Electronic Supplementary Material (ESI) for RSC Advances.

Effect of relative humidity on the gas transport properties of Zeolite A/PTMSP mixed matrix membranes

Ana Fernández-Barquín[1]; Riccardo Rea[2]; Davide Venturi[2]; Marco Giacinti-Baschetti[2]; Maria Grazia De Angelis[2]; Clara Casado-Coterillo[1]; Ángel Irabien[1]

1 Department of Chemical and Biomolecular Engineering. ETSIIT. Universidad de Cantabria. Avda Los Castros S/N. 39005 Santander. Spain.

2 Dipartimento di Ingegneria Civile Chimica Ambientale e dei Materiali, Alma Mater Studiorum-Universita di Bologna, Via Terracini 28, Bologna, Italy

Electronic Supplementary Information

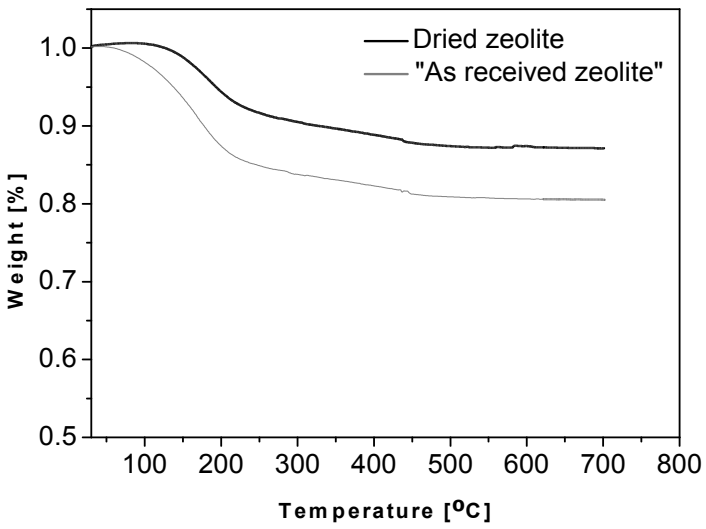
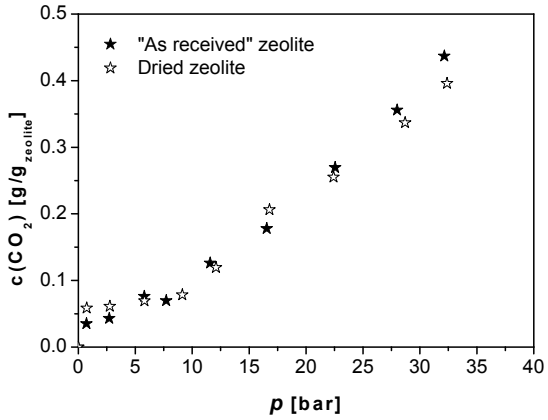
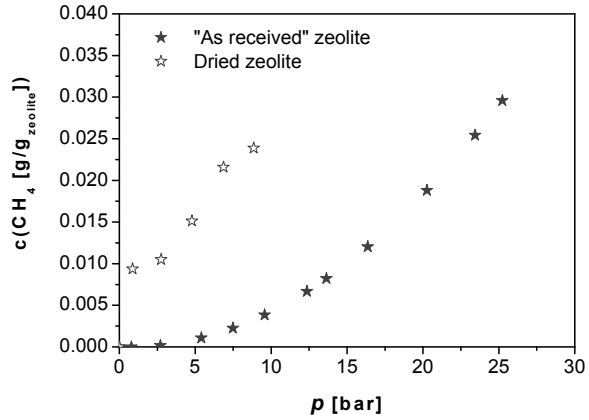


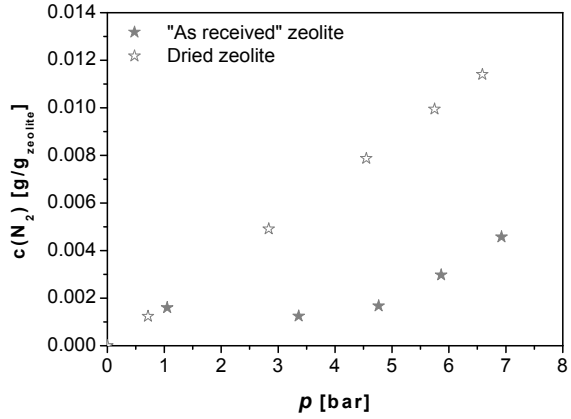
Figure S1. TGA of undried "as received" and dried zeolite.



(a)

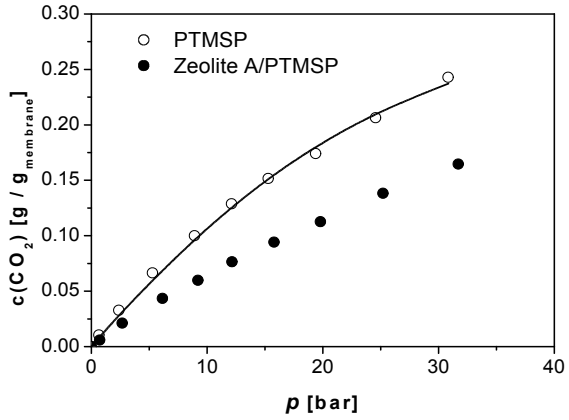


(b)

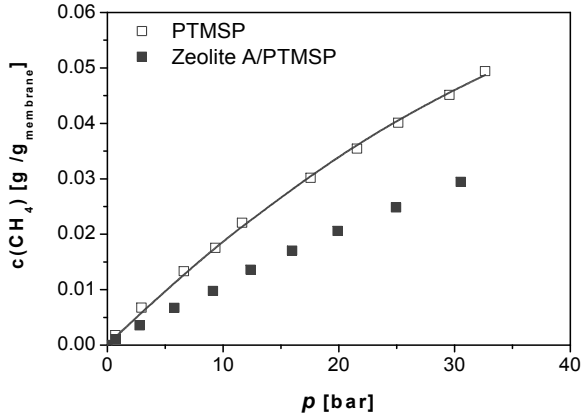


(c)

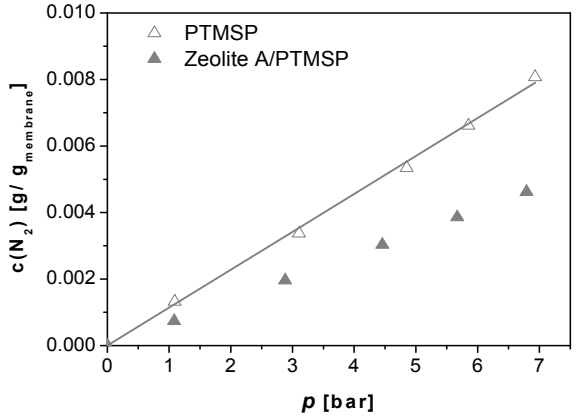
Figure S2. Gas sorption isotherms of (a) CO_2 (a), (b) CH_4 and (c) N_2 onto the Zeolite A particles "as received" (full symbols) and dried at 100 ºC for 24h under vacuum (void symbols).



(a)



(b)



(c)

Figure S3. Experimental gas sorption isotherms at 35 ºC of (a) CO_2, (b) CH_4 and (c) N_2 for the pristine PTMSP membrane and the Zeolite A/PTMSP MMM. The solid line represents the adjustment with the NELF model.

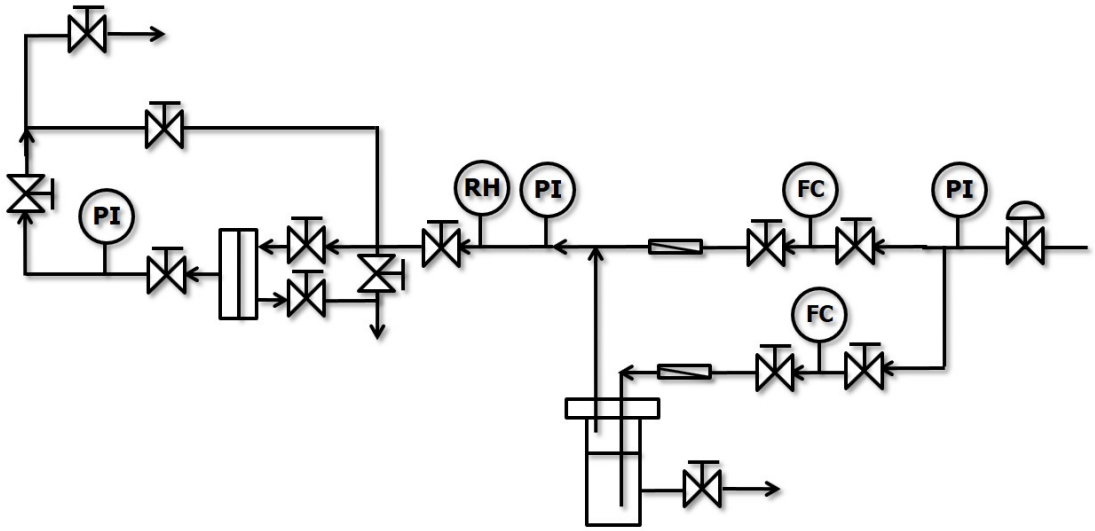


Figure S4. Humid permeometer setup. Redrawn from [1,2].

1 M. Minelli, M. G. Baschetti, F. Doghieri, M. Ankerfors, T. Lindström, I. Siró and D. Plackett, *J. Memb. Sci.*, 2010, **358**, 67–75.

2 J. Catalano, T. Myezwa, M. G. De Angelis, M. G. Baschetti and G. C. Sarti, *Int. J. Hydrogen Energy*, 2012, **37**, 6308–6316.

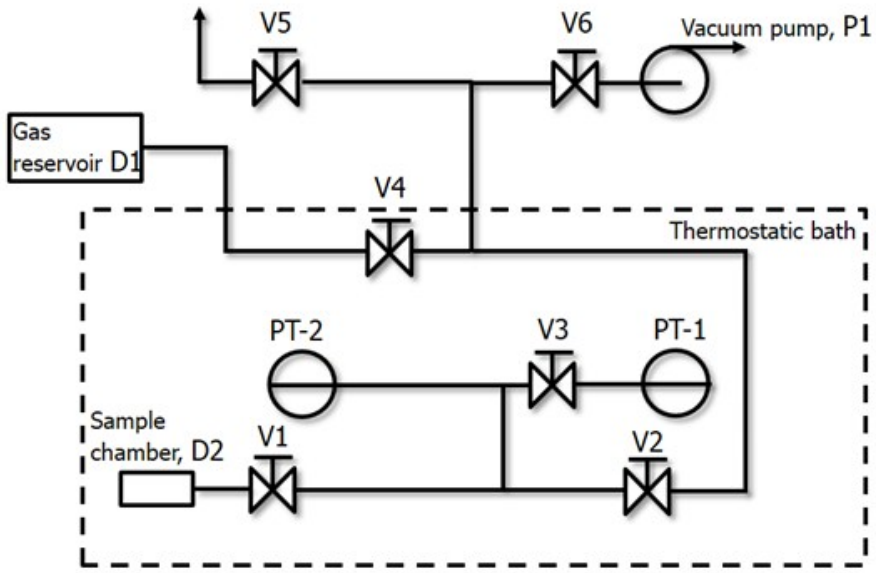


Figure S5. Pressure decay experimental equipment. D1: Gas reservoir, D2: Membrane sample chamber, PT-1: low pressure transducer, PT-2: High pressure transducer, V1: sample chamber valve, V1-V2 with V3 opened: pre-chamber PT-1, V1-V2-V3: pre-chamber PT-2, V4: feed valve, V5: vent valve, V6: vacuum valve.