

Nanocomposite MFI-alumina hollow fibre membranes: Influence of NO_x and propane on the CO₂/N₂ separation properties

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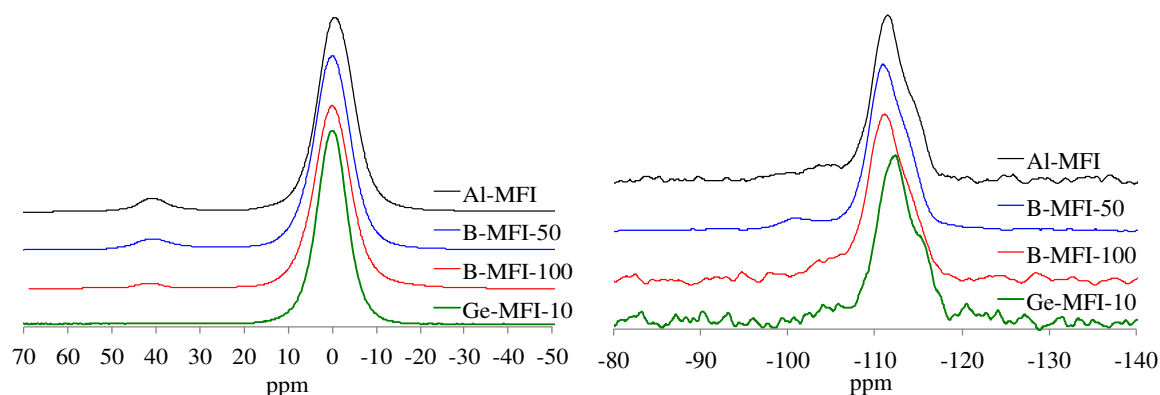


Figure S11. NMR spectra of ²⁷Al (left) and ²⁹Si (right) obtained on crushed fibres.

Table S11. Molar percentage of the different configuration of ²⁹Si and ²⁷Al MAS NMR for Al-MFI, B-MFI-50, B-MFI-100 and Ge-MFI-10 crushed hollow fibres

Species	Al-MFI	B-MFI-50	B-MFI-100	Ge-MFI-10
Si(2Al)	1.45	-	-	-
Si(1Al)	12.1	16.08	17.07	8.18
Si(0Al)	86.46	83.92	82.93	91.82
Al(IV)	5.23	4.61	2.65	0.50
Al(VI)	94.77	95.39	97.35	99.50

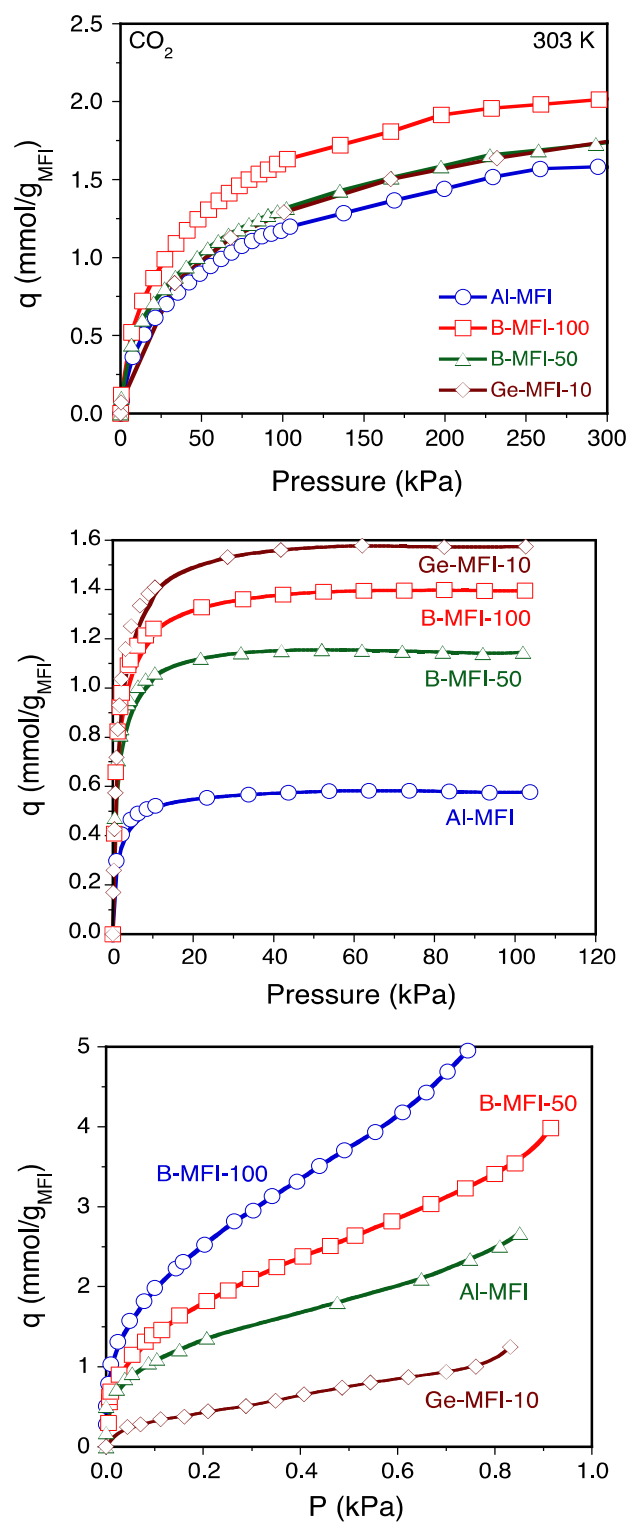


Figure SI2. Adsorption isotherms of CO₂ (top), propane (middle) and water (bottom) at 303 K on crushed 20 MFI-alumina hollow fibres.

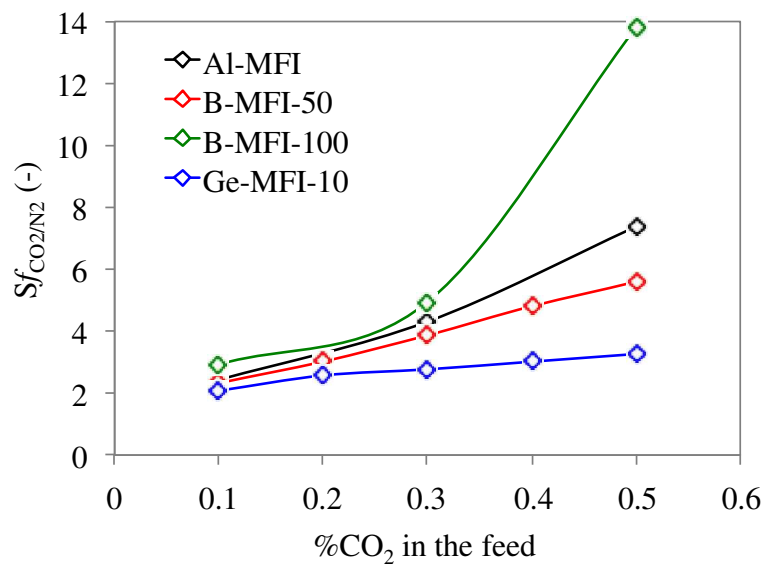


Figure SI.3. Evolution of the CO₂/N₂ (air) separation factor as a function of the feed CO₂ molar fraction for the isomorphously substituted membranes. Experimental conditions: temperature, 295 K; feed flow rate, 500 NmL/min; sweep flow rate, 80 NmL/min; feed pressure, 200 kPa; permeate pressure, 150 kPa.

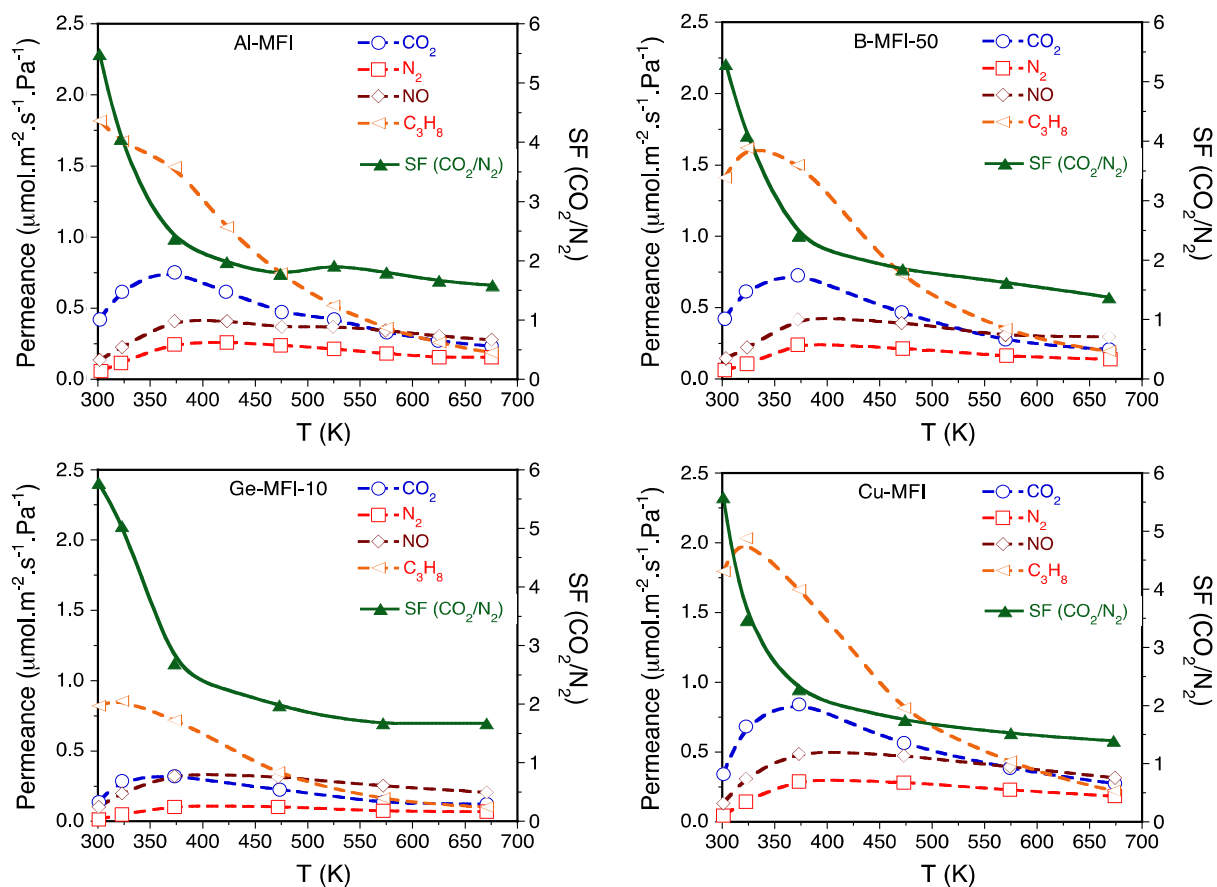


Figure S14. Evolution of the CO_2 (open circles), N_2 (open squares), C_3H_8 (inverse open triangles) and NO (open diamonds) permeances and CO_2/N_2 separation factor (filled triangles) as a function of temperature for the Al-MFI, B-MFI-50, Ge-MFI-10 and Cu-ZSM-5 hollow fibres. Experimental conditions: Feed composition 10 CO_2 : 1 C_3H_8 : 2 O_2 : 0.5 NO : 86.5 N_2 ; Feed flowrate, 500 $\text{cm}^3(\text{STP})/\text{min}$; sweep flowrate, 200 $\text{cm}^3(\text{STP})/\text{min}$; feed pressure, 200 kPa; trans fibre pressure, 50 kPa.