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Metal and porous organic frameworks	Polymer	Loading (wt%)	H_2 permeability (Barrer)		H_2 polymer selectivity			H_2 MMM selectivity			Reference
			Polymer	MMM	H_2/CO_2	H2/N_2	H_2/CH_4	H_2/CO_2	H_2/N_2	H_2/CH_4	
Cubic MOF-5	Cellulose Acetate	12	4.3	14.9	1.1			1.78			1
Tetragonal MOF-5	Cellulose Acetate	12	4.3	13.9	1.1			1.79			1
ZIF-L	Polyimide	20	219.7	260.4	1.8	40	70.4	13.4	41.4	61.6	2
CAU-1-NH_2	Poly(methyl methacrylate)	15	5000	11000	3			13			3
$[Cu_2(ndc)_2(dabco)]_n$	Polybenzimidazole	20	3.61	6.13	9.5			26.7			4
MIL-53(Al)-NH_2	Poly(methyl methacrylate)	20	1.53E-09	1.09E-08	7.64			53.12			5
MIL-53(Al)-NH_2	Polyimide	20	5.26E-09	2.40E-08	6.49			44.61			5
ZIF-7	Polyetherimide	5	856.1	207	10.4	39.2	46.6	3.2	53.9	41.8	6
Postsynthetic modified ZIF-7	Polyetherimide	5	856.1	2020.9	10.4	39.2	46.6	8.2	11.1	18.7	6
UiO-66-NH_2	6FDA-DAM	40	684	1810	0.82	12.9	14.2	0.73	10.1	9.7	7
UiO-66-NH_2	6FDA-DAM:DABA(3:2)	55	180	2932	1.02	23.4	32.7	1.17	23.8	34.4	7
UiO-66-NH_2	6FDA-BPDA-DAM(1:1)	40	364	1086	0.75	15	13.9	0.81	12.8	11.6	7
ZIF-L-Zn	Troger's base polymer	20	300	897.5	2	50	50	1.9	25	23	8

ZIF-L-Co	Troger's base polymer	20	300	1235.5	2	50	50	2.2	27	25	8
ZIF-L	Polyimide	20	219.7	260.4	1.8	40	70.4	13.4	41.4	61.6	9
ZIF-7-I	6FDA-DAM	3	589.2	921.4	1.36	30.6	40.2	2.3	36.1	67.4	10
ZIF-7-mix	6FDA-DAM	7	589.2	478.3	1.36	30.6	40.2	4.1	31.7	85.5	10
ZIF-7-III	6FDA-DAM	10	589.2	322	1.36	30.6	40.2	4.4	59.5	172.2	10
ZIF-8	Matrimid 5218	20	30	450		85	105		82	95	11
ZIF-8 dopamine	Matrimid 5218	20	30	70		85	105		95	120	11
ZIF-8	Polyimide	20	390	1443	1.4	33	48	1.6	26	34	12
Polydopamine coated ZIF-8	Polyimide	20	390	1156	1.4	33	48	1.6	30	39	12
UiO-66(Hf)-(OH)2	Polybenzimidazole	10	3.61	8.12	9.1			19.37			13
ZIF-8	Polysulfone	10	37.4	87	2.18	47.9	45.5	2.38	65.9	63	14
UiO-66	Polysulfone	32	11	70			60			62	15
UiO-66	Polyimide	8	30	70			133			150	15
ZIF-8	6FDA-BI	20	33.4	78.5	3.7	104.3	278.2	3.9	100.6	224	16
ZIF-8	6FDA-BI	30	33.4	174	3.7	104.3	278.2	3.4	73.1	140.9	16
ZIF-8	Matrimid 5218	20	28.7	44.7	2.9	92.4	124.5	3.3	126.3	87.1	17
Palladium@ZIF-8	Matrimid 5218	20	28.7	68.9	2.9	92.4	124.5	5.1	201.1	135.9	17
ZIF-8	Matrimid 5218	40	66.66	71.22	3.03	95.14	120.8	2.96	67.43	80.77	18
ZIF-8	Matrimid 5218	50	66.66	18.1	3.03	95.14	120.8	3.82	107.1	471.88	18
UZAR-S13	6FDA-DAM	10	505	544			7.2			12.7	19
UZAR-S13	6FDA-DAM	10	505	597			7.2			8.9	19
ZIF-11	6FDA-DAM	20	21.4	272.45	1.03		33.96	1.06		32.82	20
ZIF-90	6FDA-triptycene	50	59	179	3	60	113	2.8	58	101	21
ZIF-8	PIM-1	28	3300	10650	0.26	6.6	4.5	0.62	9.8	7.4	22

ZIF-8	PIM-1	43	3300	14430	0.26	6.6	4.5	0.75	8.2	5.4	22
ZIF-8	Polybenzimidazole	15	3.7	28.5	8.6			13			23
ZIF-8	Polybenzimidazole	30	3.7	105.4	8.6			12.3			23
ZIF-8	Polybenzimidazole	10	65	107	17.6			16.1			24
ZIF-7	Polyetherimide	30	6.63	7.82	5.1			7.4			25
ZIF-7	Polyetherimide	40	6.63	8.95	5.1			8.4			25
ZIF-8	Matrimid 5218	10	30.3	46.3	3.18	43.3	94.68	2.98	79.8	102.8	26
ZIF-11	Matrimid 5218	30	17.33	102.8	4.12		66.65	3.21		140.82	27
ZIF-11	Matrimid 5218	40	17.33	28.36	4.12		66.65	2.83		189.1	27
ZIF-12	Polyetherimide	30	9	39.77	5.44		183.46	6.16		331.41	28
ZIF-8	Thermally rearranged polymer-30	20	194	414		31.2	44		35.4	49.4	29
ZIF-8	Thermally rearranged polymer-50	20	273	440		26.5	39.5		30	54.4	29
UiO-66-$(OH)_2$	6FDA-DAM:DABA(3:2)	40	191	497		24.6	35.9		25.8	37	30
UiO-66-$(OH)_2$	6FDA-DAM:DABA(3:2)	50	191	906.5		24.6	35.9		29.1	45	30

Mixed linker ZIF-8	Torlon	16	1.85	4.92		24.3	31.5		278	302	31
ZIF-8	Torlon	15	1.85	2.6		24.3	31.5		25.2	193	31
CAU-21-ODB	PIM-1	15.2	3420	7300		8			39		32
MIL-140A	Polyvinyl alcohol	4	491	959	3.8			6.3			33
ZIF-8-polydopamine	Troger's base polymer	40	200	542.6			50			45	34
ZIF-8-polydopamine	Troger's base polymer	50	200	664.1			50			37.7	34
ZIF-8	6FDA Durene	33.3	518.5	2136.6	1.1	14.9	17.9	1.4	16	15.3	35
NH2-MIL-53(Al)	Polyimide	30	15	384.1	6			16.7			36
HKUST-1 (solution mixing)	Cyclic olefin copolymer	40	10.48	19.42	24.4			34.1			37
MIL-53(Al) (solution mixing)	Cyclic olefin copolymer	40	10.48	16.68	24.4			31.5			37
MIL-53(Al) (melt processing)	Cyclic olefin copolymer	40	10.48	15.18	24.4			31			37
$Zn_2(bim)_4$	PIM-1	10	670	1358		10.46	6.56		10.52	7	38
MOF-74	PIM-1	10	670	1682		10.46	6.56		14.75	10.78	38
TIFSIX	PIM-1	4	670	1010		10.46	6.56		19.4	14.22	38
MIL-53	PIM-1	4	670	1027		10.46	6.56		18.33	13.7	38
MIL-101	Carbon nanofiber	5	1.50E-08	2.10E-08	6.6	6.6		2.4	2.3		39
MIL-101-NH_2	Carbon nanofiber	5	1.50E-08	2.50E-07	6.6	6.6		21.9	21.5		39
MIL-101-$PhSO_3H$	Carbon nanofiber	5	1.50E-08	1.81E-08	6.6	6.6		8.3	8.3		39

MIL-101-COOH	Carbon nanofiber	5	1.50E-08	8.50E-08	6.6	6.6		12.7	8.5		39
ZIF-7	Polybenzimidazole	25	3.70E+00	1.54E+01	8.7			11.9			40
ZIF-7	Polybenzimidazole	50	3.70E+00	2.62E+01	8.7			14.9			40
ZIF-7	Polybenzimidazole	50	2.90E+00	1.33E+01	7.1			7.2			40
ZIF-8-NH_2	6FBDA co-polyimide	40	24.7	96.1	1.76	45.8	85.2	1.75	108.1	141.3	41
ZIF-8-NH_2	6FBDA co-polyimide	50	24.7	127.5	1.76	45.8	85.2	1.57	128.8	141.7	41
MUF-15	PIM-1	15	4200	8500		6.5			5.8		42
MUF-15	PIM-1	5	4200	5500		6.5			7		42
ZIF-11	Polybenzimidazole	20	50	128	4.5			4.9			43
ZIF-93	Polybenzimidazole	20	50	267	4.5			5.8			43
ZIF-93/ZIF-11	Polybenzimidazole	20	50	207	4.5			7.7			43
ZIF-8	Matrimid 5218	25	28	31	3.5			3.5			44
ZIF-90	Matrimid 5218	25	28	30	3.5			5			44
ZIF-90-ethylenediamine	Matrimid 5218	25	28	19	3.5			9.5			44
ZIF-8	Polyimide	45	1534	8332	0.9	11.4	12.6	1.7	9.8	10.3	45
ZIF-8-IPD	Polyimide	25	1534	2684	0.9	11.4	12.6	1.4	13.1	15.3	45
ZIF-8-IPD	Polyimide	45	1534	7982	0.9	11.4	12.6	1.9	13	15.1	45

ZIF-8	6FDA-DAM:DABA(3:2)	10	156	251	1.66134		60.8	1.44253		51.7	46
ZIF-8-90(30)	6FDA-DAM:DABA(3:2)	10	156	301	1.66134		60.8	1.60963		55.7	46
ZIF-8-90(50)	6FDA-DAM:DABA(3:2)	10	156	276	1.66134		60.8	1.58621		58.3	46
ZIF-8-90(70)	6FDA-DAM:DABA(3:2)	10	156	250	1.66134		60.8	1.64474		62	46
ZIF-90	6FDA-DAM:DABA(3:2)	10	156	219	1.66134		60.8	1.79508		70.7	46
Zn^{2+} treated 20 wt% ZIF-8	6FDA-BI	20	33.4	72.3	3.7	104.3	278.2	4.5	120.5	318.3	47
Etched ZIF-8	Polyimide-COOH	40	538	1837.8	1.5	20.3	23.4	1.8	24.7	37.2	48
Etched ZIF-8	Polyimide-COOH	50	538	3058.6	1.5	20.3	23.4	2.1	30.7	37.6	48
ZIF-8	DMBP-TB	30	293	1180		38.2	35.3		22.9	21.5	49
UiO-66-NH_2	DMBP-TB	30	293	758		38.2	35.3		30.8	27.2	49
MIL-101(Cr)	DMBP-TB	30	293	628		38.2	35.3		35.9	31.1	49
ZIF-7-NH_2	PIM-1	30	1072.3	1337.2			17.8			30.9	50
ZIF-7-NH2/PIM-COOH	PIM-1	30	1072.3	1529.1			17.8			55.3	50
ZIF-7-NH2/PIM-COOH (annealed 2h)	PIM-1	30	1072.3	1977.2			17.8			92.1	50

ZIF-67@BNNS-0.2	Polyetherimide	1	1.78	5.33	2.97			5.54			51
Pd@ZIF-67 gel	PIM-1	28	3177	3620			4.8			24.9	52
ML-ZIF-8	Torlon	16	1.85	4.92		24.3	31.5		278	302	53
NUS-2	Polyetherimide	20	6.45	22.5	3.21		64.5	5.8		187.5	54
	Polybenzimidazole	20	3.61	4.08	9.5			31.4			54
NUS-3	Polyetherimide	20	6.45	33.2	3.21		64.5	2.39		67.75	54
	Polybenzimidazole	20	3.61	12.2	9.5			8.91			54
TpPa-1	PBI-BuI	40	6.22	18.8	2.7	69.1	155.5	3.8	78.9	165.5	55
TpBD		50	6.22	42.4	2.7	69.1	155.5	2.9	66	139.7	55
Porous aromatic framework (PAF)-1	Triptycene PIM-2	5	1651	2907		19.5	16		27	24.2	56
Porous aromatic framework (PAF)-1	Triptycene PIM-2	5	1175	1335		38.7	35.2		78	77.8	56
porous graphitic framework (PGF-1)	6FDA-DAM:DABA(3:2)	6	192.1	421.4	1.43	31.5	48.6	1.4	30	49.7	57
HOF-30	Matrimid 5218	10	55.8	428.1			23.25	23.2		61.7	58

Zeolites	Polymer	Loading (wt%)	H_2 permeability (Barrer)		H_2 polymer selectivity			H_2 MMM selectivity			Reference
			Polymer	MMM	H_2/CO_2	H_2/N_2	H_2/CH_4	H_2/CO_2	H_2/N_2	H_2/CH_4	
Zeolite 3A	Polysulfone	40	16.4	15.1	1.53			3.57			59
Zeolite 3A	Polysulfone	50	16.4	17.2	1.53			3.54			59
Zeolite 4A	PDMS	40	1313	9516	0.23		0.73	3.41		11.6	60
DDR Zeolite	Matrimid 5218	20	17	34.9			129.9			375.3	61
DDR Zeolite	Matrimid 5218	22	17	36.4			129.9			187.8	61
Zeolite 4A	Polyvinyl acetate	25	7	3.8		100			156		62
Zeolite 13X	Matrimid 5218	30	14.8	178	4.03	77.1		2.34	74.8		63
Zeolite 4A	Matrimid 5218	30	14.8	83	4.03	77.1		2.03	58.5		63
ZSM-5	Matrimid 5218	20	14.8	147	4.03	77.1		1.89	67.5		63
Silanated zeolite-4A	Polyvinyl acetate	15	5.84	5.55	4.71	95.74		6.12	143.04		64
Zeolite-4A	Polyvinyl acetate	30	5.84	5.3	4.71	95.74		6.1	139.47		64
Carbon-impregnated zeolite	P84 co-polyimide	1	10	20		51	50		59.49	58.14	65
SIlicalite-1	Matrimid 5218	10	30.3	28.3	3.18	43.3	94.68	2.98	78.6	94.3	26
SAPO-34	Matrimid 5218	10	30.3	25.2	3.18	43.3	94.68	3.3	86.8	105.4	26
Mesoporous ZSM-5	Matrimid 5218	10	17.5	22.23	2.4	79.6	83.3	2.39	142.6	160.9	66

ZSM-5	Matrimid 5218	10	17.5	22.04	2.4	79.6	83.3	2.45	64.8	73.5	66
MCM-48	Matrimid 5218	10	17.5	23.14	2.4	79.6	83.3	2.47	76.1	82.6	66
Modified Sodalite	PIM-1	7	2659.8	3620		4.52			9.29		67
Hollow zeolite sphere	Polysulfone	8	11.8	15.4			58.9			80.3	68
Hollow zeolite sphere	Polyimide	8	30.4	38.4			132			180	68
Zeolite 4A	Polycarbonate	20	15.3	13.4	1.73	57.2	40.9	1.7	66.3	55.8	69
Zeolite 4A	Polycarbonate	30	15.3	13.1	1.73	57.2	40.9	1.87	73.2	70.4	69
Sodalite	Polyetherimide	10	13.5	7556		4.3			17.3		70

graphite- and graphene-based materials	Polymer	Loading (wt%)	H_2 permeability (Barrer)		H_2 polymer selectivity			H_2 MMM selectivity			Reference
			Polymer	MMM	H_2/CO_2	H_2/N_2	H_2/CH_4	H_2/CO_2	H_2/N_2	H_2/CH_4	
Graphite oxide	Polysulfone	8	11	5			60			30	71
Graphite oxide	Polyimide	8	30	15			133			80	71
Graphite oxide	Matrimid 5218	0.1	22	28	2.75	50	50	2.8	68	68	72
Graphite oxide	Matrimid 5218	0.2	22	27	2.75	50	50	3.4	68	68	72
Thermally reduced graphite oxide	Matrimid 5218	0.1	22	22	2.75	50	50	2.75	90	90	72
Thermally reduced graphite oxide	Matrimid 5218	0.2	22	22	2.75	50	50	2.75	70	230	72
Ascorbic acid multiphase rGO	Matrimid 5218	0.1	22	24	2.75	50	50	4	110	230	72
Ascorbic acid multiphase rGO	Matrimid 5218	0.2	22	25	2.75	50	50	2.78	70	180	72
GO	PEBAX	0.01	13.5	12		4.82	1.8		4.28	2	73
GO	PEBAX	0.04	13.5	6		4.82	1.8		6	3	73
GO	PEBAX	0.1	9.9	10.8	0.1	4.5	2	0.1	5.9	1.67	74

GO	PEBAX	0.2	9.9	11	0.1	4.5	2	0.125	5.5	1.6	74
GO	PEBAX	0.5	9.9	12.5	0.1	4.5	2	0.16	5.9	1.8	74
GO-IL	PEBAX	0.1	9.9	10.5	0.1	4.5	2	0.08	5.5	1.8	74
GO-IL	PEBAX	0.2	9.9	10.4	0.1	4.5	2	0.07	5.78	1.66	74
GO-IL	PEBAX	0.5	9.9	10.3	0.1	4.5	2	0.09	6.86	1.6	74

Other and/or composite fillers	Polymer	Loading (wt%)	H_2 permeability (Barrer)		H_2 polymer selectivity			H_2 MMM selectivity			Reference
			Polymer	MMM	H_2/CO_2	H_2/N_2	H_2/CH_4	H_2/CO_2	H_2/N_2	H_2/CH_4	
Graphite oxide - UiO-66	Polysulfone	8	11	15			60			70	75
Graphite oxide - UiO-66	Polyimide	4	30	40			133			155	75
Graphite oxide - UiO-66	Polyimide	32	30	60			133			130	75
Pd nanoparticles	Polybenzimidazole	58	26	33	15			40			76
Mesoporous silica sphere	6FDA-DAM	8	480	686			16.5			20	77
Mg-mesoporous silica sphere	6FDA-DAM	16	480	918			16.5			21.7	77
Mg-mesoporous silica sphere	6FDA-DAM	8	480	794			16.5			21.8	77

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