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APPENDIX

The experimental fluxes of nitrogen (N_2) and carbon dioxide (CO_2) of the studied mixed matrix membranes are shown in Table A1-Table A13.

Table A1 Silicone rubber coated on polysulfone (SIL-PS)

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	156.76	0.006	0.006	22	1.27E-06	1.13E-08	1.29E-06
	152.97	0.007		22	1.30E-06		
	155.16	0.006		22	1.28E-06		
	154.68	0.006		22	1.29E-06		
	154.42	0.006		22	1.29E-06		
CO_2	14.14	0.071	0.071	22	1.41E-05	6.09E-08	1.40E-05
	14.20	0.070		22	1.40E-05		
	14.23	0.070		22	1.40E-05		
	14.23	0.070		22	1.40E-05		
	14.09	0.071		22	1.41E-05		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	1.29E-06
Permeability of CO_2	1.40E-05
Selectivity of CO_2/N_2	10.92

Table A2 10 wt% Polyethylene glycol/silicone rubber coated on polysulfone (10wt%PEG/SIL MMM)

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	469.49	0.002	0.002	40	2.33E-07	1.8E-09	2.32E-07
	469.17	0.002		40	2.33E-07		
	466.27	0.002		40	2.35E-07		
	472.15	0.002		40	2.32E-07		
	476.25	0.002		40	2.30E-07		
CO_2	13.07	0.077	0.074	40	8.37E-06	1.7E-07	8.13E-06
	13.6	0.074		40	8.04E-06		
	13.35	0.075		40	8.19E-06		
	13.49	0.074		40	8.11E-06		
	13.83	0.072		40	7.91E-06		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	2.32E-07
Permeability of CO_2	8.13E-06
Selectivity of CO_2/N_2	34.96

Table A3 20 wt% Polyethylene glycol/silicone rubber coated on polysulfone (20wt%PEG/SIL MMM)

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	844.44	0.0012	0.0012	41	1.26E-07	5.13E-10	1.26E-07
	850.14	0.0012		41	1.26E-07		
	840.65	0.0012		41	1.27E-07		
	844.59	0.0012		41	1.26E-07		
	846.28	0.0012		41	1.26E-07		
CO_2	16.48	0.0607	0.0600	40	6.64E-06	7.50E-08	6.56E-06
	16.50	0.0606		40	6.63E-06		
	16.85	0.0593		40	6.49E-06		
	16.89	0.0592		40	6.48E-06		
	16.67	0.0600		40	6.56E-06		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	1.26E-07
Permeability of CO_2	6.56E-06
Selectivity of CO_2/N_2	51.95

Table A4 30 wt% Polyethylene glycol/silicone rubber coated on polysulfone (30wt%PEG/SIL MMM)

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	1237.43	0.0008	0.0008	40	8.84E-08	3.74E-10	8.80E-08
	1250.89	0.0008		40	8.75E-08		
	1240.25	0.0008		40	8.82E-08		
	1244.56	0.0008		40	8.79E-08		
	1239.87	0.0008		40	8.82E-08		
CO_2	17.72	0.0564	0.05656	40	6.17E-06	4.49E-08	6.19E-06
	17.85	0.056		40	6.13E-06		
	17.63	0.0567		40	6.21E-06		
	17.70	0.0565		40	6.18E-06		
	17.50	0.0571		40	6.25E-06		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	8.80E-08
Permeability of CO_2	6.19E-06
Selectivity of CO_2/N_2	70.28

Table A5 20 wt% Polyethylene glycol/silicone rubber coated on glycerol treated polysulfone (20wt%PEG/SILgly-P MMM)

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	822.76	0.00122	0.00120	40	1.33E-07	1.66E-09	1.31E-07
	833.24	0.00120		40	1.31E-07		
	831.92	0.00120		40	1.32E-07		
	851.21	0.00117		40	1.29E-07		
	828.72	0.00121		40	1.32E-07		
CO_2	13.68	0.07310	0.07434	38	8.42E-06	1.66E-07	8.56E-06
	13.39	0.07468		38	8.60E-06		
	13.41	0.07457		38	8.59E-06		
	13.08	0.07645		38	8.80E-06		
	13.72	0.07289		38	8.39E-06		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	1.31E-07
Permeability of CO_2	8.56E-06
Selectivity of CO_2/N_2	65.22

Table A6 20 wt% Activated carbon/silicone rubber coated on polysulfone (20wt%Act.C/SIL MMM)

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	50.01	0.0200	0.0201	40	2.19E-06	2.18E-08	2.20E-06
	50.21	0.0199		40	2.18E-06		
	49.86	0.0201		40	2.19E-06		
	48.95	0.0204		40	2.23E-06		
	49.93	0.0200		40	2.19E-06		
CO_2	3.16	0.3165	0.3179	40	3.46E-05	1.18E-06	3.48E-05
	3.09	0.3236		40	3.54E-05		
	3.25	0.3077		40	3.37E-05		
	3.00	0.3333		40	3.65E-05		
	3.24	0.3086		40	3.38E-05		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	2.20E-06
Permeability of CO_2	3.48E-05
Selectivity of CO_2/N_2	15.83

Table A7 10 wt% Polyethylene glycol/20 wt% activated carbon/silicone rubber coated on polysulfone (10wt%PEG/20wt%Act.C/SIL MMM)

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	137.02	0.0073	0.0073	42	7.60E-07	6.71E-09	7.56E-07
	138.54	0.0072		42	7.52E-07		
	139.16	0.0072		42	7.49E-07		
	136.22	0.0073		42	7.65E-07		
	138.50	0.0072		42	7.52E-07		
CO_2	4.18	0.2392	0.2393	40	2.62E-05	3.61E-07	2.62E-05
	4.21	0.2375		40	2.60E-05		
	4.12	0.2427		40	2.66E-05		
	4.26	0.2347		40	2.57E-05		
	4.13	0.2421		40	2.65E-05		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	7.56E-07
Permeability of CO_2	2.62E-05
Selectivity of CO_2/N_2	34.64

Table A8 5 wt% K_2CO_3/15 wt% activated carbon/silicone rubber coated on polysulfone (5wt%K_2CO_3/15wt%Act.C/SIL MMM) at 30%RH

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	535.70	0.0019	0.00185	10	8.17E-07	4.42E-09	8.11E-07
	539.70	0.0019		10	8.11E-07		
	543.96	0.0018		10	8.04E-07		
	538.94	0.0019		10	8.12E-07		
	539.68	0.0019		10	8.11E-07		
CO_2	27.33	0.0366	0.03714	10	1.60E-05	3.34E-07	1.63E-05
	27.10	0.0369		10	1.61E-05		
	26.23	0.0381		10	1.67E-05		
	26.50	0.0377		10	1.65E-05		
	27.52	0.0363		10	1.59E-05		

Permeability of N_2	8.11E-07
Permeability of CO_2	1.63E-05
Selectivity of CO_2/N_2	20.04

[a] Time to reach1 ml (sec)

[b] Flux (ml/sec)

[c] Average flux (ml/sec)

[d] Pressure (psi)

[e] Permeability ($cm^3/(cm^2$-sec-cmHg)

[f] Standard Deviation of permeability

[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Table A9 5 wt% K_2CO_3/15 wt% activated carbon/silicone rubber coated on polysulfone (5wt%K_2CO_3/15wt%Act.C/SIL MMM) at 60%RH

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	542.7	0.00184	0.00186	10	8.06E-07	6.77E-09	8.13E-07
	534.3	0.00187		10	8.19E-07		
	532.42	0.00188		10	8.22E-07		
	540.48	0.00185		10	8.10E-07		
	540.62	0.00185		10	8.09E-07		
CO_2	27.23	0.03672	0.03696	10	1.61E-05	2.77E-07	1.62E-05
	26.93	0.03713		10	1.62E-05		
	27.68	0.03613		10	1.58E-05		
	26.41	0.03786		10	1.66E-05		
	27.05	0.03697		10	1.62E-05		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	8.13E-07
Permeability of CO_2	1.62E-05
Selectivity of CO_2/N_2	19.89

Table A10 5 wt% K_2CO_3/15 wt% activated carbon/silicone rubber coated on polysulfone (5wt%K_2CO_3/15wt%Act.C/SIL MMM) at 70%RH

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	534.90	0.00187	0.00186	10	8.18E-07	5.65E-09	8.16E-07
	537.18	0.00186		10	8.15E-07		
	531.08	0.00188		10	8.24E-07		
	540.22	0.00185		10	8.10E-07		
	539.46	0.00185		10	8.11E-07		
CO_2	27.42	0.03647	0.03659	10	1.60E-05	1.40E-07	1.60E-05
	27.42	0.03647		10	1.60E-05		
	27.49	0.03638		10	1.59E-05		
	27.41	0.03648		10	1.60E-05		
	26.91	0.03716		10	1.63E-05		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability (cm^3/(cm^2-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability (cm^3/(cm^2-sec-cmHg)

Permeability of N_2	8.16E-07
Permeability of CO_2	1.60E-05
Selectivity of CO_2/N_2	19.63

Table A11 10 wt% Polyethylene glycol/5 wt% K_2CO_3/15 wt% activated carbon/silicone rubber coated on polysulfone (10wt%PEG/5wt%K_2CO_3/15wt%Act.C/SIL MMM) at 30%RH

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	615.55	0.00162	0.00162	20	3.55E-07	1.86E-09	3.55E-07
	618.65	0.00162		20	3.54E-07		
	620.87	0.00161		20	3.52E-07		
	614.82	0.00163		20	3.56E-07		
	612.71	0.00163		20	3.57E-07		
CO_2	15.35	0.06515	0.06569	20	1.43E-05	1.76E-07	1.44E-05
	15.39	0.06498		20	1.42E-05		
	14.92	0.06702		20	1.47E-05		
	15.24	0.06562		20	1.44E-05		
	15.22	0.0657		20	1.44E-05		

[a] Time to reach 1 ml (sec)
[b] Flux (ml/sec)
[c] Average flux (ml/sec)
[d] Pressure (psi)
[e] Permeability ($cm^3/(cm^2$-sec-cmHg)
[f] Standard Deviation of permeability
[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	3.55E-07
Permeability of CO_2	1.44E-05
Selectivity of CO_2/N_2	40.50

Table A12 10 wt% Polyethylene glycol/5 wt% K_2CO_3/15 wt% activated carbon/silicone rubber coated on polysulfone (10wt%PEG/5wt%K_2CO_3/15wt%Act.C/SIL MMM) at 50%RH

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	613.28	0.00163	0.00163	20	3.57E-07	1.12E-09	3.56E-07
	614.72	0.00163		20	3.56E-07		
	612.69	0.00163		20	3.57E-07		
	617.54	0.00162		20	3.54E-07		
	615.62	0.00162		20	3.55E-07		
CO_2	15.14	0.06605	0.06608	20	1.45E-05	1.76E-07	1.45E-05
	14.89	0.06716		20	1.47E-05		
	15.38	0.06502		20	1.42E-05		
	15.04	0.06649		20	1.45E-05		
	15.22	0.0657		20	1.44E-05		

Permeability of N_2	3.56E-07
Permeability of CO_2	1.45E-05
Selectivity of CO_2/N_2	40.63

[a] Time to reach 1 ml (sec)

[b] Flux (ml/sec)

[c] Average flux (ml/sec)

[d] Pressure (psi)

[e] Permeability (cm^3/(cm^2-sec-cmHg)

[f] Standard Deviation of permeability

[g] Average permeability (cm^3/(cm^2-sec-cmHg)

Table A13 10 wt% Polyethylene glycol/5 wt% K_2CO_3/15 wt% activated carbon/silicone rubber coated on polysulfone (10wt%PEG/5wt%K_2CO_3/15wt%Act.C/SIL MMM) at 70%RH

Gas	Time[a]	Flux[b]	Ave flux[c]	Pressure[d]	Permeability[e]	Std Dev[f]	Average[g]
N_2	610.31	0.00164	0.001634	20	3.59E-07	9.22E-10	3.58E-07
	612.47	0.00163		20	3.57E-07		
	614.21	0.00163		20	3.56E-07		
	610.57	0.00164		20	3.58E-07		
	611.74	0.00163		20	3.58E-07		
CO_2	15.07	0.06636	0.066102	20	1.45E-05	3.14E-07	1.45E-05
	15.69	0.06373		20	1.39E-05		
	15.01	0.06662		20	1.46E-05		
	14.79	0.06761		20	1.48E-05		
	15.11	0.06618		20	1.45E-05		

[a] Time to reach 1 ml (sec)

[b] Flux (ml/sec)

[c] Average flux (ml/sec)

[d] Pressure (psi)

[e] Permeability ($cm^3/(cm^2$-sec-cmHg)

[f] Standard Deviation of permeability

[g] Average permeability ($cm^3/(cm^2$-sec-cmHg)

Permeability of N_2	3.58E-07
Permeability of CO_2	1.45E-05
Selectivity of CO_2/N_2	40.44

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