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Supporting information

A novel method for fabrication of high-flux zeolite membranes on supports with any geometry

Liang Yu*, Allan Holmgren and Jonas Hedlund

Chemical Technology, Luleå University of Technology, SE-971 87 Luleå, Sweden

E-mail: liang.yu@ltu.se

1. Measurement of single gas permeation of tubular zeolite CHA membranes

To evaluate the quality of the membranes, the single gas helium permeance was measured at 6 bar feed pressure and atmospheric permeate pressure at room temperature before calcination. Single gas permeation experiments of He, CO_2, H_2 and SF_6 were carried out at room temperature using 2 bar (absolute) feed pressure and atmospheric permeate pressure directly after calcination.

Single gas SF_6 permeance was employed to evaluate the quality of the tubular zeolite CHA membranes. The SF_6 molecule having a kinetic diameter of 0.55 nm can only permeate through defects and, accordingly, this test is suitable for membrane quality evaluation [1].

2. Gas permeation results of zeolite membranes

2.1 Permporometry patterns of tubular zeolite MFI membranes

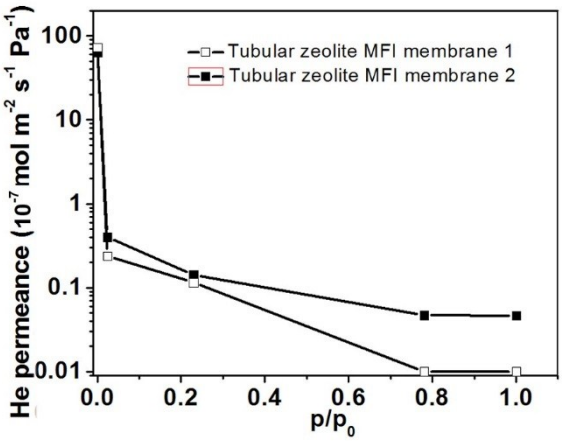

Figure S1. Adsorption branch He permporometry patterns of two tubular zeolite MFI membranes using n-hexane as adsorbate. The He permeance was measured as a function of p/p_0 of a hydrocarbon. The pressure difference over the membrane was about 1 bar and the permeate side was at atmospheric pressure.

2.2 Single gas permeance of tubular zeolite CHA membranes

Table S1. Single gas permeance of tubular zeolite CHA membranes prepared in two different batches using the same masking method. The feed and permeate pressures are 2 and 1 bar, respectively, for the test after calcination.

Membranes	Before calcination	After calcination				
	He	He	H_2	CO_2	SF_6	H_2/SF_6
M1	0.040	26	60	99	0.13	462
M2	0.002	37	100	154	0.09	1111
Average	0.021	32	80	127	0.11	787

Reference

[1] H.H. Funke, M.Z. Chen, A.N. Prakash, J.L. Falconer, R.D. Noble, Separating molecules by size in SAPO-34 membranes, *J. Membr. Sci.* **2014**, *456*, 185-191.