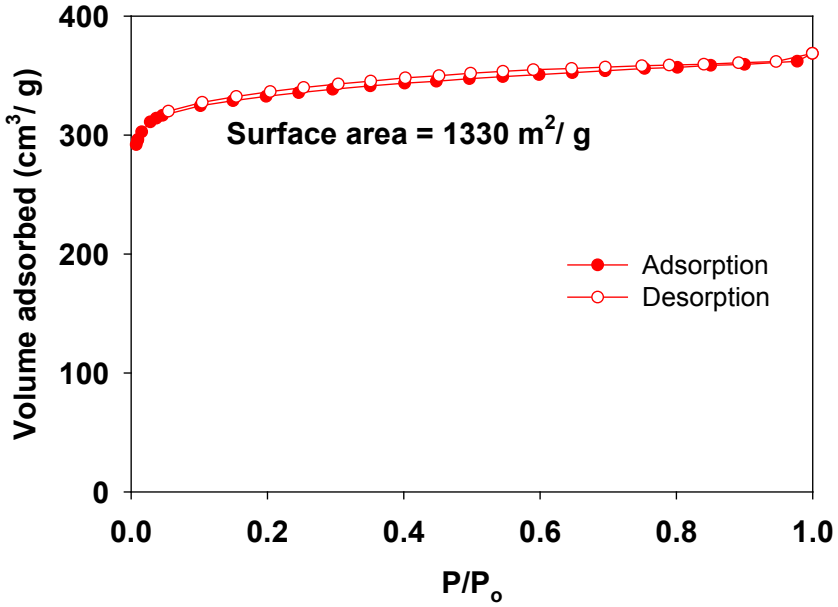

Figure S13: Nitrogen isotherm of activated Zn-TMBDC-BPY or MOF-508-TM at 77 K (closed symbols – adsorption, open symbols – desorption)

Table S1: Comparison of properties of pillared MOFs

Material	Pore Volume† (cm^3/g)	Pore Diameter (c, a, b) ‡ (Å)	Activation process (under vacuum)	Thermal Stability‡ (^oC)
[4]DMOF	0.75	7.5x7.5,4.8x3.2,4.8x3.2	110 ^oC (12 h)	300
MOF-508$	0.42	4x4, -, -	110 ^oC (12 h)	360
[5]DMOF-TM	0.51	3.5, -, -	110 ^oC (12 h)	320
MOF-508-TM	0.56	3.5,8x10,8x10	25 ^oC (12h)#	250

†Obtained from the Dubinin-Astakov model of N_2 adsorption at 77K
‡ Obtained from literature[1-2, 6]
#Solvent exchange with chloroform
$Only this MOF is doubly interpenetrated 3-D pillared MOF

2. REFERENCES

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