Thin ionic liquid membranes based on inorganic supports with different pore sizes

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Table S1. Experimental viscosity, μ, and solubility, S, as a function of temperature in [emim][Ac]

Temperature (ºC)	CO_2 solubility[16], S (mol_{CO_2}/L_{IL}, mole fraction)	Viscosity[49], μ (cP)
25	2.19, 0.267	143.61
30	2.09, 0.257	105.30
40	1.81, 0.231	61.33
50	1.62, 0.212	38.95
60	1.41, 0.189	26.47

Table S2. Performance of SILM-2.5, prepared by spray-coating procedure in comparison to current materials for CO_2/N_2 separation

Support (pore size) – IL	Thickness, δ [μm]	Op. cond. T [ºC] – Δp [bar]	CO_2 perm., PCO_2, [10^{-9} mol/(m^2·s·Pa)]	Selectivity, α(CO_2/N_2), [-]	Ref.
Polymers (Robeson´s upper bound)					
PIM-1 (< 2nm)	46	30 – 0.3	16.7	25	(51)
PIM-7 (< 2nm)	28	30 – 0.3	13.2	26.2	(51)
Polymeric-based IL membranes					
Polyethersulfone (200 nm) – [emim][CF_3SO_3]	150	RT – 0.19	2.06	35	(12)
Polyethersulfone (200 nm) – [emim][TF_2N]	150	RT – 0.19	2.36	20	(12)
PVDF (220 nm) – [emim][Ac]	125	25 – 0.45	2.35	33.7	(16)
PVDF (220 nm) – [bmim][Ac]	125	25 – 0.45	2.28	34.6	(16)
PVDF (220 nm) – [VBTMA][Ac]	125	25 – 0.45	2.95	39	(16)
Ceramic-based IL membranes					
SILM-2.5 (2.5 nm) – [emim][Ac]	0.36*	25 – 1	43.1	31.2	This work
Tubular Al_2O_3/TiO_2 (20 nm) – [emim][Ac]	0.56*	25 – 1	27.8	30.7	(17)
Al_2O_3-Anodisc® (20 nm) – [bmim][PF_6]	60	27 – 0.1	3.91	-	(21)
Tubular Al_2O_3 (20 nm) – [APmim][TF_2N]	1.5	-	~8.20	-	(22)
Al_2O_3-Anodisc® (20 nm) – [bmim][TF_2N]	60	23 – 1.05	1.47	20	(23)
Al_2O_3-Anodisc® (100 nm) – [bmim][TF_2N]	60	23 – 1.05	26.6	20	(23)

*Theoretically estimated according to Morgan's correlation for CO_2 diffusivity in imidazolium-based ILs[44].