

Hydrogen sulfide removal from natural gas using membrane technology: A review

Supplementary Information

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Table S1. H₂S separation performance of polymer membranes and hybrid membranes, the unit of gas permeability is Barrer [1 Barrer = 1×10⁻¹⁰ cm³(STP)·cm·cm⁻²·s⁻¹·cmHg⁻¹].

Membrane	Gas content (%)			Temp. (°C)	Pressure (bar)	H ₂ S permeability (Barrer)	CO ₂ permeability (Barrer)	CH ₄ permeability (Barrer)	H ₂ S/CH ₄ selectivity	CO ₂ /CH ₄ selectivity	H ₂ S/CO ₂ selectivity	Ref.
	H ₂ S	CO ₂	CH ₄									
6FDA-DAM:DABA 3:2	pure	-	-	35	0.7	39.44	-	-	-	-	-	1
	pure	pure	pure	35	1.4	36.65	187.07	4.24	8.64	44.10	0.20	
	pure	-	-	35	2.1	36.38	-	-	-	-	-	
	pure	pure	pure	35	3.4	36.22	167.80	4.02	9.02	41.76	0.22	
	pure	-	-	35	5.2	41.13	-	-	-	-	-	

	pure	pure	pure	35	6.9	50.63	147.89	3.76	13.45	39.28	0.34	
	25	5	70	35	6.9	34.95	82.25	1.94	17.81	42.79	0.42	
	25	5	70	35	13.8	34.75	66.13	1.69	20.26	39.50	0.51	
	25	5	70	35	20.7	39.34	61.74	1.82	21.50	34.23	0.63	
	25	5	70	35	27.6	49.21	66.79	2.20	22.20	30.58	0.73	
	25	5	70	35	48.3	106.25	97.28	4.34	24.50	22.38	1.09	
6FDA-DAM:DABA 1:1	pure	-	-	35	0.7	17.95	-	-	-	-	-	
	pure	pure	pure	35	1.4	18.35	111.45	2.17	8.47	51.46	0.16	
	pure	-	-	35	2.1	17.95	-	-	-	-	-	
	pure	pure	pure	35	3.4	17.09	101.90	1.96	8.71	51.91	0.17	
	pure	-	-	35	5.2	17.80	-	-	-	-	-	
	pure	pure	pure	35	6.9	20.46	90.57	1.82	11.21	49.64	0.23	
	25	5	70	35	6.9	16.60	48.58	0.93	17.55	53.26	0.33	
	25	5	70	35	20.7	16.20	33.33	0.79	20.26	43.03	0.47	
	25	5	70	35	27.6	18.90	33.99	0.84	22.05	41.77	0.53	
	25	5	70	35	48.3	27.97	36.73	1.32	22.56	26.27	0.86	
6FDA-DAM:DABA 1:2	pure	-	-	35	0.7	7.19	-	-	-	-	-	
	pure	pure	pure	35	1.4	6.91	42.80	0.78	8.84	54.71	0.16	
	pure	-	-	35	2.1	7.04	-	-	-	-	-	
	pure	pure	pure	35	3.4	6.36	35.84	0.65	9.83	55.40	0.18	
	pure	-	-	35	5.2	6.48	-	-	-	-	-	
	pure	pure	pure	35	6.9	7.19	32.60	0.64	11.32	51.33	0.22	
	25	5	70	35	6.9	6.73	27.08	0.53	11.85	56.01	0.21	
	25	5	70	35	20.7	7.23	20.06	0.44	16.24	46.08	0.35	

	25	5	70	35	27.6	9.12	15.67	0.42	19.97	42.01	0.48	
	25	5	70	35	48.3	13.01	18.52	0.59	20.55	33.57	0.61	
6FDA-DAM	5	30	65	35	20.0	137.00	167.00	18.50	7.40	9.10	0.81	2
UiO-66/ 6FDA-DAM	5	30	65	35	20.0	352.00	385.00	25.40	13.60	15.20	0.89	
UiO-66-NH ₂ / 6FDA-DAM	5	30	65	35	20.0	224.00	243.00	25.70	8.70	9.50	0.92	
UiO-66-NH-COCH ₃ /6FDA-DAM	5	30	65	35	20.0	172.00	193.00	10.60	16.20	18.20	0.89	
6FDA-DAM	pure	pure	pure	35	1.4	265.56	761.40	32.58	8.43	22.63	0.37	3
	0.5	20	79.5	35	7.0	1083.25	738.17	28.11	38.29	26.42	1.45	
	5	45	50	35	7.0	330.54	581.39	22.64	14.66	25.56	0.57	
	20	20	60	35	7.0	247.47	438.31	16.81	14.54	26.42	0.55	
6FDA-DAM:DABA 3:2	pure	pure	pure	35	1.4	20.35	102.18	2.50	7.94	41.78	0.19	
	0.5	20	79.5	35	7.0	88.02	90.93	1.80	49.04	50.25	0.98	
	5	45	50	35	7.0	27.59	76.61	1.43	19.34	53.22	0.36	
	20	20	60	35	7.0	22.11	58.82	1.14	19.93	50.25	0.40	
pre-aged 6FDA-DAM	0.5	20	79.5	35	7.1	866.13	547.21	18.83	45.99	29.06	1.58	
	0.5	20	79.5	35	14.6	803.75	494.42	17.38	46.24	28.44	1.63	
	0.5	20	79.5	35	20.9	726.21	458.81	16.75	43.37	27.40	1.58	
	0.5	20	79.5	35	28.5	670.31	430.33	15.96	42.00	26.96	1.56	
	0.5	20	79.5	35	34.1	645.72	419.00	15.71	41.11	26.68	1.54	
	20	20	60	35	7.1	206.72	375.96	12.55	16.47	29.95	0.55	
	20	20	60	35	14.6	223.75	288.77	10.62	21.07	27.19	0.77	

	20	20	60	35	20.9	244.33	244.33	9.64	25.34	25.34	1.00	
	20	20	60	35	28.5	278.78	225.73	9.23	30.21	24.46	1.24	
	20	20	60	35	34.1	332.40	230.75	10.86	30.62	21.25	1.44	
	20	20	60	35	46.0	495.99	301.75	15.99	31.02	18.87	1.64	
PIM-1	pure	-	pure	35	1.0	5117.99	-	438.31	11.68	-	-	4
	-	pure	pure	35	2.0	-	5300.34	379.14	-	13.98	-	
	20	20	60	35	14.0	10757.99	4390.75	472.88	22.73	9.29	2.45	
	20	20	60	35	28.0	13843.54	4214.72	517.52	26.90	8.10	3.28	
	20	20	60	35	42.0	15658.57	4424.46	560.56	28.10	7.85	3.54	
	20	20	60	35	56.0	17087.91	4525.58	593.61	28.90	7.59	3.78	
	20	20	60	35	77.0	19697.01	4933.82	652.38	30.26	7.55	3.99	
fresh AO-PIM-1	pure	-	pure	35	1.0	1161.00	-	37.60	30.88	-	-	
	-	pure	pure	35	2.0	-	1078.68	35.39	-	30.48	-	
	20	20	60	35	14.0	2417.43	733.33	48.17	50.18	15.22	3.30	
	20	20	60	35	28.0	2765.83	641.71	42.23	65.39	15.22	4.31	
	20	20	60	35	42.0	3133.59	641.71	44.30	70.59	14.51	4.88	
	20	20	60	35	56.0	3598.12	708.90	48.04	74.99	14.74	5.08	
	20	20	60	35	77.0	4372.34	800.52	59.75	73.47	13.35	5.46	
	20	20	60	35	14.0	2399.63	730.79	47.94	50.05	15.24	3.28	
	20	20	60	35	28.0	2764.51	642.73	42.17	65.56	15.24	4.30	
	20	20	60	35	42.0	-	-	-	70.46	14.53	4.85	
	20	20	60	35	56.0	3606.31	710.24	48.08	75.01	14.77	5.08	
	20	20	60	35	77.0	4412.90	810.97	60.21	73.29	13.47	5.44	
rejuvenated	pure	-	pure	35	1.0	928.81	-	50.30	18.47	-	-	

AO-PIM-1	-	pure	pure	35	2.0	-	1078.68	49.60	-	21.75	-	
	20	20	60	35	14.0	1498.04	546.01	40.46	36.74	13.60	2.74	
	20	20	60	35	28.0	1846.44	509.36	39.69	46.50	12.84	3.63	
	20	20	60	35	42.0	2330.33	570.45	45.62	51.22	12.47	4.09	
	20	20	60	35	56.0	3307.79	647.82	55.35	59.79	11.70	5.11	
	20	20	60	35	77.0	4082.01	812.74	67.59	60.35	12.03	5.02	
AO-PIM-1 after long-term exposure	20	20	60	35	7.0	863.27	352.83	17.44	49.49	20.23	2.45	
	20	20	60	35	28.0	1615.45	395.42	26.88	60.11	14.71	4.09	
	20	20	60	35	56.0	3478.28	667.27	52.81	65.87	12.64	5.21	
	20	20	60	35	77.0	4893.01	841.83	70.61	69.30	11.92	5.81	
CA	pure	pure	pure	35	4.5	4.41	5.05	0.15	28.11	33.23	0.85	5
	20	20	60	35	6.9	3.77	6.11	0.17	21.99	35.49	0.62	
	20	20	60	35	13.8	3.68	5.81	0.17	22.37	34.44	0.65	
	20	20	60	35	34.5	8.71	8.66	0.29	29.70	29.50	1.01	
	20	20	60	35	48.3	39.70	27.50	1.44	27.40	19.10	1.43	
GCV-modified CA	pure	pure	pure	35	4.5	169.73	138.90	4.39	37.67	32.47	1.16	
	20	20	60	35	6.9	118.04	112.61	4.38	27.33	25.39	1.08	
	20	20	60	35	13.8	118.04	97.82	4.12	29.17	23.36	1.25	
	20	20	60	35	34.5	204.00	129.40	5.94	34.30	21.80	1.57	
	20	20	60	35	48.3	190.00	136.00	6.85	27.50	20.00	1.38	
PIM-6FDA-OH	pure	-	pure	35	4.5	33.26	-	4.67	7.12	-	-	6
	15	15	70	35	6.9	24.16	89.00	1.97	12.26	45.17	0.27	
	15	15	70	35	20.7	29.18	59.36	2.00	14.58	29.66	0.49	
	15	15	70	35	34.5	36.00	54.70	1.97	18.30	27.80	0.66	

	15	15	70	35	48.3	63.00	52.60	2.10	30.00	25.00	1.20	
annealed PIM-6FDA-OH	pure	pure	pure	35	2.0	29.85	143.14	4.04	7.40	35.47	0.21	
	pure	-	pure	35	4.0	29.37	-	3.67	8.01	-	-	
	pure	pure	pure	35	7.0	33.99	116.31	3.54	9.61	32.88	0.29	
180 °C annealed 6FDA- DAM:DABA 3:2	pure	pure	pure	35	2.0	29.16	113.30	2.92	10.00	38.85	0.26	7
	pure	pure	pure	35	6.6	44.12	101.38	2.86	15.42	35.43	0.44	
	4.98	-	95.02	35	7.0	35.90	-	2.71	13.24	-	-	
	4.98	-	95.02	35	14.0	34.47	-	2.32	14.89	-	-	
	4.98	-	95.02	35	21.0	32.86	-	2.12	15.51	-	-	
	4.98	-	95.02	35	28.0	31.83	-	2.00	15.93	-	-	
	4.98	-	95.02	35	35.0	32.23	-	1.90	17.00	-	-	
	4.98	-	95.02	35	42.0	30.80	-	1.88	16.41	-	-	
	4.98	-	95.02	35	49.0	30.91	-	1.80	17.20	-	-	
	4.98	-	95.02	35	56.0	30.62	-	1.81	16.96	-	-	
	4.98	-	95.02	35	63.0	31.16	-	1.78	17.50	-	-	
	9.95	19.9	70.15	35	7.0	11.91	64.00	1.31	9.06	48.70	0.19	
	9.95	19.9	70.15	35	14.0	13.59	59.53	1.35	10.03	43.94	0.23	
	9.95	19.9	70.15	35	21.0	15.23	55.72	1.40	10.89	39.83	0.27	
	9.95	19.9	70.15	35	28.0	17.90	54.34	1.49	12.03	36.53	0.33	
	9.95	19.9	70.15	35	42.0	21.66	55.90	1.65	13.10	33.81	0.39	
	9.95	19.9	70.15	35	49.0	25.50	55.81	1.74	14.64	32.04	0.46	
	9.95	19.9	70.15	35	56.0	30.51	60.11	1.94	15.76	31.06	0.51	
	9.95	19.9	70.15	35	63.0	35.76	62.03	2.03	17.64	30.61	0.58	
230 °C annealed 6FDA-	pure	pure	pure	35	2.0	19.74	91.13	2.35	8.40	38.80	0.22	

DAM:DABA 3:2	pure	pure	pure	35	6.6	28.12	87.65	2.28	12.33	38.44	0.32	
	4.98	-	95.02	35	7.0	22.11	-	1.73	12.74	-	-	
	4.98	-	95.02	35	14.0	21.28	-	1.52	14.00	-	-	
	4.98	-	95.02	35	21.0	20.34	-	1.41	14.41	-	-	
	4.98	-	95.02	35	28.0	20.88	-	1.36	15.38	-	-	
	4.98	-	95.02	35	35.0	20.23	-	1.35	14.95	-	-	
	4.98	-	95.02	35	42.0	20.34	-	1.30	15.62	-	-	
	4.98	-	95.02	35	49.0	20.30	-	1.27	15.93	-	-	
	4.98	-	95.02	35	56.0	19.81	-	1.26	15.77	-	-	
	4.98	-	95.02	35	63.0	20.14	-	1.21	16.69	-	-	
	9.95	19.9	70.15	35	7.0	13.51	72.19	1.83	7.38	39.41	0.19	
	9.95	19.9	70.15	35	14.0	14.88	62.84	1.62	9.21	38.88	0.24	
	9.95	19.9	70.15	35	21.0	14.65	58.36	1.50	9.75	38.84	0.25	
	9.95	19.9	70.15	35	28.0	19.07	54.74	1.61	11.83	33.94	0.35	
	9.95	19.9	70.15	35	35.0	20.52	53.08	1.69	12.16	31.46	0.39	
	9.95	19.9	70.15	35	42.0	20.44	51.43	1.66	12.34	31.04	0.40	
	9.95	19.9	70.15	35	49.0	23.62	50.80	1.64	14.42	31.01	0.46	
	9.95	19.9	70.15	35	56.0	26.16	52.37	1.76	14.89	29.80	0.50	
	9.95	19.9	70.15	35	63.0	29.49	53.84	1.86	15.82	28.89	0.55	
uncross-linked PEGME	pure	pure	-	35	4.4	20.43	34.18	-	-	-	0.60	8
	pure	pure	-	35	6.7	27.76	34.18	-	-	-	0.81	
230 °C cross-linked PEGMC	pure	pure	-	35	4.3	18.94	72.85	-	-	-	0.26	
	pure	pure	-	35	6.6	21.55	68.20	-	-	-	0.32	
255 °C	pure	pure	-	35	4.4	21.85	91.71	-	-	-	0.24	

cross-linked PEGMC	pure	pure	-	35	6.7	23.04	84.86	-	-	-	0.27	
280°C	pure	pure	-	35	4.4	21.85	90.06	-	-	-	0.24	
cross-linked PEGMC	pure	pure	-	35	6.7	23.04	85.06	-	-	-	0.27	
6F-PAI-1	pure	pure	pure	35	4.6	6.20	32.80	0.79	8.10	42.00	0.19	9
	10	20	70	35	14.0	3.59	17.06	0.40	8.86	42.13	0.21	
	10	20	70	35	28.0	3.08	11.64	0.35	10.58	33.44	0.32	
	10	20	70	35	42.0	3.55	11.43	0.34	11.97	34.08	0.35	
	10	20	70	35	56.0	3.52	9.50	0.29	10.83	32.34	0.33	
	10	20	70	35	63.0	3.13	9.11	0.29	11.12	31.57	0.35	
6F-PAI-2	pure	pure	pure	35	4.6	3.00	14.20	0.25	10.30	49.00	0.21	
	20	20	60	35	7.0	2.78	9.40	0.25	10.16	37.62	0.27	
	20	20	60	35	14.0	2.90	8.10	0.29	9.25	28.41	0.33	
	20	20	60	35	28.0	4.13	7.58	0.45	7.19	16.96	0.42	
	20	20	60	35	42.0	3.90	7.52	0.54	6.94	13.87	0.50	
	20	20	60	35	56.0	4.32	7.76	0.62	6.57	12.45	0.53	
6F-PAI-3	pure	pure	pure	35	4.6	5.00	21.60	0.46	10.90	47.00	0.23	
6F-PAI-1	pure	pure	pure	35	4.5	6.40	30.00	0.75	8.50	40.00	0.21	10
	5	45	50	35	13.8	10.25	25.95	0.49	21.56	53.05	0.41	
	5	45	50	35	27.6	10.08	23.35	0.50	20.52	46.94	0.44	
	5	45	50	35	41.4	10.51	23.45	0.51	20.45	46.11	0.44	
	5	45	50	35	58.6	11.77	23.60	0.58	20.45	40.88	0.50	
	20	20	60	35	13.8	6.07	20.50	0.46	13.14	44.62	0.29	
	20	20	60	35	27.6	7.19	18.22	0.44	16.27	41.30	0.39	
	20	20	60	35	41.4	9.12	18.05	0.51	18.00	35.33	0.51	

	20	20	60	35	58.6	12.76	19.28	0.60	21.41	32.12	0.67	
6F-PAI-2	pure	pure	pure	35	4.5	2.70	12.00	0.23	12.00	50.00	0.24	
	20	20	60	35	6.9	2.52	10.00	0.25	10.15	40.31	0.25	
	20	20	60	35	13.8	2.64	9.09	0.28	9.45	32.51	0.29	
	20	20	60	35	27.6	3.15	7.08	0.44	7.10	15.95	0.45	
	20	20	60	35	41.4	3.77	6.92	0.53	7.10	13.03	0.55	
	20	20	60	35	55.2	4.10	6.44	0.61	6.70	10.53	0.64	
6F-PAI-3	pure	pure	pure	35	4.5	4.60	21.00	0.43	11.00	48.00	0.23	
Pebax SA01 MV3000	pure	pure	pure	35	1.4	503.57	107.05	10.60	47.52	10.10	4.70	
	pure	pure	pure	35	2.1	563.80	109.93	10.22	55.18	10.76	5.13	
	pure	pure	pure	35	2.8	639.68	112.52	10.35	61.78	10.87	5.68	
	pure	pure	pure	35	3.4	688.19	115.55	10.49	65.59	11.01	5.96	
	pure	pure	pure	35	4.1	742.85	116.71	10.74	69.17	10.87	6.36	
	5	45	50	35	13.8	517.96	135.26	12.78	40.51	10.58	3.83	
	5	45	50	35	27.6	654.42	165.96	18.43	35.52	9.01	3.94	
	20	20	60	35	13.8	675.09	156.57	15.96	42.29	9.81	4.31	
	20	20	60	35	27.6	953.18	215.90	22.92	41.59	9.42	4.41	
	20	20	60	35	41.4	1203.36	276.83	30.45	39.52	9.09	4.35	
	20	20	60	35	55.2	1510.39	348.99	44.00	34.33	7.93	4.33	
(6FDA-mPDA)-(6FDA-durene) (5000/5000 g/gmol)	1 ^a	10	59	22	34.5	7.68	18.57	0.51	15.20	36.74	0.41	11
	10 ^b	10	60	22	34.5	5.15	9.32	0.28	18.35	33.23	0.55	
	20 ^c	10	60	22	34.5	11.15	13.22	0.49	22.78	27.02	0.84	
6FDA-Durene/ CARDO (3:1)	10 ^b	10	60	22	21.0	41.40	42.40	1.95	21.23	21.74	0.98	12
	10 ^b	10	60	22	31.0	40.00	37.20	1.94	20.62	19.18	1.08	

	10 ^b	10	60	22	34.0	42.50	37.50	2.07	20.53	18.12	1.13	
	20 ^d	10	57	22	14.0	47.30	51.40	2.27	20.84	22.64	0.92	
	20 ^d	10	57	22	21.0	40.40	38.10	2.12	19.06	17.97	1.06	
6FDA-Durene/ MDEA (1:3)	20 ^e	10	59	22	27.6	112.00	76.10	5.30	21.13	14.36	1.47	13
6FDA-CARDO/ 6FDA-Durene (2500/2500)	10 ^f	10	59	22	13.8	58.80	77.30	3.20	18.62	24.46	0.76	14
	10 ^f	10	59	22	27.6	62.60	62.50	3.10	20.04	20.00	1.00	
	10 ^f	10	59	22	41.4	65.10	59.50	3.50	18.66	17.04	1.09	
	10 ^f	10	59	22	55.2	83.60	62.30	4.90	17.07	12.72	1.34	
	20 ^d	10	57	22	13.8	103.90	87.20	4.40	23.54	19.75	1.19	
	20 ^d	10	57	22	27.6	104.90	78.00	4.60	22.61	16.82	1.34	
	20 ^d	10	57	22	41.4	153.70	93.60	8.00	19.15	11.66	1.64	
	36 ^g	10	48.6	22	13.8	162.50	100.20	6.60	24.72	15.24	1.62	
	36 ^g	10	48.6	22	27.6	275.80	142.20	13.70	20.08	10.35	1.94	
6FDA-6FpDA/ 6FDA-Durene (4:1)	20 ^e	10	59	22	24.1	24.40	42.00	1.80	13.70	23.60	0.58	15
	20 ^e	10	59	22	34.5	26.40	41.70	2.00	13.10	20.80	0.63	
6FDA-Durene/ 6FDA-CARDO (5000/5000) TFC	10 ^f	10	59	25	24.1	223.00	120.00	11.60	19.30	10.30	1.86	16
	10 ^f	10	59	25	48.3	220.00	122.00	14.50	15.20	8.40	1.80	
6FDA-CARDO	22 ^h	10	55	22	20.7	26.50	26.00	1.16	22.70	22.30	1.02	17
	22 ^h	10	55	22	34.5	38.80	29.80	2.70	14.40	11.00	1.30	
6FDA- CARDO(t-Bu)	22 ^h	10	55	22	20.7	101.00	80.40	5.36	18.90	15.00	1.26	
	22 ^h	10	55	22	34.5	148.00	95.10	9.20	16.10	10.30	1.56	
6FDA-TPA	20 ^e	10	59	22	20.7	54.82	43.73	3.04	18.00	14.40	1.25	18
	20 ^e	10	59	22	34.5	67.08	50.12	3.76	17.80	13.30	1.34	

6FDA-TPA(t-Bu)	20 ^e	10	59	22	20.7	68.14	54.50	3.72	18.30	14.70	1.25	
	20 ^e	10	59	22	34.5	66.02	50.40	4.41	15.00	11.40	1.31	
POz-CF ₃	20 ^e	10	59	22	34.5	41.00	43.10	8.10	5.06	5.32	0.95	19
	20 ^e	10	59	22	48.3	38.80	40.60	7.40	5.24	5.49	0.96	
FPT-Ph(OH)	20 ^e	10	59	22	34.5	136.00	92.00	6.18	22.10	14.90	1.48	
	20 ^e	10	59	22	48.3	119.00	79.80	5.57	21.30	14.30	1.49	
PPG-HDI-BDO	0.0186	-	99.9814	25	20.0	340.00	-	40.00	8.50	-	-	20
	0.0186	-	99.9814	25	30.0	580.00	-	33.00	17.60	-	-	
	0.0186	-	99.9814	25	30.0	780.00	-	38.00	20.50	-	-	
	0.075	-	99.925	25	30.0	850.00	-	31.00	27.40	-	-	
	0.4	2.1	97.5	25	20.0	250.00	195.00	36.00	6.90	5.40	1.28	
	0.4	2.1	97.5	25	30.0	430.00	306.00	34.00	12.60	9.00	1.41	
	0.4	2.1	97.5	35	30.0	680.00	516.00	43.00	15.80	12.00	1.32	
	0.66	2.1	97.24	25	30.0	790.00	473.00	29.00	27.20	16.30	1.67	
P0	5	3	92	25	55.2	4116.01	2695.76	-	6.56	4.30	1.53	21
	20 ^d	10	57	25	55.2	6774.36	5347.47	-	9.56	4.37	1.27	
P1	5	3	92	25	55.2	3082.33	1329.38	-	8.21	3.55	2.32	
	20 ^d	10	57	25	55.2	6468.39	4842.32	-	9.00	3.47	1.34	
P2	5	3	92	25	55.2	1801.01	619.23	-	11.03	3.80	2.91	
	20 ^d	10	57	25	55.2	5857.35	4164.14	-	11.59	3.69	1.41	
P3	5	3	92	25	55.2	2624.84	814.15	-	15.97	5.04	3.22	
	20 ^d	10	57	25	55.2	6329.23	4319.81	-	16.26	4.48	1.47	
P3a	5	3	92	25	55.2	1801.01	638.70	-	17.20	6.20	2.82	
	20 ^d	10	57	25	55.2	5817.68	4057.97	-	17.23	5.14	1.43	

P3b	5	3	92	25	55.2	1358.37	619.23	-	13.48	6.22	2.19	
	20 ^d	10	57	25	55.2	5661.65	4164.14	-	14.69	5.24	1.36	
P4	5	3	92	25	55.2	3480.15	1203.63	-	26.17	9.15	2.89	
	20 ^d	10	57	25	55.2	6989.50	4699.65	-	27.21	7.18	1.49	
P5	5	3	92	25	55.2	1997.48	740.75	-	32.94	12.25	2.70	
	20 ^d	10	57	25	55.2	6151.11	4238.38	-	30.69	8.90	1.45	
P6	5	3	92	25	55.2	1533.70	582.07	-	34.28	13.10	2.63	
	20 ^d	10	57	25	55.2	6151.11	4308.08	-	31.61	9.56	1.43	
P7	5	3	92	25	55.2	3082.33	732.36	-	47.67	11.40	4.21	
	20 ^d	10	57	25	55.2	6904.51	4331.57	-	38.03	7.98	1.59	
PU1	1.3	27.9	70.8	35	10.1	239.00	77.50	11.20	21.00	6.90	3.08	22
	12.5	18.1	69.4	35	10.1	183.00	55.80	8.10	23.00	6.90	3.28	
PU2	1.3	27.9	70.8	35	10.1	613.00	197.00	32.50	19.00	6.10	3.11	
	12.5	18.1	69.4	35	10.1	618.00	195.00	34.70	18.00	5.60	3.17	
PU3	1.3	27.9	70.8	35	10.1	271.00	58.80	4.70	58.00	13.00	4.61	
	12.5	18.1	69.4	35	10.1	280.00	62.20	5.10	55.00	12.00	4.50	
PU4	1.3	27.9	70.8	35	10.1	199.00	44.70	2.70	74.00	17.00	4.45	
	12.5	18.1	69.4	35	10.1	223.00	50.80	3.40	66.00	15.00	4.39	
	1.3	27.9	70.8	20	4.1	95.20	21.00	0.90	106.00	23.00	4.53	
	1.3	27.9	70.8	20	10.1	102.00	22.40	1.00	102.00	22.00	4.55	
	1.3	27.9	70.8	20	13.8	115.00	24.80	1.10	105.00	23.00	4.64	
	12.5	18.1	69.4	20	4.1	104.00	22.00	1.10	95.00	20.00	4.73	
	12.5	18.1	69.4	20	10.1	123.00	25.40	1.30	95.00	20.00	4.84	
	12.5	18.1	69.4	20	13.8	130.00	26.80	1.40	93.00	19.00	4.85	

CA	6	29	65	35	10.1	2.13	2.43	0.11	19.00	22.00	0.88	
Pebax MX 1074	12.5	18.1	69.4	35	10.1	695.00	155.00	13.80	50.00	11.00	4.48	
	1.3	27.9	70.8	35	10.1	553.00	122.00	10.30	54.00	12.00	4.53	
Pebax MX 1657	1.3	27.9	70.8	35	10.1	248.00	69.10	4.90	51.00	14.00	3.59	
Pebax MX 1041	1.3	27.9	70.8	35	10.1	175.00	39.70	3.60	49.00	11.00	4.41	
Pebax 4033 SA00	1.3	27.9	70.8	35	10.1	312.00	84.40	13.00	24.00	6.50	3.70	
Pebax 3533 SA00	1.3	27.9	70.8	35	10.1	888.00	243.00	42.60	21.00	5.70	3.65	
Pebax 6333 SA00	1.3	27.9	70.8	35	10.1	37.80	7.40	1.90	20.00	3.90	5.11	
Pebax 7233 SA00	1.3	27.9	70.8	35	10.1	7.60	4.10	0.50	15.00	8.20	1.85	
cross-linked PEG (200 g mol ⁻¹)	3	5	92	25	55.2	0.07	0.07	0.00	64.45	58.95	1.12	23
cross-linked PEG (300 g mol ⁻¹)	3	5	92	25	55.2	0.24	0.11	0.00	80.95	39.24	2.13	
cross-linked PEG (400 g mol ⁻¹)	3	5	92	25	55.2	0.50	0.20	0.01	93.03	38.02	2.46	
cross-linked PEG (600 g mol ⁻¹)	3	5	92	25	55.2	9.38	2.28	0.09	105.84	26.82	4.12	
cross-linked PEG (1000 g mol ⁻¹)	3	5	92	25	55.2	26.49	5.24	0.24	110.24	22.52	5.05	
cross-linked PEG (2050 g mol ⁻¹)	3	5	92	25	55.2	3.02	0.69	0.03	115.79	27.55	4.37	
PDMS coated PES	1.68	-	98.32	25	10.0	-	-	-	11.04	-	-	24
	1.68	-	98.32	25	30.0	-	-	-	5.20	-	-	
	1.68	-	98.32	35	30.0	-	-	-	3.95	-	-	
	7.5	-	92.5	25	30.0	-	-	-	2.45	-	-	
	0.4	2.1	97.5	25	10.0	-	-	-	10.90	43.87	0.25	
	0.4	2.1	97.5	25	30.0	-	-	-	1.76	3.14	0.56	
	0.4	2.1	97.5	35	30.0	-	-	-	3.18	4.83	0.66	
	0.66	2.1	97.24	25	30.0	-	-	-	1.35	2.95	0.46	
Pebax 2533	pure	pure	pure	30	4.9	102.31	20.59	4.81	21.25	4.28	4.97	25

1% [emim][EtSO ₄]/ Pebax	pure	pure	pure	30	4.9	114.32	25.27	6.65	17.20	3.80	4.52	
3% [emim][EtSO ₄]/ Pebax	pure	pure	pure	30	4.9	244.28	25.72	8.02	30.45	3.21	9.50	
5% [emim][EtSO ₄]/ Pebax	pure	pure	pure	30	4.9	326.46	39.11	9.40	34.73	4.16	8.35	
	pure	pure	pure	30	2.9	130.51	11.70	2.11	42.26	5.54	11.16	
	pure	pure	pure	30	3.9	217.40	22.67	4.28	50.47	5.27	9.59	
	pure	pure	pure	30	4.9	325.66	37.17	7.43	56.01	5.00	8.76	
	pure	pure	pure	30	5.9	433.74	50.06	10.41	58.91	4.82	8.66	
	pure	pure	pure	30	6.9	540.22	54.96	11.95	65.92	4.57	9.83	
10.6 wt.% Y-fum-fcu-MOF/ 6FDA-DAM	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	344.11	895.37	44.34	7.72	20.31	0.38	26
17.8 wt.% Y-fum-fcu-MOF/ 6FDA-DAM	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	411.62	1071.04	49.96	8.23	21.45	0.38	
30.1 wt.% Y-fum-fcu-MOF/ 6FDA-DAM	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	551.43	1382.87	59.78	9.28	23.00	0.40	
9.9 wt.% Y-fum-fcu-MOF/ 6FDA-DABA	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	48.47	222.21	5.89	8.23	37.71	0.22	
17.7 wt% Y-fum-fcu-MOF/	pure ⁱ	pure	pure	35	1.38/ 1.38/	63.08	286.91	7.53	8.46	37.71	0.22	

6FDA-DABA					4.14							
10.1 wt% Y-fum-fcu-MOF/ Pebax	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	727.14	120.28	7.99	90.55	15.15	6.05	
20.0 wt% Y-fum-fcu-MOF/ Pebax	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	869.80	143.88	9.45	90.55	15.47	6.05	
18 wt% Y-fum-fcu-MOF/ 6FDA-DAM	20	20	60	35	7.0	391.90	597.44	19.92	19.68	29.99	0.66	
	20	20	60	35	14.0	354.15	456.92	16.38	21.83	27.64	0.78	
	20	20	60	35	20.5	391.90	381.42	15.79	24.49	24.49	1.03	
	20	20	60	35	28.0	442.24	370.93	16.74	26.56	22.03	1.19	
	20	20	60	35	41.0	624.70	381.42	20.10	30.75	19.18	1.64	
	20	20	60	35	55.0	953.98	490.48	28.86	33.22	16.91	1.94	
6FDA-DAM	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	250.74	738.05	40.37	6.19	18.34	0.34	27
	20	20	60	35	6.9	258.00	414.00	16.91	15.30	24.40	0.62	
NbOFFIVE-1-Ni/ 6FDA-DAM	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	438.85	950.02	45.86	9.58	20.69	0.46	
AIFFIVE-1-Ni/ 6FDA-DAM	pure ⁱ	pure	pure	35	1.38/ 1.38/ 4.14	502.04	1061.84	55.23	9.06	19.30	0.47	
20 wt% NbOFFIVE-1-Ni/	20	20	60	35	6.9	401.00	547.00	19.38	20.70	28.20	0.73	

6FDA-DAM												
20 wt% AIFIVE-1-Ni/ 6FDA-DAM	20	20	60	35	6.9	458.00	599.00	24.90	18.60	23.80	0.76	
[bmim][BF ₄]/ PVDF W _i /W _p =0.5	pure	pure	pure	35	3.0	165.80	36.45	0.93	167.50	34.51	4.55	28
[bmim][BF ₄]/ PVDF W _i /W _p =1.0	pure	pure	pure	35	3.0	460.60	95.11	2.26	201.31	39.54	4.84	
[bmim][BF ₄]/ PVDF W _i /W _p =1.5	pure	pure	pure	35	3.0	771.94	136.47	3.59	214.86	37.61	5.66	
	pure	pure	pure	65	4.0	1060.90	212.85	8.52	122.88	24.49	4.98	
	pure	pure	pure	55	4.0	976.68	189.61	6.13	159.31	30.21	5.15	
	pure	pure	pure	45	4.0	944.01	172.91	5.21	185.06	32.92	5.46	
	pure	pure	pure	35	4.0	899.72	156.94	3.81	240.91	41.36	5.73	
	pure	pure	pure	35	2.0	840.68	162.38	5.50	153.60	29.23	5.18	
	pure	pure	pure	35	3.0	849.41	162.38	4.95	173.47	31.97	5.23	
	pure	pure	pure	35	4.0	859.60	157.28	3.73	231.78	39.57	5.47	
	pure	pure	pure	35	5.0	920.73	153.64	3.68	252.29	42.31	5.99	
[bmim][BF ₄]/ PVDF W _i /W _p =2.0	pure	pure	pure	35	3.0	963.71	186.11	4.92	193.58	36.73	5.18	
[bmim][PF ₆]/ PVDF	pure	pure	pure	40	0.1	1907.00	512.00	63.90	29.84	8.01	3.72	29
[bmim][BF ₄]/ PVDF	pure	pure	pure	40	0.1	4059.00	1104.00	111.00	36.57	9.95	3.68	
	pure	pure	pure	30	0.1	3711.19	1051.86	86.04	43.13	12.23	3.53	
	pure	pure	pure	40	0.1	4061.62	1104.01	110.38	36.80	10.00	3.68	

	pure	pure	pure	50	0.1	4248.25	1282.23	152.98	27.77	8.38	3.31	
	pure	pure	pure	60	0.1	4577.83	1368.29	172.10	26.60	7.95	3.35	
[bmim][Tf ₂ N]/ PVDF	pure	pure	pure	40	0.1	2600.00	1233.00	131.00	19.85	9.41	2.11	
[bmim][CF ₃ SO ₃]/ PVDF	pure	pure	pure	40	0.1	4303.00	1078.00	84.80	50.74	12.71	3.99	
[bmim][Ac]/PVDF	pure	pure	pure	40	0.1	7304.00	2148.00	53.60	136.27	40.07	3.40	
	pure	pure	pure	30	0.1	5284.60	1567.58	36.62	144.32	42.81	3.37	
	pure	pure	pure	40	0.1	7312.95	2140.18	56.03	130.53	38.20	3.42	
	pure	pure	pure	50	0.1	8312.57	2351.26	58.45	142.21	40.22	3.54	
	pure	pure	pure	60	0.1	8695.91	2771.00	85.14	102.13	32.55	3.14	
[bmim][BF ₄]/ MFFK-1	pure	pure	pure	25	1.0	383.00	84.00	12.00	31.92	7.00	4.56	30
	5	-	95	25	1.0	128.60	-	7.90	16.28	-	-	
	5.3	18.2	76.5	25	1.0	142.00	70.00	8.60	16.51	8.14	2.03	
[bmim][OAc]/ MFFK-1	pure	pure	pure	25	1.0	115.00	92.00	6.00	19.17	15.33	1.25	
	5	-	95	25	1.0	205.80	-	2.00	102.90	-	-	
	5.3	18.2	76.5	25	1.0	110.40	100.30	1.00	110.40	100.30	1.10	
	5	-	95	25	1.0	206.33	-	2.43	85.01	-	-	
	5	-	95	30	1.0	271.68	-	4.12	65.99	-	-	
	5	-	95	40	1.0	332.13	-	5.99	55.40	-	-	
	5	-	95	60	1.0	573.41	-	8.81	65.08	-	-	

a The gas mixture consists of 1% H₂S, 10% CO₂, 59% CH₄ and 30% N₂.

b The gas mixture consists of 10% H₂S, 10% CO₂, 60% CH₄ and 20% N₂.

c The gas mixture consists of 20% H₂S, 10% CO₂, 60% CH₄ and 10% N₂.

d The gas mixture consists of 20% H₂S, 10% CO₂, 57% CH₄, 10% N₂ and 3% C₂H₆.

e The gas mixture consists of 20% H₂S, 10% CO₂, 59% CH₄, 10% N₂ and 1% C₂H₆.

f The gas mixture consists of 10% H₂S, 10% CO₂, 59% CH₄, 20% N₂ and 1% C₂H₆.

g The gas mixture consists of 36% H₂S, 10% CO₂, 48.6% CH₄, 4.4% N₂ and 1% C₂H₆.

h The gas mixture consists of 22% H₂S, 10% CO₂, 55% CH₄, 10% N₂ and 3% C₂H₆.

i The pure gas permeability was tested at the partial pressure of the three gases in the 20/20/60% H₂S/CO₂/CH₄ mixture.

Table S2. H₂S separation performance of polymer membranes and hybrid membranes, the unit of gas permeance is GPU [1 Barrer = 1×10⁻⁶ cm³(STP)·cm⁻²·s⁻¹·cmHg⁻¹].

Membrane	Gas content (%)			Temp. (°C)	Pressure (bar)	H ₂ S permeance (GPU)	CO ₂ permeance (GPU)	CH ₄ permeance (GPU)	H ₂ S/CH ₄ selectivity	CO ₂ /CH ₄ selectivity	H ₂ S/CO ₂ selectivity	Ref.
	H ₂ S	CO ₂	CH ₄									
uncross-linked PDMC-CF ₃ HFM	pure	-	-	35	0.7	13.92	-	-	-	-	-	31
	pure	-	-	35	1.4	13.50	-	-	-	-	-	
	pure	-	-	35	2.1	13.50	-	-	-	-	-	
	pure	-	-	35	3.4	14.93	-	-	-	-	-	
	pure	-	-	35	5.2	15.98	-	-	-	-	-	
	pure	-	-	35	6.9	18.46	-	-	-	-	-	
	0.5	20	79.5	35	6.9	39.23	36.72	0.95	41.49	38.84	1.07	
	0.5	20	79.5	35	13.8	33.31	33.10	0.95	35.23	35.01	1.01	
	0.5	20	79.5	35	20.7	30.31	30.22	0.88	34.57	34.46	1.00	
	0.5	20	79.5	35	31.0	27.84	27.15	0.88	31.65	30.87	1.03	
	25	5	70	35	6.9	10.97	26.35	0.76	14.35	34.46	0.42	
	25	5	70	35	13.8	11.17	23.41	0.71	15.77	33.03	0.48	
	25	5	70	35	20.7	11.98	22.85	0.74	16.15	30.81	0.52	
	25	5	70	35	31.0	15.32	23.98	0.90	17.11	26.80	0.64	
	20	20	60	35	6.9	15.21	30.21	0.78	19.40	38.52	0.50	
	20	20	60	35	13.8	14.72	26.41	0.76	19.46	34.91	0.56	

	20	20	60	35	20.7	15.03	24.66	0.78	19.28	31.64	0.61	
cross-linked PDMC-CF ₃ HFM	pure	-	-	35	0.7	13.86	-	-	-	-	-	
	pure	-	-	35	1.4	13.27	-	-	-	-	-	
	pure	-	-	35	2.1	13.04	-	-	-	-	-	
	pure	-	-	35	3.4	13.52	-	-	-	-	-	
	pure	-	-	35	5.2	13.98	-	-	-	-	-	
	pure	-	-	35	6.9	15.24	-	-	-	-	-	
	0.5	20	79.5	35	6.9	46.51	47.55	1.23	37.94	38.79	0.98	
	0.5	20	79.5	35	13.8	41.10	43.10	1.15	35.72	37.46	0.95	
	0.5	20	79.5	35	20.7	37.84	39.44	1.14	33.10	34.49	0.96	
	0.5	20	79.5	35	31.0	31.18	34.85	1.06	29.43	32.89	0.89	
	25	5	70	35	6.9	12.54	33.78	0.96	13.07	35.20	0.37	
	25	5	70	35	13.8	11.98	28.33	0.91	13.15	31.09	0.42	
	25	5	70	35	20.7	12.09	25.79	0.87	13.97	29.80	0.47	
	25	5	70	35	31.0	12.43	24.20	0.90	13.80	26.88	0.51	
	20	20	60	35	6.9	13.50	32.55	0.80	16.81	40.53	0.41	
	20	20	60	35	13.8	13.22	27.95	0.79	16.71	35.33	0.47	
	20	20	60	35	20.7	13.14	25.64	0.79	16.61	32.40	0.51	
	20	20	60	35	31.0	13.54	23.30	0.83	16.32	28.08	0.58	
uncross-linked, non-pt, TEGMC	pure	-	-	35	1.0	34.10	-	-	-	-	-	32
	pure	-	-	35	1.7	33.65	-	-	-	-	-	
	pure	-	-	35	3.1	32.75	-	-	-	-	-	
	pure	-	-	35	4.5	43.52	-	-	-	-	-	
	pure	-	-	35	5.2	47.87	-	-	-	-	-	

	pure	pure	-	35	6.2	67.64	102.69	-	-	-	0.66	
cross-linked, non-pt, TEGMC	pure	-	-	35	1.7	11.39	-	-	-	-	-	
	pure	-	-	35	3.1	10.98	-	-	-	-	-	
	pure	-	-	35	4.5	13.81	-	-	-	-	-	
	pure	pure	-	35	6.2	16.08	45.81	-	-	-	0.35	
	pure	-	pure	35	7.2	17.66	-	0.52	34.11	-	-	
	5	45	50	35	6.9	11.69	23.82	0.59	19.73	40.21	0.49	
	5	45	50	35	20.7	9.49	18.51	0.64	14.89	29.05	0.51	
	5	45	50	35	34.5	9.73	17.76	0.80	12.22	22.31	0.55	
	5	45	50	35	48.3	9.96	16.56	0.85	11.66	19.39	0.60	
	20	20	60	35	6.9	18.24	43.33	0.97	18.80	44.66	0.42	
	20	20	60	35	13.8	11.88	31.83	0.83	14.29	38.29	0.37	
	20	20	60	35	20.7	10.87	25.63	0.75	14.44	34.04	0.42	
	20	20	60	35	27.6	11.41	23.79	0.84	13.56	28.26	0.48	
	20	20	60	35	34.5	11.95	21.78	0.84	14.23	25.92	0.55	
cross-linked, PDMS pt, TEGMC	pure	-	-	35	1.7	13.53	-	-	-	-	-	
	pure	-	-	35	3.1	12.74	-	-	-	-	-	
	pure	-	-	35	4.5	12.65	-	-	-	-	-	
	pure	pure	-	35	6.2	13.81	32.96	-	-	-	0.42	
	pure	-	pure	35	7.2	15.48	-	1.02	15.11	-	-	
	5	45	50	35	6.9	11.18	24.15	0.48	23.54	50.84	0.46	
	5	45	50	35	20.7	10.24	19.38	0.36	28.83	54.59	0.53	
	5	45	50	35	34.5	9.75	17.03	0.33	29.53	51.58	0.57	
	5	45	50	35	48.3	9.83	16.28	0.35	27.82	46.05	0.60	

	20	20	60	35	6.9	20.12	42.58	0.91	22.00	46.56	0.47	
	20	20	60	35	13.8	13.62	30.77	0.68	20.08	45.36	0.44	
	20	20	60	35	20.7	12.40	24.77	0.57	21.66	43.27	0.50	
	20	20	60	35	27.6	11.80	21.57	0.55	21.43	39.18	0.55	
	20	20	60	35	34.5	11.76	19.55	0.52	22.76	37.84	0.60	
PPO	0.0101	-	99.9899	22.5	3.5	4.63	-	0.95	4.86	-	-	33
	0.0101	-	99.9899	22.5	5.2	5.91	-	0.98	6.00	-	-	
	0.0101	-	99.9899	22.5	6.9	6.15	-	1.01	6.12	-	-	
	0.0101	-	99.9899	40	6.9	8.64	-	1.47	5.87	-	-	
	0.0198	-	99.9802	22.5	3.5	5.83	-	0.95	6.12	-	-	
	0.0198	-	99.9802	22.5	5.2	6.56	-	0.98	6.66	-	-	
	0.0198	-	99.9802	22.5	6.9	7.15	-	1.01	7.08	-	-	
	0.0198	-	99.9802	40	6.9	9.18	-	1.36	6.77	-	-	
	0.0401	-	99.9599	22.5	3.5	7.56	-	0.95	7.98	-	-	
	0.0401	-	99.9599	22.5	5.2	7.36	-	0.98	7.51	-	-	
	0.0401	-	99.9599	22.5	6.9	7.31	-	1.01	7.24	-	-	
	0.0401	-	99.9599	40	6.9	10.17	-	1.59	6.41	-	-	
	0.0968	-	99.9032	20	3.5	4.95	-	2.54	1.95	-	-	
	0.0968	-	99.9032	20	5.2	5.43	-	2.04	2.66	-	-	
	0.0968	-	99.9032	20	6.9	6.58	-	2.38	2.76	-	-	
	0.0968	-	99.9032	40	3.5	4.84	-	3.22	1.50	-	-	
	0.0968	-	99.9032	40	5.2	6.66	-	3.03	2.19	-	-	
	0.0968	-	99.9032	40	6.9	9.16	-	2.90	3.16	-	-	
	0.3048	-	99.6952	20	3.5	16.04	-	2.57	6.23	-	-	

	0.3048	-	99.6952	20	5.2	14.26	-	2.47	5.77	-	-	
	0.3048	-	99.6952	20	6.9	12.58	-	2.43	5.18	-	-	
	0.3048	-	99.6952	40	3.5	24.85	-	3.37	7.37	-	-	
	0.3048	-	99.6952	40	5.2	19.05	-	3.03	6.29	-	-	
	0.3048	-	99.6952	40	6.9	16.39	-	2.97	5.52	-	-	
	0.5008	-	99.4992	20	3.5	16.96	-	2.54	6.68	-	-	
	0.5008	-	99.4992	20	5.2	8.93	-	2.46	3.62	-	-	
	0.5008	-	99.4992	20	6.9	10.48	-	2.42	4.32	-	-	
	0.5008	-	99.4992	40	3.5	20.12	-	3.23	6.22	-	-	
	0.5008	-	99.4992	40	5.2	16.14	-	3.23	4.99	-	-	
	0.5008	-	99.4992	40	6.9	12.61	-	2.99	4.22	-	-	
PEUU	0.5008	-	99.4992	23	3.5	1.71	-	0.08	21.55	-	-	
	0.5008	-	99.4992	23	5.2	1.51	-	0.10	14.39	-	-	
	0.5008	-	99.4992	23	6.9	0.94	-	0.11	8.49	-	-	
CTA HFM	20 ^a	5	68.99	35	6.9	83.89	87.28	3.21	26.11	27.16	0.96	³⁴
	20 ^a	5	68.99	35	13.8	90.25	86.72	3.21	28.09	26.99	1.04	
	20 ^a	5	68.99	35	20.7	101.69	90.53	3.68	27.64	24.61	1.12	
	20 ^a	5	68.99	35	31.3	144.21	113.42	5.09	28.34	22.29	1.27	
	20 ^a	5	68.99	50	6.9	103.84	103.27	5.80	17.90	17.80	1.01	
	20 ^a	5	68.99	50	13.8	109.49	99.18	5.54	19.76	17.90	1.10	
	20 ^a	5	68.99	50	20.7	114.57	99.18	5.77	19.84	17.17	1.16	
	20 ^a	5	68.99	50	31.3	133.22	105.96	6.43	20.70	16.47	1.26	
	20 ^b	5	68.97	35	6.9	75.16	79.79	3.36	22.38	23.76	0.94	
	20 ^b	5	68.97	35	13.8	86.81	81.30	3.39	25.63	24.00	1.07	

	20 ^b	5	68.97	35	20.7	100.61	87.69	3.66	27.51	23.98	1.15	
	20 ^b	5	68.97	35	31.3	130.46	100.85	4.70	27.75	21.45	1.29	
	20 ^b	5	68.97	50	6.9	109.39	98.22	5.21	21.01	18.87	1.11	
	20 ^b	5	68.97	50	13.8	113.14	95.35	5.18	21.82	18.39	1.19	
	20 ^b	5	68.97	50	20.7	121.36	101.17	5.80	20.93	17.45	1.20	
	20 ^b	5	68.97	50	31.3	138.92	118.73	7.24	19.18	16.39	1.17	
PEUU	0.6	6.2	93.2	35	10.0	53.65	37.91	2.39	22.45	15.86	1.42	35
	0.6	6.2	93.2	35	20.0	38.15	34.31	2.59	14.72	13.24	1.11	
	0.6	6.2	93.2	35	30.0	47.14	34.70	2.67	17.64	12.99	1.36	
	0.6	6.2	93.2	45	10.0	96.50	45.53	3.58	26.99	12.73	2.12	
	0.6	6.2	93.2	45	20.0	60.50	43.26	3.65	16.56	11.84	1.40	
	0.6	6.2	93.2	45	30.0	60.50	38.18	3.34	18.12	11.44	1.58	
	0.6	6.2	93.2	55	10.0	143.95	59.14	4.42	32.56	13.38	2.43	
	0.6	6.2	93.2	55	20.0	69.21	55.27	5.56	12.44	9.94	1.25	
	0.6	6.2	93.2	55	30.0	76.62	45.38	5.12	14.96	8.86	1.69	
	3	5.4	91.6	35	10.0	127.48	34.48	3.00	42.56	11.51	3.70	
	3	5.4	91.6	35	20.0	94.78	34.86	3.67	25.81	9.50	2.72	
	3	5.4	91.6	35	30.0	92.01	34.48	3.45	26.70	10.00	2.67	
	3	5.4	91.6	45	10.0	134.59	45.34	4.52	29.79	10.04	2.97	
	3	5.4	91.6	45	20.0	102.38	46.56	5.69	17.98	8.18	2.20	
	3	5.4	91.6	45	30.0	85.99	41.87	5.31	16.18	7.88	2.05	
	3	5.4	91.6	55	10.0	239.90	58.37	5.56	43.17	10.50	4.11	
	3	5.4	91.6	55	20.0	114.93	55.43	7.65	15.03	7.25	2.07	
	3	5.4	91.6	55	30.0	78.87	40.38	6.51	12.12	6.20	1.95	

PDMS coated PES	1.68	-	98.32	25	10.0	32.80	-	2.97	11.04	-	-	24
	1.68	-	98.32	25	30.0	16.38	-	3.15	5.20	-	-	
	1.68	-	98.32	35	30.0	12.71	-	3.21	3.95	-	-	
	7.5	-	92.5	25	30.0	7.79	-	3.18	2.45	-	-	
	0.4	2.1	97.5	25	10.0	28.86	116.07	2.64	10.90	43.87	0.25	
	0.4	2.1	97.5	25	30.0	5.51	9.85	3.14	1.76	3.14	0.56	
	0.4	2.1	97.5	35	30.0	9.34	14.19	2.94	3.18	4.83	0.66	
	0.66	2.1	97.24	25	30.0	4.16	9.06	3.07	1.35	2.95	0.46	

a The gas mixture consists of 20% H₂S, 5% CO₂, 68.99% CH₄, 3% C₂H₆ and 0.01% C₃H₈.

b The gas mixture consists of 20% H₂S, 5% CO₂, 68.97% CH₄, 3% C₂H₆ and 0.03% C₃H₈.

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