Supporting information

Crystallization in THF: the possibility of one-pot synthesis of mixed matrix membranes containing MOF MIL-68(Al)

Beatriz Seoane, Víctor Sebastián, Carlos Téllez, Joaquín Coronas*

Chemical and Environmental Engineering Department and Nanoscience Institute of Aragon, Universidad de Zaragoza, 50018 Zaragoza, Spain

*Corresponding author: coronas@unizar.es

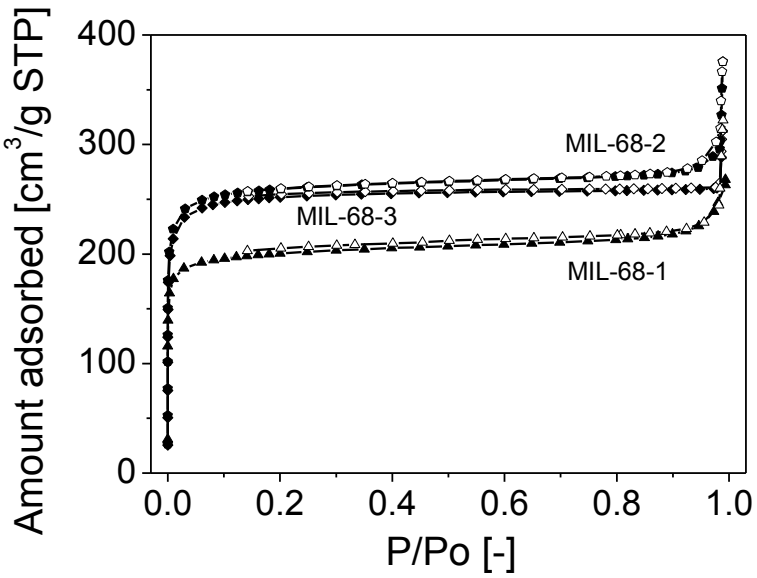

Fig. S1 N_2 adsorption isotherms at 77 K of MIL-68(Al) synthesized at different concentrations of the synthesis gel (Table 1).

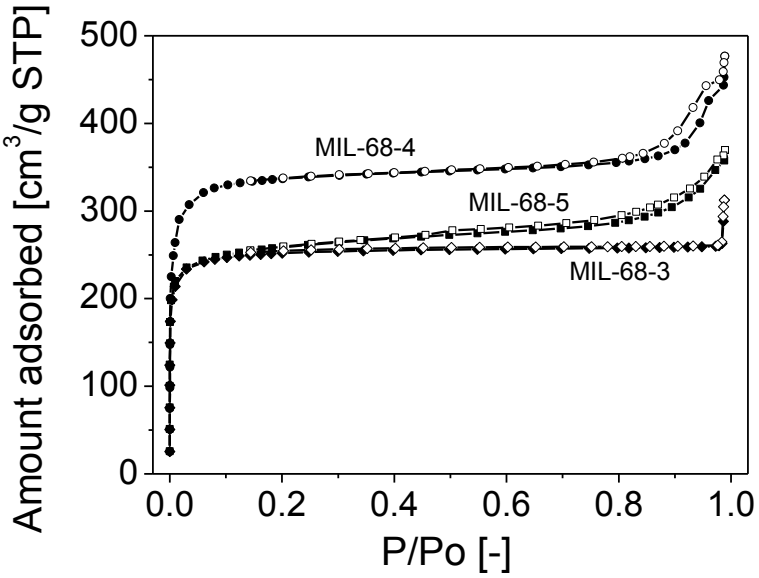

Fig. S2 N_2 adsorption isotherms at 77 K of MIL-68(Al) synthesized at different temperatures (Table 1).

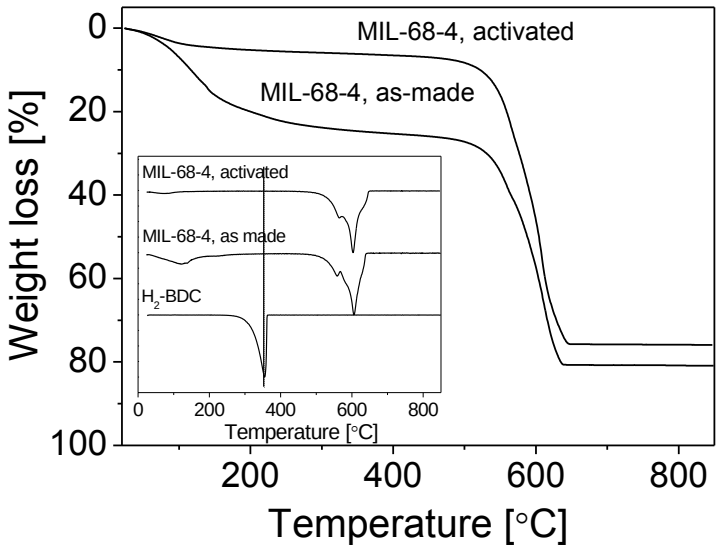

Fig. S3 TGA curves and the corresponding derivatives (inset) of the as-synthesized and activated materials (MIL-68-4 conditions, Table 1). For comparison, the derivative for the ligand (H_2-BDC) is shown.

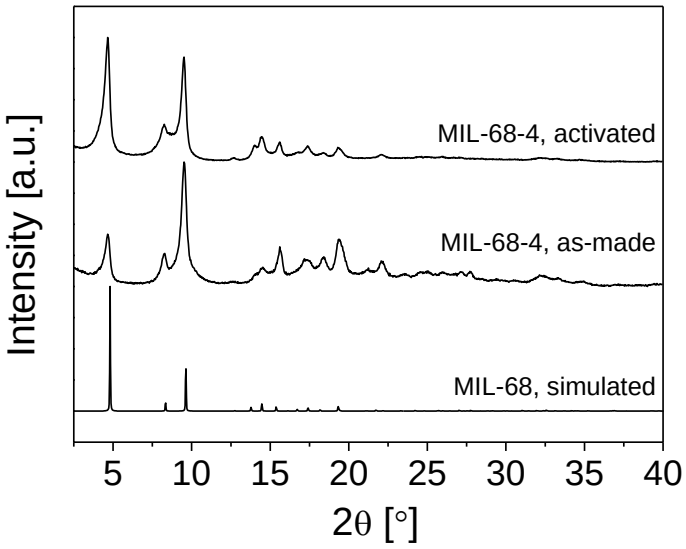

Fig. S4 XRD diffraction patterns of simulated MIL-68 topology and the as-synthesized and activated materials (MIL-68-4 conditions, Table 1).

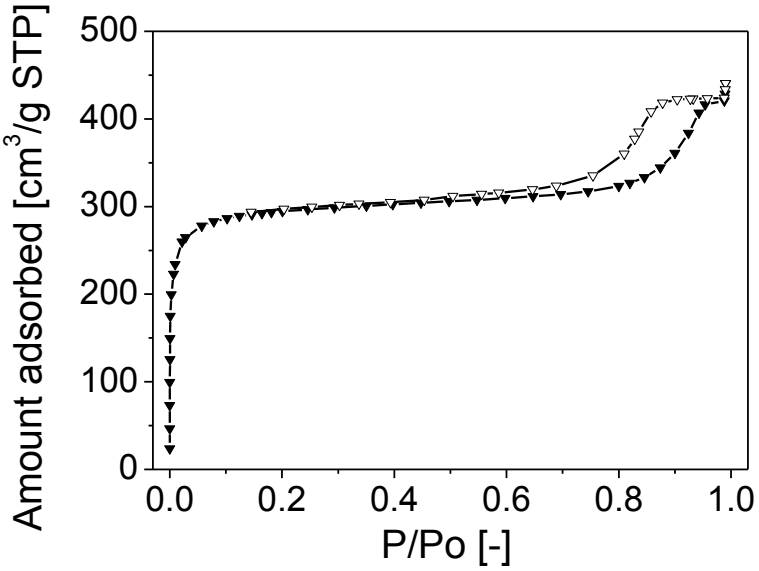

Fig. S5 N_2 adsorption isotherms at 77 K of MIL-68(Al) synthesized in the presence of PSF (MIL-68-6, Table 1).

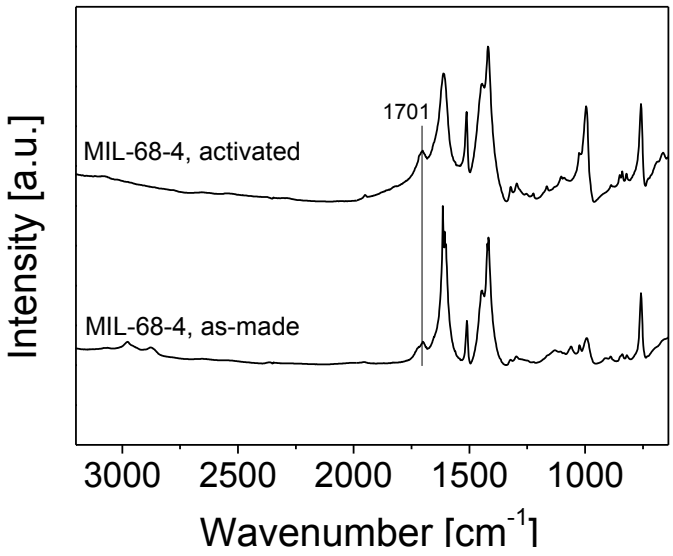

Fig. S6 FTIR spectra of the as-synthesized and activated materials (MIL-68-4 conditions, Table 1).

Table S1 CO_2/CH_4 and H_2/CH_4 separation data for PSF-based MMMs prepared with different MOFs.

MOF	Loading (wt%)	Polymer	Operating conditions			Fig. 8 code	Ref	P_{CO2} [Barrer]	P_{CO2}/P_{CH4} [-]	P_{H2} [Barrer]	P_{H2}/P_{CH4} [-]
			Analysis	T [ºC]	ΔP [bar]						
$[Cu_2(PF_6)(NO_3)(4,4'\text{-bby})_4]\cdot 2PF_6\cdot 2H_2O$	5	PSF	Single gas	35	1	A	[1]	-	-	9.8	200
HKUST-1	5	PSF	-	-	-	B	[2]	7.7	21.5	11.3	32
HKUST-1	16	PSF	Mixture (1:1)	35	2	C	[3]	8.8	15.7	17.5	53.5
NH_2-MIL-53(Al)	25	PSF	Mixture (1:1)	-10	10	D	[4]	2.4	117	-	-
ZIF-8	16	PSF	Mixture (1:1)	35	2	E	[3]	12.1	19.8	39.8	118
MIL-68(Al)	0	PSF	Mixture (1:1)	35	3	PSF	This work	5.4	31.1	11.5	62.3
	8					M2	This work	4.7	36.5	12.3	77

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3. B. Zornoza, B. Seoane, J. M. Zamaro, C. Téllez and J. Coronas, *ChemPhysChem*, 2011, **12**, 2781-2785.
4. B. Zornoza, A. Martinez-Joaristi, P. Serra-Crespo, C. Tellez, J. Coronas, J. Gascon and F. Kapteijn, *Chem. Commun.*, 2011, **47**, 9522-9524.