Protic Ionic Liquids: Evolving Structure-Property Relationships and Expanding Applications

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Table S1. Thermal phase behaviour of PILs, including the glass transition (T_g), melting point (T_m), boiling point (T_b) and decomposition temperature (T_d). All temperatures are in ^oC.

Protic Ionic Liquid	Water (wt%)	T_g	T_m	T_b	T_d	Ref
-ammonium						
ammonium nitrate	<1		163.5	223.8		[57]
ammonium formate	<1		120			[57]
ammonium HF_2	<1		125.6		240	[57]
ammonium HSO_4	<1	-65.6	116.3			[57]
ammonium H_2PO_4	<1	-23.3	193.3			[57]
ammonium TfO	<1				225	[57]
methylammonium nitrate	0.40	[f]	111		269[a], 277[a]	[46]
methylammonium nitrate			110.5-11.5			[608]
methylammonium nitrate	<1		104.7	206.8		[57]
methylammonium formate	0.42	-114	13			[45]
methylammonium formate	<1	-108.2	-21.7	162.1		[57]
methylammonium TFA	0.45	[f]	61	249		[46]
methylammonium HSO_4	0.48	[f]	93	258	352, 362	[46]
methylammonium HSO_4	<1		73.2		302.3	[57]
methylammonium HF_2	<1	-104.1	-11.8	174.5		[57]
methylammonium H_2PO_4	<1	-28.8	96.8		254.2	[57]
methylammonium CH_3SO_3	<1		91		260.2	[57]
methylammonium BF_4	<1		77.1			[57]
methylammonium PO_3F	<1	47.8				[57]
ethylammonium nitrate	0.22		9			[45]
ethylammonium nitrate	<1	-91.5	13	240		[57]
ethylammonium formate	0.38	-106	-15			[45]
ethylammonium formate	<1	-127.5	-72.9	176.1		[57]
ethylammonium acetate	0.12		87			[45]
ethylammonium acetate	180 ppm				167	[609]
ethylammonium propionate	0.42	-94				[45]
ethylammonium butyrate	0.26	-88				[45]
ethylammonium octanoate	1.31	-96	-4			[104]
ethylammonium glycolate	0.50	-67				[45]

ethylammonium lactate	0.85	-57				[45]
ethylammonium pivalate	0.20	[f]	122	132	174	[46]
ethylammonium TFA	0.51	[f]	58	253		[46]
ethylammonium heptafluorobutyrate	0.51	[f]	59		207	[104]
ethylammonium pentadecafluorooctanoate	0.61	[f]	58		203	[104]
ethylammonium triflate			179		372	[272]
ethylammonium TfO	<1		172.1			[57]
ethylammonium TfO	<1		172.1		312.1	[57]
ethylammonium HSO_4		-64.1	39.7		262	[272]
ethylammonium HSO_4	<1	-96.4	31.9			[57]
ethylammonium HSO_4	0.31	-84	40			[45]
ethylammonium CH_3SO_3			137		230	[272]
ethylammonium CH_3SO_3	<1		112.5		288.6	[57]
ethylammonium H_2PO_4	0.38		134			[45]
ethylammonium H_2PO_4	<1	-31.3	109.5			[57]
ethylammonium HF_2	<1	-100.3	3.5	176.4		[57]
ethylammonium BF_4	<1		152.4			[57]
ethylammonium perchlorate	<1		151.9			[57]
propylammonium nitrate			4.0			[610]
propylammonium formate	0.61		50			[45]
propylammonium formate	<1	-124.7	-55.4	213.1		[57]
propylammonium formate	6753 ppm				103	[60]
propylammonium acetate	150				177	[609]
propylammonium acetate	5436 ppm	-26			113	[60]
propylammonium HSO_4	<1		33.9		304.5	[57]
propylammonium H_2PO_4	<1		145.6		315.3	[57]
butylammonium formate	0.32	-95	2			[45]
butylammonium formate	<1	-120.1	-46.8	224.5		[57]
butylammonium octanoate	0.51	-94	-15			[104]
butylammonium heptafluorobutyrate	0.41	-126	53		208	[104]
butylammonium pentadecafluorooctanoate	0.55	[f]	45		204	[104]
butylammonium thiocyanate			20.5		190	[610]
butylammonium Tf_2N	<1		16.2		352	[611]
butylammonium HSO_4	<1	-63.4	33.5		307.9	[57]
butylammonium H_2PO_4	<1	-33.3	113.3		275.7	[57]
butylammonium CH_3SO_3	<1	-89.6	131.8		292.2	[57]
butylammonium BF_4	<1		198.2		310.5	[57]
butylammonium PO_3F	<1	-50.1				[57]
sec-butylammonium thiocyanate			22		200	[610]
tert-butylammonium TfO	<1		11.6		243.4	[57]
tert-butylammonium HSO_4	<1		130.6		243.9	[57]
tert-butylammonium BF_4	<1		118.3		243.6	[57]
pentylammonium formate	0.26	-93	12			[45]
N-dodecylammonium alkylbenene sulfonate (alkyl chain of 15-20 carbons)					201	[585]
N-octadecylammonium alkylbenene sulfonate (alkyl chain of 15-20					202	[585]

carbons)						
dodecylammonium type S-(1-carboxylpropyl)-N,N-diethyldithiocarbamate			72		182	[584]
dodecylammonium type S-(1-carboxylpropyl)-N,N-dibutyldithiocarbamate			72		184	[584]
dodecylammonium type S-(1-carboxylpropyl)-N,N-dioctyldithiocarbamate			73		189	[584]
dimethylammonium nitrate	0.42	[f]	80		210 [a]	[46]
dimethylammonium nitrate	<1		75			[57]
dimethylammonium nitrate			75.5-76.5			[608]
dimethylammonium formate	0.41	-114	-13	150-180		[46]
dimethylammonium formate	<1			152		[57]
dimethylammonium HSO_4	0.56	-97	-21	348		[46]
dimethylammonium HSO_4	<1		40.1		310.9	[57]
dimethylammonium HF_2	<1	-111	-22.9	178.4		[57]
dimethylammonium H_2PO_4	<1	-36.8	117.3			[57]
dimethylammonium CH_3SO_3	<1	-95	122.1		278	[57]
dimethylammonium PO_3F	<1	-51.5				[57]
diethylammonium nitrate			104-105			[608]
diethylammonium formate	0.44	-109	4	126	194	[46]
diethylammonium formate	1.79	f	f		86	[58]
diethylammonium formate	50-125 ppm		35.8			[16]
diethylammonium acetate	50-125 ppm	-62.1	47.5			[16]
diethylammonium acetate	0.14	-92	-18		53	[58]
diethylammonium triflate			125		362	[272]
diethylammonium HSO_4	-67.1		60.5		262	[272]
diethylammonium HSO_4	<1		77.3		301.5	[57]
diethylammonium CH_3SO_3	-67.8		31.4		185	[272]
diethylammonium $HPHO_3$					161	[272]
diethylammonium H_2PO_4					140	[272]
diethylammonium hydrogen phosphate	0.42		120			[45]
diethylammonium heptafluorobutyrate	0.15	-81	45		196	[104]
diethylammonium di-*n*-butylphosphate	50-125 ppm	-89.9	-6.8			[16]
diethylammonium MsOH	50-125 ppm		45.1			[16]
diethylammonium sulfamate	225-275 ppm					[16]
diethylammonium saccharin	50-125 ppm	-22.2	77.9			[16]
diethylammonium sulfate	0.31	-64	~200			[45]
di-*n*-propylammonium formate	2.06	f	-28		57	[58]
di-*n*-propylammonium acetate	0.18	f	13		35	[58]
di-n-propylammonium thiocyanate			5.5		180	[610]
dipropylammonium PO_3F	<1	-31.5				[57]

di-*n*-butylammonium formate	0.81	f	-1.3		63	[58]
di-*n*-butylammonium acetate	0.14	f	f		59	[58]
dibutylammonium formate	50-125 ppm	-76.6	27.8			[16]
dibutylammonium formate		-120				[612]
dibutylammonium formate	<1	-116.4		234.7		[57]
dibutylammonium acetate	50-125 ppm		45.0			[16]
dibutylammonium MsOH	50-125 ppm	-46.9	72.4			[16]
dibutylammonium Tf_2N	<1		42.6		325	[611]
dibutylammonium HSO_4	<1		130.9		283.5	[57]
dibutylammonium H_2PO_4	<1	-15.6	98			[57]
dibutylammonium CH_3SO_3	<1	-49	42.7		331.9	[57]
dibutylammonium BF_4	<1		212.8		330.1	[57]
dibutylammonium PO_3F	<1	-39.5	75.7			[57]
dibutylammonium di-*n*-butylphosphate	50-125 ppm		63.4			[16]
dibutylammonium sulfamate	225-275 ppm	-38.9	87			[16]
dibutylammonium saccharin	50-125 ppm	-24.7	88.3			[16]
trimethylammonium HSO_4	<1		72.9		308.9	[57]
trimethylammonium PO_3F	<1	-44.5				[57]
triethylammonium nitrate			113-114			[608]
triethylammonium formate	50-125 ppm					[16]
triethylammonium acetate	0.42	-93	-18		48	[58]
triethylammonium acetate	50-125 ppm					[16]
triethylammonium Tf_2N			-0.8			[274]
triethylammonium Tf_2N	<1		3.5		350	[611]
triethylammonium TfO			34.3		358	[272]
triethylammonium TfO	<1				312.5	[57]
triethylammonium HSO_4			74.7		270	[272]
triethylammonium HSO_4	<1	100.1	84.2		262.8	[57]
triethylammonium CH_3SO_3	-62.1		17.4		225	[272]
triethylammonium CH_3SO_3	<1	-96.5	21.6		269.7	[57]
triethylammonium triflate	< 2 mol %				322 [h]	[276]
triethylammonium OMs	< 2 mol %				218 [h]	[276]
triethylammonium H_2PO_4	-27.8				175	[272]
triethylammonium HPHO3	-78.4				135	[272]
triethylammonium H_2PO_4	<1	-34.4				[57]
triethylammonium di-*n*-butylphosphate	50-125 ppm	-91.0				[16]
triethylammonium MsO	50-125 ppm	-78.9	24.3			[16]
triethylammonium sulfamate	225-275 ppm					[16]

triethylammonium saccharin	50-125 ppm	-27.4	72.0			[16]
triethylammonium BF_4	<1		104.3		286.7	[57]
triethylammonium PO_3F	<1	-59.7				[57]
triethylammonium hfipOSO$_3$			42			[110]
tripropylammonium BF_4	<300 ppm		25		250 [c]	[61]
tripropylammonium PO_3F	<1	-56.60	30			[57]
tributylammonium nitrate			21.5		120	[610]
tributulammonium nitrate		-7	19		100 [e]	[103]
tributylammonium formate	50-125 ppm					[16]
tributylammonium acetate	50-125 ppm					[16]
tributulammonium Tf_2N			40		220 [e]	[103]
tributulammonium Tf			128		200 [e]	[103]
tributylammonium triflate			128		353	[272]
tributulammonium CH_3SO_3		2	76		120 [e]	[103]
tributylammonium CH_3SO_3	-69.4		41		254	[272]
tributylammonium MsOH	50-125 ppm	-25.5	70.8			[16]
tributylammonium di-*n*-butylphosphate	50-125 ppm	82.9				[16]
tributylammonium HSO_4	-56		73		254	[272]
tributylammonium HSO_4	<1	-57.1	86.6		250.3	[57]
tributylammonium $HPHO_3$	-60				150	[272]
tributylammonium H_2PO_4	-6.5				150	[272]
tributylammonium PO_3F	<1	-59.1				[57]
tributylammonium hfipOSO$_3$			81			[110]
tributylammonium sulfamate	225-275 ppm					[16]
tributylammonium saccharin	50-125 ppm					[16]
trihexylammonium triflate	-83		-1.0		361	[272]
trihexylammonium HSO_4	-62.1		28.8		247	[272]
trihexylammonium CH3SO3					266	[272]
trihexylammonium HPHO3	-59.8				158	[272]
triehexylammonium H2PO4	-24.3				167	[272]
trioctylammonium triflate		-88	51		371	[108]
ethanolammonium nitrate	0.72	-82	51			[45]
ethanolammonium nitrate	<1	-87.4	-25.2	255.4		[57]
ethanolammonium formate	0.55	-85				[45]
ethanolammonium formate	<1	-88.3				[57]
ethanolammonium acetate	0.47	-67				[45]
ethanolammonium lactate	0.51	-53				[45]
ethanolammonium glycolate	0.17	-52	106			[45]
ethanolammonium octanoate	0.60		33			[104]
ethanolammonium HSO_4	0.62	-88		310	320	[46]
ethanolammonium pivalate	0.72	[f]	103	211		[46]
ethanolammonium TFA	0.34	[f]	89	247		[46]
ethanolammonium methylsulfate	0.48	-44	99			[45]
ethanolammoniun BF_4	<1		0.5			[57]
ethanolammonium TfO	<1	-66	74.8			[57]

ethanolammonium heptafluorobutyrate	0.50	-58	41		195	[104]
2-propanolammonium formate	0.45	-64				[45]
3-propanolammonium formate	7124 ppm	-24			140	[60]
3-propanolammonium acetate	7538 ppm	-26			136	[60]
3-propanolammonium TFA	7482 ppm	-28			184	[60]
diethanolammonium nitrate	0.42	[f]	72		245 [a]	[46]
diethanolammonium nitrate	0.24	f	69		238	[58]
diethanolammonium formate	0.60	-78		182	295	[46]
diethanolammonium formate	0.54	-87	f		114	[58]
diethanolammonium formate	50-125 ppm	-71.9				[16]
diethanolammonium acetate	0.20	-61	55		57	[58]
diethanolammonium acetate	50-125 ppm	-58.5				[16]
diethanolammonium chloride	0.62	-86	-26		89	[58]
diethanolammonium sulfamate	0.94	-62	f		221	[58]
diethanolammonium H_2PO_4	0.46	-35	64		206	[58]
diethanolammonium HSO_4	0.66	-65	f		190	[58]
diethanolammonium methanesulfonate	0.12	-66	48		280	[58]
diethanolammonium MsOH	50-125 ppm	-62.2	29.0			[16]
diethanolammonium di-*n*-butylphosphate	50-125 ppm	-1.4	28.8			[16]
diethanolammonium sulfamate	225-275 ppm	-56.9				[16]
diethanolammonium saccharin	50-125 ppm					[16]
triethanolammonium nitrate	0.32	[f]	80		260,272 [a]	[46]
triethanolammonium formate	50-125 ppm	-52.4	63.3			[16]
triethanolammonium formate	0.91	f	65		88	[58]
triethanolammonium formate	0.44	[f]	67	197	260	[46]
triethanolammonium acetate	50-125 ppm	-58.6	48.4			[16]
triethanolammonium acetate	0.08	-59	47		74	[58]
triethanolammonium saccharin	50-125 ppm					[16]
triethanolammonium MsOH	50-125 ppm	-78.6	69.9			[16]
triethanolammonium sulfamate	225-275 ppm					[16]
triethanolammonium HSO_4	0.55	-63 [d]	53	170	258, 318	[46]
triethanolammonium di-*n*-butylphosphate	50-125 ppm	-59.7	43.2			[16]
dimethylethylammonium Tf_2N		-42	66		377	[272]
dimethylethylammonium triflate	-117		41.6		360	[272]
dimethylethylammonium HSO_4	-75.9				271	[272]
dimethylethylammonium formate	<1	-		187.4		[57]

		121.1				
dimethylethylammonium HSO_4	<1	-91.4	3.3		302.6	[57]
dimethylethylammonium CH_3SO_3	<1		94.7		295.8	[57]
diethylmethylammonium triflate			-13.1		360	[272]
diethylmethylammonium triflate	< 2 mol %				342 [h]	[276]
diethylmethylammonium HSO_4	-82.1				268	[272]
diethylmethylammonium CH_3SO_3	-72.2		10.6		180	[272]
diethylmethylammonium $HPHO_3$	-84.6				137	[272]
diethylmethylammonium H_2PO_4	-37.9				175	[272]
diethylmethylammonium MsO	< 2 mol %				229 [h]	[276]
diethylmethylammonium Tf_2N		-67	24		375	[272]
2-methylpropylammonium formate	0.71	-92	26			[45]
2-methylbutylammonium formate	0.64	-95	-1			[45]
3-methylbutylammonium formate	0.41	-90	47			[45]
methylbutylammonium BF_4	<1		77.1		350.3	[57]
methylbutylammonium HSO_4	<1	-79.6	42.2		285.8	[57]
ethylbutylammonium formate	<1	-119.6		207.3		[57]
ethylbutylammonium HSO_4	<1		54.4		295.1	[57]
methoxyethylammonium TfO	<1				283.5	[57]
methoxyethylammonium formate	<1	-103	-22.4	209.1		[57]
methoxyethylammonium BF_4	<1				206.9	[57]
methoxyethylammonium CH_3SO_3	<1		62.6		282.4	[57]
methoxyethylammonium H_2PO_4	<1	-20.3	90.5		278.6	[57]
methoxypropylammonium formate	<1	-116.4				[57]
methoxypropylammonium nitrate	<1	-82.7				[57]
N,N-diethylmethylammonium TfO	< 100 ppm		−6 [j]		360 [j]	[98]
N–allyldimethylammonium TfO	< 100 ppm		16 [j]		361 [j]	[98]
N,N-dimethylpropylammonium TfO	< 100 ppm		20 [j]		363 [j]	[98]
N-allyldiethylammonium TfO	< 100 ppm	-99 [j]	−14 [j]		358 [j]	[98]
N,N-diethylpropylammonium TfO	< 100 ppm		−14 [j]		359 [j]	[98]
N,N-diallylmethylammonium TfO	< 100 ppm	-88 [j]	−19 [j]		344 [j]	[98]
N-methyldipropylammonium TfO	< 100 ppm		17 [j]		354 [j]	[98]
diphenylammonium TFSA	<1		51.5		193	[611]
2-(2-hydroxy-ethoxy)-ethyl-ammonium formate	0.66	-78		143	189	[46]
2-(2-hydroxy-ethoxy)-ethyl-ammonium nitrate	0.34	-79		278		[46]
2-(2-hydroxy-ethoxy)-ethyl-ammonium HSO_4	0.54	-70		185	320	[46]
2-(2-hydroxy-ethoxy)-ethyl-ammonium TFA	0.71	-64		242	272	[46]

2-methoxy-ethyl-ammonium formate	0.58	-98		130	174, 244	[46]
2-methoxy-ethyl-ammonium nitrate	0.71	-49	37		202 [a],220 [a]	[46]
2-hydroxy-1,1-bis-hydroxymethyl-ethylammonium formate	0.68	[f]	109	182	250,286	[46]
2-hydroxy-1,1-bis-hydroxymethyl-ethylammonium nitrate	0.44	-42	60		240 [a]	[46]
diisopropylmethylammonium formate		-94			>380	[64]
diisopropylmethylammonium acetate		-101			>380	[64]
diisopropylmethylammonium hydrogenebisfluoride		-75			90	[64]
diisopropylethylammonium formate		-103			>380	[64]
diisopropylethylammonium acetate		-106			>380	[64]
diisopropylethylammonium hydrogenebisfluoride		-55			90	[64]
diisopropylethylammonium heptanoate	50 ppm				397	[65]
diisopropylethylammonium octanoate	50 ppm				400	[65]
diisopropylethylammonium TFA			92-93			[613]
triphenylammonium triflate		4	125		292	[108]
tris-(2-hydroxyethyl)ammonium 4-chlorophenylsulfanylacetate			90-92			[435]
1-methylhexylammonium benzoate			91			[433]
1-methylhexylammonium salicylate		-40				[433]
1-methylhexylammonium 5-hydroxysalicylate			121			[433]
bis(2-methoxyethyl)ammonium formate	~100 ppm	-85.31	4.6			[278]
bis(2-methoxyethyl)ammonium acetate	~100 ppm	-82.65	5.9			[278]
glycine nitrate					145-147	[608]
aniline nitrate					182-184	[608]
benzylammonium nitrate			137.5-138.5			[608]
alanine methyl ester formate	0.69	-61	58	150	241	[115]
alanine methyl ester acetate	0.83	-42	[d]	263	316	[115]
alanine methyl ester glycolate	0.18	-48	[d]	180	308	[115]
alanine methyl ester lactate	0.73	-50	38	189	302	[115]
alanine ethyl ester nitrate	0.44	-70	[d]		251 [a]	[115]
alanine ethyl ester formate	0.85	-71	[d]	150	209	[115]
alanine ethyl ester acetate	0.61	[f]	[d]		123, 272	[115]
alanine ethyl ester glycolate	0.62	-48	[d]	180	307	[115]
alanine ethyl ester lactate	0.49	-59	45	182	310	[115]
glycine ethyl ester nitrate	0.52	-52	50		201 [a], 215 [a]	[115]
glycine ethyl ester formate	0.72	-79	[d]	150	267	[115]
glycine ethyl ester acetate	0.85	-69	[d]		100-300 [b]	[115]
glycine ethyl ester glycolate	0.26	-42 [b]	60	174		[115]
glycine ethyl ester lactate	0.17	-42	[d]	185	252	[115]
phenylalanine ethyl ester nitrate	0.17	[f]	141		248 [a]	[115]
phenylalanine ethyl ester formate	0.45	-48	57	142	323	[115]
phenylalanine ethyl ester acetate	0.53	[f]	66	161	253, 300	[115]
phenylalanine ethyl ester glycolate	0.51	[f]	79	180	117, 341	[115]
phenylalanine ethyl ester lactate	0.77	[f]	90	182	311, 362	[115]
proline methyl ester nitrate	0.35	-64	[d]		194 [a]	[115]

proline methyl ester formate	0.74	-75	[d]	268		[115]
proline methyl ester acetate	0.70	-90	[d]	157	283	[115]
proline methyl ester glycolate	0.74	-54	[d]	176	326	[115]
proline methyl ester lactate	0.76	-58	[d]	285		[115]
HNC (dma) Tf_2N			52		297 [c]	[112]
HNC (dma) BETI			32		302 [c]	[112]
TMGH octylNCO_2			75			[614]
TMGH butylNCO_2			55			[614]
TMG BzNCO_2			60			[614]
1,1,3,3-tetramethylguanidinium TFA			42.0		312.58	[615]
1,1,3,3-tetramethylguanidinium perchlorate			33.2		189.37	[615]
1,1,3,3-tetramethylguanidinium TfO			41.0		353.87	[615]
1,1,3,3-tetramethylguanidinium formate			67.0		151.04	[615]
1,1,3,3-tetramethylguanidinium lactate			<-50		190.98	[615]
2TMGH hexdiNCO_2			135			[614]
2TMGH tris(2-ethylNCO_2amine)			57			[614]
amantadinium benzoate			256			[433]
amantadinium salicylate			216			[433]
amantadinium 5-hydroxysalicylate			250			[433]
verapamil hydrochloride			149			[438]
procainamide hydrochloride		43	169			[616]
carvedilol phosphate		78				[440]
procaine hydrochloride		43				[440]
lidocaine hydrochloride			72			[156,437]
acetamide trifluoroacetate (ATFA)	0.47 wt%	-69			75	[114]
acetamide acetate (ATAA)	0.22 wt%	-39	-3		83	[114]
acetamide sulfate (ATSA)		-66			170	[114]
isobutyramide trifluoromethanesulfonate	< 0.1		20.9		207.4	[106]
n-butyramide trifluoromethanesulfonate	< 0.1		27.0		216.0	[106]
ethyldiammonium di-*n*-butylphosphate	50-125 ppm	-70.4	-18.3			[16]
ethyldiammonium formate	50-125 ppm	-85.7				[16]
ethyldiammonium acetate	50-125 ppm	-71.1				[16]
ethyldiammonium MsOH	50-125 ppm	-82.4	54.9			[16]
ethyldiammonium sulfamate	225-275 ppm					[16]
ethyldiammonium saccharin	50-125 ppm	-64.6				[16]
N-butylethylenediaminium Tf_2N	0.01-0.02		33.9			[161]
N-hexylethylenediaminium Tf_2N	0.01-0.02		15.5			[161]
N-2-ethylhexylethylenediaminium Tf_2N	0.01-0.02	-70				[161]

N-octylethylenediaminium Tf_2N	0.01-0.02		18.0			[161]
N-decylethylenediaminium Tf_2N	0.01-0.02		18.2			[161]
N-dodecylethylene-diaminium Tf_2N	0.01-0.02		29.8			[161]
$[n\text{-}Bu(Me)_2N(CH_2)_3NH_3]^{2+}[Tf_2N]_2$			-30.7			[102]
2-fluoropyridinium TfO	<1		58.3			[57]
hydronium TfO	<1		27.4	212.7		[57]
hydronium H_2PO_4	<1		21	158		[57]
triethylenetetramine acetate			125			[444]
-imidazolium						
imidazolium Tf_2N	<1		73.0		379	[611]
imidazolium BF_4	<1		131.2		363.2	[57]
imidazolium CF_3SO_3	<1		122.9			[57]
imidazolium TfO	<1		122.9	308.4		[57]
1-methylimidazolium heptafluorobutyrate	0.32		79			[104]
1-methylimidazolium pentadecafluorooctanoate	0.85		86			[104]
1-methylimidazolium nitrate	<0.5		70			[617]
1-methylimidazolium formate	0.08	-99				[618]
1-methylimidazolium acetate	0.03	-98	-23			[618]
1-methylimidazolium chloride	<0.5		72			[617]
1-methylimidazolium bromide	<0.5	-60	41			[617]
1-methylimidazolium BF_4	<0.5		37			[617]
1-methylimidazolium BF_4			36.9			[619]
1-methylimidazolium BF_4	<1		35.8		387	[57]
1-methylimidazolium perchlorate	<0.5		157			[617]
1-methylimidazolium PF_6	<0.5	-4	116			[617]
1-methylimidazolium TfO	<0.5		84			[617]
1-methylimidazolium TfO	<1	45.8	92		323.5	[57]
1-methylimidazolium Tf_2N	<0.5	-84	9			[617]
1-methylimidazolium BETI	<0.5	-73	11			[617]
1-methylimidazolium hydrogen sulfate		-99			320	[620]
1-methylimidazolium $H_2PO_3^-$		-70	47		122	[620]
1-methylimidazolium $H_2PO_4^-$		57	137		164	[620]
1-methylimidazolium $H_3PO_7^-$		-40			197	[620]
1-methylimidazolium TFA			51			[618]
1-methylimidazolium $hfipOSO_3$			34			[110]
1-ethylimidazolium nitrate	<0.5		31			[617]
1-ethylimidazolium triflate	< 2 mol %				349 [h]	[276]
1-ethylimidazolium OMs	< 2 mol %				252 [h]	[276]
1-ethylimidazolium chloride	<0.5	-57	58			[617]
1-ethylimidazolium bromide	<0.5		60			[617]
1-ethylimidazolium BF_4	<0.5	-87				[617]
1-ethylimidazolium perchlorate	<0.5	-81	21			[617]
1-ethylimidazolium PF_6	<0.5	-62				[617]
1-ethylimidazolium TfO	<0.5		8			[617]
1-ethylimidazolium Tf_2N	<0.5	-89				[617]
1-ethylimidazolium BETI	<0.5	-86				[617]

1-ethylimidazolium HSO_4^-		-75			200	[620]
1-ethylimidazolium $H_2PO_3^-$		-76	53		129	[620]
1-ethylimidazolium $H_2PO_4^-$		-49	80		168	[620]
1-ethylimidazolium $H_3PO_7^-$		-42			212	[620]
1-butylimidazolium Tf_2N			117		390	ref in [272]
1-butylimidazolium triflate	< 2 mol %				346 [h]	[276]
1-butylimidazolium OMs	< 2 mol %				243 [h]	[276]
1-methyl-2-methylimidazolium nitrate	<0.5		84			[617]
1-methyl-2-methylimidazolium chloride	<0.5	-86	181			[617]
1-methyl-2-methylimidazolium bromide	<0.5		176			[617]
1-methyl-2-methylimidazolium BF_4	<0.5	-97				[617]
1-methyl-2-methylimidazolium perchlorate	<0.5	-3	64			[617]
1-methyl-2-methylimidazolium PF_6	<0.5		115			[617]
1-methyl-2-methylimidazolium TfO	<0.5		119			[617]
1-methyl-2-methylimidazolium Tf_2N	<0.5	-79	22			[617]
1-methyl-2-methylimidazolium BETI	<0.5		15			[617]
1-methylbenzimidazolium BF_4			99.9			[619]
1-ethyl-2-methylimidazolium nitrate	<0.5		75			[617]
1-ethyl-2-methylimidazolium chloride	<0.5		178			[617]
1-ethyl-2-methylimidazolium bromide	<0.5		144			[617]
1-ethyl-2-methylimidazolium BF_4	<0.5	-88				[617]
1-ethyl-2-methylimidazolium BF_4	<1	-88				[57]
1-ethyl-2-methylimidazolium perchlorate	<0.5	-76	7			[617]
1-ethyl-2-methylimidazolium PF_6	<0.5	-42				[617]
1-ethyl-2-methylimidazolium TfO	<0.5		33			[617]
1-ethyl-2-methylimidazolium Tf_2N	<0.5	-84				[617]
1-ethyl-2-methylimidazolium BETI	<0.5		-19			[617]
N-ethyl-2-methylimidazolium $hfipOSO_3$		-53	-3			[110]
N-butyl-2-methylimidazolium $hfipOSO_3$		-52	31			[110]
1-benzyl-2-ethylimidazolium nitrate	<0.5	-31	52			[617]
1-benzyl-2-ethylimidazolium chloride	<0.5	-86	171			[617]
1-benzyl-2-ethylimidazolium bromide	<0.5	-30	123			[617]
1-benzyl-2-ethylimidazolium BF_4	<0.5	-43				[617]
1-benzyl-2-ethylimidazolium perchlorate	<0.5	-31				[617]
1-benzyl-2-ethylimidazolium PF_6	<0.5	-24				[617]
1-benzyl-2-ethylimidazolium TfO	<0.5	-48				[617]
1-benzyl-2-ethylimidazolium Tf_2N	<0.5	-57				[617]
1-benzyl-2-ethylimidazolium BETI	<0.5	-54				[617]
1,2-dimethylimidazolium BF_4	<1	-74.7	31.3		365.2	[57]
1,2-dimethylimidazolium TfO	<1		115.3	298.9		[57]
1-alkylmethylimidazolium DL-lactate (alkyl from H to C_{12})			<20		194.0-244.5	[621]
1-alkyloxymethylimidazolium DL-lactate (alkyl from C_4 to C_{12})			<20		188.0-245.5	[621]
1-alkylmethylimidazolium L-lactate (alkyl from H to C_{12})			<20		191.3-238.5	[621]
1-alkyloxymethylimidazolium L-			<20		186.6-238.9	[621]

lactate (alkyl from C_4 to C_{12})						
1-propoxymethylimidazolium salicylate	0.09	-45				[62]
1-butoxymethylimidazolium salicylate	0.04	-47				[62]
1-pentoxymethylimidazolium salicylate	0.05	-49				[62]
1-hexyloxymethylimidazolium salicylate	0.05	-51				[62]
1-heptyloxymethylimidazolium salicylate	0.06	-52				[62]
1-octyloxymethylimidazolium salicylate	0.1	-54				[62]
1-nonoxymethylimidazolium salicylate	0.09	-56	24			[62]
1-decyloxymethylimidazolium salicylate	0.1	-56	22			[62]
1-unadecyloxymethylimidazolium salicylate	0.05	-57	12 and 29			[62]
benzimidazolium Tf_2N			117 [g]		390	[293]
1-(3-ammoniopropyl)-3-butyl-1*H*-imidazol-3-ium $[Tf_2N]_2$			-40.7			[102]
[BuG5H][hfac]		-68	[f]		250	[105]
[BuG5H][fod]		-51	34.5		145	[105]
[BuG5H][tfac]		-66	[f]		169	[105]
[BuG5H][bta]		[f]	48		180	[105]
[BuG5H][tta]		[f]	86		199	[105]
Heterocyclic ammonium group						
pyrrolidinium nitrate		[f]	-15		158	[66]
pyrrolidinium formate		-85	-10		170	[66]
pyrrolidinium formate	50-125 ppm		10.6			[16]
pyrrolidinium acetate		-104	-5		163	[66]
pyrrolidinium acetate	50-125 ppm		30.7			[16]
pyrrolidinium HSO_3^-		-102	-30		130	[66]
pyrrolidinium TFA		[f]	-10		180	[66]
pyrrolidinium octanoate		-105	-40		160	[66]
pyrrolidinium di-*n*-butylphosphate	50-125 ppm	-93.9	-3.7			[16]
pyrrolidinium MsOH	50-125 ppm	-15.1	122.1			[16]
pyrrolidinium sulfamate	225-275 ppm					[16]
pyrrolidinium saccharin	50-125 ppm	-62.1	33.4			[16]
pyrrolidinium Tf_2N	<1		35.0		373	[611]
pyrrolidinium heptafluorobutyrate	0.32		4			
1-methylpyrrolidinium BF_4	<300 ppm	-105	-33		282 [c]	[61]
1-methylpyrrolidinium BF_4			-31.9			[619]
1-methyl-2-oxopyrrolidinium BF_4	<300	-70	24		207 [c]	[61]

	ppm					
(2-hydroxyethyl)pyrrolidinium benzoate		-40	28			[433]
(2-hydroxyethyl)pyrrolidinium salicylate		-44	49			[433]
(2-hydroxyethyl)pyrrolidinium 5-hydroxysalicylate			97			[433]
1-(3-ammoniopropyl)-1-butylpyrrolidin-1-ium $[Tf_2N]_2$			-23.9			[102]
1-(3-ammoniopropyl)-1-methylpyrrolidin-1-ium $[Tf_2N]_2$			98.6			[102]
pyridinium TFSA	<1		60.3		314	[611]
2-methylpyridinium formate		-77				[12]
2-methylpyridinium TFA		-74	25			[12]
2-methylpyridinium CF_3SO_3			72			[622]
2-methylpyridinium CH_3SO_3			99			[622]
2-methylpyridinium Tf_2N		-87				[12]
2-ethylpyridinium TFA	0.91 wt%	-90				[74]
2-pentylpyridinium TFA	0.54 wt%	-83				[74]
3-ethylpyridinium TFA	0.54 wt%	[f]				[74]
2-methylpyridinium formate	0.45 wt%	-114				[74]
2-methylpyridinium TFA		-84				[73]
2-methylpyridinium TFA	0.29 wt%	-87				[74]
4-methylpyridinium TFA		-68				[73]
4,4'-trimethylenedipyridinium TFSA	<1		62.0		386	[611]
piperidinium TFSA	<1		37.9		363	[611]
N-ethylpiperidinium triflate	-76.2		52		372	[272]
N-ethylpiperidinium HSO_4	-53.7				246	[272]
N-ethylpiperidinium CH_3SO_3	-73.3		67.6		201	[272]
N-ethylpiperidinium $HPHO_3$	-71.3				136	[272]
N-ethylpiperidinium H_2PO_4	-11.7				144	[272]
1-methylpiperidinium BF_4	<300 ppm	-101	25		295 [c]	[61]
1-ethylpiperidinium BF_4	<300 ppm	-94	80		292 [c]	[61]
1-ethylpiperidinium BF_4		-77.2	-27.9			[619]
4,4'-trimethylenedipiperidinium TFSA	<1		167.3		403	[611]
2-methylpyrazinium TFA		-77				[73]
3-methylpyrazinium TFA		-82				[73]
4-methylmorpholin-4-ium BF_4	<300 ppm	-74	29		257 [c]	[61]
4-ethylmorpholin-4-ium BF_4	<300 ppm	-84	21		288 [c]	[61]
morpholinium formate	50-100 ppm	-87	5,7	152,138	>400	[623]
morpholinium TFSA	<1		58.5		349	[611]
N-methylmorpholinium formate	50-100 ppm	-89		136	>400	[623]
N-ethylmorpholinium formate	50-100	-89	-22		>400	[623]

	ppm					
benzamide trifluoromethanesulfonate	< 0.1		101.5		228.2	[106]
1*H*-1,2,4-triazole methanesulfonate			134 [g]		305	[273]
1,2,4-triazolium TFSA	<1		22.8		287	[611]
1,2,3-benzotriazolium TFSA	<1		136.6		230	[611]
1,5-diamino-1H-tetrazolium nitrate			138		168	[624]
1,5-diamino-1H-tetrazolium perchlorate			97		192	[624]
MTBD Tf_2N	110 ppm		24		379 [c]	[112]
MTBD BETI			-6		383 [c]	[112]
HTBD Tf_2N			57		371 [c]	[112]
HTBD BETI			58		338 [c]	[112]
DBU octylNCO_2			50			[614]
DBU butylNCO_2			58			[614]
DBU 1-napthylNCO_2			40			[614]
DBU phenylNCO_2			75			[614]
[MTBDH][hfac]		[f]	55		289	[105]
[MTBDH][fod]		-44	[f]		179	[105]
[BTBDH][hfac]		-46	[f]		261	[105]
[BTBDH][fod]		-41	[f]		198	[105]
[BTBDH][tfac]		-47	[f]		186	[105]
[BTBDH][bta]		-40	[f]		194	[105]
[BTBDH][tta]		-43	[f]		195	[105]
2DBUH hexdiNCO_2			55			[614]
fluorinated PILs [i]			42.3-250.0		140-250	[119]
2-methyl-1-pyrrolinium BF_4		-94.3	17.1			[619]
1-ethyl-2-phenylindolium BF_4		-73.9	29.8			[619]
1,2-dimethylindolium BF_4		-74.8	24.5			[619]
1-ethylcarbazolium BF_4		-68.0				[619]
2,4-lutidinium BF_4		-44.8	34.1			[619]
2,3-lutidinium BF_4			59.4			[619]
3,4-lutidinium BF_4		-33.3	45.9			[619]
2,6-lutidinium BF_4		-10.9	104.6			[619]
N,N'-dimethylcyclohexylammonium BF_4			89.0			[619]
N,N'-dimethylcyclohexanmethylammonium BF_4		-18.4	143.8			[619]
1-methylpyrrolium BF_4		-15.9				[619]
1-methylpyrazolium BF_4		-109.3	-5.9			[619]
2-methylindolium BF_4			131.0			[619]
pyrrolium BF_4		0.1				[619]
carbazolium BF_4		59.9				[619]
acridinium TFSA	<1		116.1		353	[611]
pyrazolium TFSA	<1		58.9		265	[611]
pyrazinium TFSA	<1		53.6		229	[611]
piperazinium TFSA	<1		172.7		358	[611]
benzimidazolium TFSA	<1		101.9		368	[611]
quinoxalinium TFSA	<1		74.1		244	[611]
caprolactam BF_4		-47			239	[625]

caprolactam TFA		-73			135	[625]
caprolactam TFA		-67	29		117	[625]
caprolactam phenol carboxylate		-55	31		118	[625]
caprolactam nitrate			45		188	[625]
caprolactam dihydrogen phosphate		-34				[625]
2-pyrrolidonium nitrate		-76	8		168	[625]
2-pyrrolidonium BF_4		-73			233	[625]
2-pyrrolidonium TFA		-90	32		125	[625]
2-pyrrolidonium phenol carboxylate		-63	7		163	[625]
2-pyrrolidonium dihydrogen phosphate		-46			249	[625]
2,5-diphenyl-1,3,4-oxadiazolium TFSA			80		200	[626]
N-methylpyrrolidinium formate	0.07	-116	-32			[618]
N-methylpyrrolidinium acetate	0.05	-108				[618]
N-methylpyrrolidinium TFA		38				[618]
anilinium TfO	<1				250	[57]
2-fluoropyridinium TfO	<1		58.3	286		[57]
DBU $(C_2F_5SO_2)_2N$		53			423	[113]
DBU $(CF_3SO_2)_2N$		25			451	[113]
DBU $C_4F_9SO_3$		70			440	[113]
DBU CF_3SO_3		23	-62		431	[113]
DBU HSO_4			-31		295	[113]
DBU CH_3SO_3			-42		288	[113]
DBU TFA			-56		183	[113]
DBU formate		89			194	[113]
DBU acetate			-44		171	[113]
ImPr hydrogen sulfate			62		322	[39]
ImPr hydrogen pimelate		-47			175	[39]
ImPr hydrogen phthalate		2	88		175	[39]
ImPr hydrogen oxalate			130		165	[39]
-phosphonium						
tributylphosphonium nitrate		-73	6		100 [e]	[103]
tributylphosphonium Tf_2N			50		240 [e]	[103]
tributylphosphonium Tf			188		220 [e]	[103]
tributylphosphonium CH_3SO_3		-73	5		210 [e]	[103]
trioctylphosphonium triflate		-87	9		363	[108]
triphenylphosphonium triflate		-12	117 [g]		208	[108]
t-BuP1 (dma) Tf_2N			130 [g]		324 [c]	[112]
t-BuP1 (dma) BETI			108 [g]		321 [c]	[112]
t-BuP1 (pyrr) Tf_2N			136 [g]		323 [c]	[112]
t-BuP1 (pyrr) BETI			87		322 [c]	[112]
BEMP Tf_2N			99		300 [c]	[112]
BEMP BETI			135 [g]		311 [c]	[112]
HP_1(dma) Tf_2N			39		325 [c]	[112]
HP_1 (dma) BETI			122 [g]		325 [c]	[112]
E_tP_2 (dma) Tf_2N			54		347 [c]	[112]
E_tP_2 (dma) BETI			86		319 [c]	[112]
[P_2-EtH][hfac]		[f]	70		307	[105]
[P_2-EtH][fod]		-68	[f]		274	[105]
[P_2-EtH][bta]		-57	[f]		268	[105]
[P_2-EtH][tta]		-68	[f]		184	[105]
[P1-t-BuH][hfac]		[f]	52		193	[105]
[P1-t-BuH][fod]		[f]	69		191	[105]

[a] explosive decomposition (exothermic peaks)

[b] series of small overlapping peaks in this temperature range.

[c] decomposition taken at 10% weight loss

[d] samples decomposed before melting

[e] decomposition taken at onset of mass loss

[f] not observed

[g] technically protic molten salts and not PILS since their melting point is > 100 °C.

[h] 5 % mass loss in TG experiments at 15 °C/min

[i] Chemical structures in reference [119]. The series consists of a perfluoroalkyl carboxylate anion combined with a 1,2,4-oxadiazole derivatised with combinations of pyridines and/or a perfluoroalkyl chain.

[j] Measurements at a pressure of 0.1 MPa

Table S2. Physicochemical Properties of PILs, including the density (ρ), air-liquid surface tension (γ_{LV}), viscosity (η), refractive index (n_D) and ionic conductivity (σ).

PIL	Water (wt%)	ρ (g/cm^3)	γ_{LV} (mN/m)	η (cP)	n_D	σ (mS/cm)	Ref
-ammonium							
methylammonium formate		1.087[a]	43.1[a]	17[a]	1.4336[a]	43.8[a]	[45]
ethylammonium nitrate		1.216[a]	47.3[a]	32[a]	1.4524[a]	26.9[a]	[45]
ethylammonium nitrate					1.4524[a]		[17]
ethylammonium formate		1.039[a]	38.5[a]	32[a]	1.4344[a]	12.16[a]	[45]
ethylammonium acetate	180	1.01771[a]			1.4345[a]	2.22	[609]
ethylammonium propionate		1.018[a]	31.5[a]	75[a]	1.4358[a]	0.872[a]	[45]
ethylammonium butyrate		0.980[a]	29.6[a]	208[a]	1.4398[a]	1.03[a]	[45]
ethylammonium glycolate		1.189[a]	49.3[a]	1200[a]	1.4692[a]	0.864[a]	[45]
ethylammonium lactate		1.110[a]	39.3[a]	803[a]	1.4581[a]	0.26[a]	[45]
ethylammonium HSO_4						34.1[j]	[272]
ethylammonium HSO_4		1.438[a]	56.3[a]	128[a]	1.4489[a]	4.4[a]	[45]
ethylammonium heptafluorobutyrate	0.51					0.88[s]	[104]
ethylammonium pentadecafluorooctanoate	0.61					0.169[j]	[104]
propylammonium nitrate					1.4549[a]		[17]
propylammonium nitrate		1.157[a]		66.6[a]	1.4561[a]		[610]
propylammonium formate	6753 ppm	0.99618[z]		96.77[z]			[60]
propylammonium acetate	150	0.96682[a]			1.4405[a]	0.43	[609]
propylammonium acetate	5436 ppm	0.98997[z]		932.22[z]			[60]
isopropylammonium formate		1.095[l]		61[a]		5.5[c,l]	[345]
butylammonium nitrate					1.4527		[17]

					[a]		
butylammonium formate		0.968[a]	33.3[a]	70[a]	1.4422[a]	3.1[a]	[45]
butylammonium acetate		0.95[a,c]		630 [a,c]		0.4[a,c]	[13]
butylammonium Tf_2N						10.4[g]	[611]
butylammonium heptafluorobutyrate	0.41					0.325 [j]	[104]
butylammonium pentadecafluorooctanoate	0.55					0.055 [r]	[104]
butylammonium thiocyanate		0.949[a]		97.1[a]	1.5264[a]		[610]
sec-butylammonium thiocyanate		1.013[a]		196[a]	1.5262[a]		[610]
pentylammonium formate		0.95[a]	31.9[a]	78[a]	1.4434[a]	1.53[a]	[45]
heptylammonium acetate		0.92[a,c]		500[a,c]		0.08[a,c]	[13]
dimethylammonium formate	0.41	1.046 [a]	44.2 [a]	8.1 [a]	1.4147 [a]	51.10 [a]	[46]
dimethylammonium HSO_4	0.56	1.558 [a]	69.5 [a]	120 [a]	1.4426 [a]	8.10 [a]	[46]
diethylammonium formate	0.44	0.990 [a]	38.3 [a]	5.4 [a]	1.4264 [a]	13.13 [a]	[46]
diethylammonium butyrate	< 890 ppm	1.10997 [z]			1.476 [z]		[627]
diethylammonium HSO_4						19.7 [j]	[272]
diethylammonium di-*n*-butylphosphate	50-125 ppm	1.009 [a]		201 [a]		0.08 [a]	[16]
diethylammonium heptafluorobutyrate	0.15					2.26 [t]	[104]
di-*n*-propylammonium thiocyanate		0.964[a]		85.9[a]	1.5062[a]		[610]
dibutylammonium formate	50-125 ppm	0.920 [a]		113 [a]		1.05 [a]	[16]
dibutylammonium Tf_2N						12.6[g]	[611]
triethylammonium heptafluorobutyrate	0.30					0.679 [a]	[104]
triethylammonium formate	0.19	1.028 [a]	42.5 [a]	5.8 [a]	1.4298 [a]	13.05 [a]	[46]
triethylammonium formate [k]		1.04 [a]		10 [a]		0.36 [a]	[58]
triethylammonium formate	50-125 ppm	0.992 [a]		17.7 [a]		8.85 [a]	[16]
triethylammonium acetate [k]		0.96 [a]		11 [a]		1.27 [a]	[58]
triethylammonium Tf_2N				30 [a]		5 [a] 20 [f]	[274]
triethylammonium Tf_2N	< 10 ppm					4[z]	[275]
triethylammonium Tf_2N						32.3[g]	[611]
triethylammonium di-*n*-butylphosphate	50-125 ppm	1.007 [a]		94.4 [a]		0.23 [a]	[16]
triethylammonium MsOH	50-125 ppm	1.135 [a]		100 [a]		1.91 [a]	[16]
triethylammonium triflate						30 [g]	[323]
triethylammonium hfipOSO$_3$				47[aa]		4.15[aa]	[110]
tributylammonium nitrate				0.214 [f]		2x10^{-5} [c,h] 0.1 [c,d] 2 [c, v]	[103]
tri-*n*-butylammonium nitrate		0.918[a]		637[a]	1.4627[a]		[610]
tributylammonium di-*n*-butyl phosphate	50-125 ppm	0.941 [a]		105 [a]		0.07 [a]	[16]
tributylammonium Tf_2N				0.151 [f]		8x10^{-6} [c,h] 9x10^{-3} [c,d] 10 [c,g]	[103]

tributylammonium Tf						$1x10^{-6}$ c,h $4x10^{-4}$ c,d 0.2 c,g	103
tributylammonium CH_3SO_3						$8x10^{-6}$ c,h $1x10^{-3}$ c,d 4 c,g	103
$[C_6H_{13}]_3NH$ Tf_2N		1.12[b]		170[b]			628
$[C_8H_{17}]_3NH$ Tf_2N		1.06[b]		219[b]			628
$[C_8H_{17}]NH_3$ Tf_2N		1.37[b]		331[b]			628
$[C_2H_5]_3NH$ BETI		1.48[b]		163[b]			628
$[C_8H_{17}]NH_3$ BETI		1.45[b]		763[b]			628
ethanolammonium heptafluorobutyrate	0.50					0.486 [r]	104
ethanolammonium nitrate		1.265[a]	50.6[a]	113[a]	1.4400[a]	9.35[a]	45
ethanolammonium formate		1.184[a]	65.0[a]	220[a]	1.4705[a]	3.4[a]	45
ethanolammonium formate	<82x10^{-4} water mass fraction	1.1399 [a]		66.2 [a]		6.32 [a]	59 supp
ethanolammonium acetate	<84x10^{-4} water mass fraction	1.1529 [a]		575 [t]		0.21 [a]	59 supp
ethanolammonium acetate		1.149039 [a]					134
ethanolammonium acetate		1.176[a]	51.5[a]	701[a]	1.469[a]	0.3[a]	45
ethanolammonium lactate		1.228[a]	57.2[a]	1324[a]	1.4702[a]	0.048[a]	45
ethanolammonium HSO_4	0.62	1.407 [a]	82.1 [a]	309 [a]	1.4578 [a]	4.90 [a]	46
ethanolammonium pentanoate		1.045479 [a]		1270.1 [a]	1.46290 [a]	0.2396 [a]	464
ethanolammonium hexanoate	< 600 ppm	0.99417 [a]			1.4555 [a]		136
ethanolammonium malonate	<93x10^{-4} water mass fraction	1.3327 [a]		817 [s]		0.0149 [a]	59 supp
propanolammonium formate	<86x10^{-4} water mass fraction	1.1562 [a]		310 [a]		1.57 [a]	59 supp
propanolammonium acetate	<98x10^{-4} water mass fraction	1.1170 [a]		763 [t]		0.12 [a]	59 supp
propanolammonium malonate	<94x10^{-4} water mass fraction	1.2559 [a]		833 (75C)		0.022 [a]	59 supp
2-propanolammonium formate		1.144[a]	46.2[a]	854[a]	1.4642[a]	0.49[a]	45
3-propanolammonium formate	7124 ppm	1.14829 [z]		339.04 [z]			60
3-propanolammonium acetate	7538 ppm	1.11458 [z]		4261.70[z]			60

3-propanolammonium TFA	7482 ppm	1.31144 [z]		1430.20 [z]			[60]
N-methyl-2-hydroxyethylammonium propionate	< $3x10^{-4}$	1.066 [a,c]					[629]
N-methyl-2-hydroxyethylammonium butyrate	< $3x10^{-4}$	1.036 [a,c]					[629]
N-methyl-2-hydroxyethylammonium pentanoate	< $3x10^{-4}$	1.010 [a,c]					[629]
diethanolammonium formate	0.60	0.988 [a]	63.4 [a]	494 [a]	1.4806 [a]	0.77 [a]	[46]
diethanolammonium formate	<$88x10^{-4}$ water mass fraction	1.2193 [a]		951 [a]		0.55 [a]	[59] supp
diethanolammonium formate [k]		1.13 [a]		28 [a]		5.83 [a]	[58]
diethanolammonium formate	50-125 ppm	1.220 [a]		762 [a]		0.93 [a]	[16]
diethanolammonium acetate	<$85x10^{-4}$ water mass fraction	1.1777 [a]		711 [t]		0.13 [a]	[59] supp
diethanolammonium acetate	50-125 ppm	1.181 [a]		5647 [a]		0.11 [a]	[16]
diethanolammonium acetate [k]		1.22 [a]		336 [a]		0.14 [a]	[58]
diethanolammonium pentanoate		1.072811 [a]		803.2 [a]	1.46854 [a]	0.2188 [a]	[464]
diethanolammonium HSO_4 [k]		1.21 [a]				0.04 [a]	[58]
diethanolammonium sulfamate [k]		1.45 [a]		720 [a]		14.21 [a]	[58]
diethanolammonium sulfamate	225-275 ppm	1.430 [a]		449 [a]		0.14 [a]	[16]
diethanolammonium chloride [k]		1.24 [a]		305 [a]		0.86 [a]	[58]
diethanolammonium di-*n*-butyl phosphate	50-125 ppm	1.110 [a]		2409 [a]		0.06 [a]	[16]
diethanolammonium MsOH	50-125 ppm	1.344 [a]		1590 [a]		0.32 [a]	[16]
diethanolammonium malonate	<$44x10^{-4}$ water mass fraction	1.2409 [a]		489 [y]		0.053 [a]	[59] supp
di-n-propylammonium formate [k]		0.97 [a]		19 [a]		1.19 [a]	[58]
triethanolammonium formate	<$91x10^{-4}$ water mass fraction	1.2201 [t]		321 [t]		0.95 [t]	[59] supp
triethanolammonium acetate	<$101x10^{-4}$ water mass fraction	1.1752 [w]		797 [w]		0.25 [w]	[59] supp
triethanolammonium pentanoate		1.093275 [a]	33.37 [a]	505.5 [a]	1.46893 [a]	0.1601 [a]	[464]
triethanolammonium malonate	<$52x10^{-4}$	1.1466 [a]		672 [y]		0.024	[59] supp

	water mass fraction						
N,N-dimethylpropylammonium TfO	< 100 ppm	1.269[d, bb]		33.2[d, bb]		9.01[d, bb]	98
N,N-diethylmethylammonium TfO	< 100 ppm	1.277[d, bb]		36.9[d, bb]		8.33[d, bb]	98
N–allyldimethylammonium TfO	< 100 ppm	1.295[d, bb]		28.8[d, bb]		9.68[d, bb]	98
N-allyldiethylammonium TfO	< 100 ppm	1.247[d, bb]		51.0[d, bb]		4.19[d, bb]	98
N,N-diethylpropylammonium TfO	< 100 ppm	1.215[d, bb]		54.3[d, bb]		3.84[d, bb]	98
N,N-diallylmethylammonium TfO	< 100 ppm	1.246[d, bb]		38.5[d, bb]		4.69[d, bb]	98
N-methyldipropylammonium TfO	< 100 ppm	1.203[d, bb]		48.7[d, bb]		4.15[d, bb]	98
diphenylammonium TFSA						8.5[g]	611
2-methylpropylammonium formate		0.978[a]	31.2[a]	225[a]	1.4434[a]	0.699[a]	45
2-methylbutylammonium formate		0.965[a]	30.8[a]	229[a]	1.4462[a]	0.858[a]	45
N-methyl-2-hydroxyethylammonium formate		1.12825[a]		20.27[a]	1.4458[a]		630
N-methyl-2-hydroxyethylammonium acetate		1.10083[a]		106.06[a]	1.4494[a]		630
N-methyl-2-hydroxyethylammonium propionate		1.07127[a]		215.05[a]	1.4534[a]		630
N-methyl-2-hydroxyethylammonium butyrate		1.03924[a]		298.15[a]	1.4549[a]		630
N-methyl-2-hydroxyethylammonium isobutyrate		1.04337[a]		163.08[a]	1.4511[a]		630
N-methyl-2-hydroxyethylammonium pentanoate		1.01621[a]		234.44[a]	1.4538[a]		630
HNC(dma)H BETI		1.51[l]		224[b]		0.79[a]	112 supp
2-(2-hydroxy-ethoxy)-ethyl-ammonium formate	0.66	1.172[a]	52.2[a]	61[a]	1.4600[a]	2.54[a]	46
2-(2-hydroxy-ethoxy)-ethyl-ammonium nitrate	0.34	1.305[a]	61.8[a]	281[a]	1.4659[a]	1.12[a]	46
2-(2-hydroxy-ethoxy)-ethyl-ammonium HSO_4	0.54	1.388[a]	57.7[a]	1310[a]	1.4684[a]	0.32[a]	46
1.045479 a2-(2-hydroxy-ethoxy)-ethyl-ammonium TFA	0.71	1.343[a]	40.1[a]	1010[a]	1.4162[a]	0.36[a]	46
2-methoxy-ethyl-ammonium formate	0.58	1.105[a]	42.7[a]	38[a]	1.4472[a]	4.59[a]	46
bis(2-hydroxyethyl)methylammoniu	130 ppm	1.17990[a]	55.26[a]				631

m formate							
bis(2-methoxyethyl)ammonium formate	~100ppm	1.062 [a]		10.1 [a]		1.05 [a]	[278]
bis(2-methoxyethyl)ammonium acetate	~100ppm	1.045 [a]		15.2 [a]		1.03 [a]	[278]
dimethylbutylammonium acetate		0.86 [a,c]		2 [a,c]		1.3 [a,c]	[13]
dimethylethylammonium Tf_2N						46 [j]	[272]
dimethylethylammonium triflate						56 [j]	[272]
dimethylethylammonium HSO_4						38.3 [j]	[272]
diethylmethylammonium Tf_2N						41 [j]	[272]
diethylmethylammonium triflate						43.3 [j]	[272]
diethylmethylammonium CH_3SO_3						22.2 [j]	[272]
diethylmethylammonium HSO_4						19.7 [j]	[272]
diethylmethylammonium H_2PO_4						6.51 [j]	[272]
diethylmethylammonium triflate	< 2 mol %	1.286 [m]		40.8 [a]			[276]
diethylmethylammonium OMs	< 2 mol %	1.166 [m]		82.2 [a]			[276]
diallylammonium formate	$<209x10^{-4}$ water mass fraction	0.9354 [s]		2.45 [a]		0.006 [a]	[59] supp
diallylammonium acetate	$<435x10^{-4}$ water mass fraction	0.9784 [a]		80 [a]		1.44 [a]	[59] supp
diallylammonium malonate	$<55x10^{-4}$ water mass fraction	1.0845 [t]		211.5 [t]		0.16 [a]	[59] supp
diisopropylmethylammonium formate		1.002 [a]		25.0 [a]	1.4465 [a]	8.2 [a]	[64]
diisopropylmethylammonium acetate		0.995 [a]		32.2 [a]	1.4380 [a]	1.6 [a]	[64]
diisopropylmethylammonium hydrogenebisfluoride		1.055 [a]		100.0 [a]	1.4095 [a]	7.6 [a]	[64]
diisopropylethylammonium formate		1.015 [a]		18.0 [a]	1.4480 [a]	5.0 [a]	[64]
diisopropylethylammonium formate	20-50ppm	1.0083 [a]					[70]
diisopropylethylammonium formate	50-80 ppm	1.0144 [a]		18.0 [a]		5.80 [a]	[69]
diisopropylethylammonium acetate		0.982 [a]		54.4 [a]	1.4435 [a]	1.3 [a]	[64]
diisopropylethylammonium heptanoate	50 ppm	0.8665 [a]		12.23 [a]			[65]
diisopropylethylammonium octanoate	50 ppm	0.8585 [a]		13.52 [a]			[65]
diisopropylethylammonium hydrogenebisfluoride		1.003 [a]		81.1 [a]	1.4205 [a]	3.4 [a]	[64]
alanine methyl ester glycolate	0.18	1.20 [b]	50.5 [b]	15.46 [a]	1.4659	0.0236 [a]	[115]

					[b]		
alanine ethyl ester nitrate	0.44	1.28 [b]	46.7 [b]		1.4604 [b]	0.38 [a]	[115]
alanine ethyl ester formate	0.85	1.13 [b]	31.0 [b]	2.21 [a]	1.4487 [b]	1.307 [a]	[115]
alanine ethyl ester glycolate	0.62	1.32 [b]	46.3 [b]	5.48 [a]	1.4640 [b]	0.0554 [a]	[115]
glycine ethyl ester formate	0.72	1.07 [b]	37.4 [b]		1.4511 [b]	2.198 [a]	[115]
glycine ethyl ester lactate	0.17	1.18 [b]	42.6 [b]	10.77 [a]	1.4652 [b]	0.0409 [a]	[115]
proline methyl ester nitrate	0.35	1.33 [b]	51.1 [b]	0.513 [a]	1.4834 [b]	1.835 [a]	[115]
proline methyl ester formate	0.74	1.13 [b]	30.6 [b]	0.025 8 [a]	1.4827 [b]	0.0191 [a]	[115]
proline methyl ester acetate	0.70	1.18 [b]	29.1 [b]	0.045 4 [a]	1.4538 [b]	0.889 [a]	[115]
proline methyl ester glycolate	0.74	1.34 [b]	35.2 [b]	4.82 [a]	1.4862 [b]	0.0861 [a]	[115]
proline methyl ester lactate	0.76	1.33 [b]	30.7 [b]	2.88 [a]	1.4765 [b]	0.118 [a]	[115]
isobutyramide trifluoromethanesulfonate	< 0.1			11.9 [c, q] 4.6 [g]		13 [q] 32.6 [u]	[106]
n-butyramide trifluoromethanesulfonate	< 0.1					10 [q] 27 [u]	[106]
acetamide trifluoroacetate	0.47			10.0 [a]		2.5 [a] 10.7 [f]	[114]
acetamide acetate	0.22			7.7 [a]		0.08 [a] 0.57 [f]	[114]
benzamide trifluoromethanesulfonate	< 0.1					21 [u]	[106]
amilaminium formate	20-35 ppm	1.1630 [a]				0.35 [a]	[69]
quinolinium formate	170 ppm	1.1530 [a]		8.20 [a]		4.15 [a]	[69]
lutidinium formate	80-90 ppm	1.0209 [a]		2.61 [a]		10.40 [a]	[69]
collidinium formate	100 ppm	1.1676 [a]		10.0 [a]		6.71 [a]	[69]
collidinium formate	20-50ppm	1.0210 [a]					[70]
1,1,3,3-tetramethylguanidinium TFA		1.27 [t]		143.7 [t]		1.886 [t]	[615]
1,1,3,3-tetramethylguanidinium perchlorate		1.18 [t]		80.6 [t]		1.958 [a]	[615]
1,1,3,3-tetramethylguanidinium TfO		1.29 [t]		167.4 [t]		2.680 [t]	[615]
1,1,3,3-tetramethylguanidinium lactate		1.07 [t]		388.2 [t]		0.101 [a]	[615]
ethyldiammonium formate	50-125 ppm	1.107 [a]		112 [a]		9.83 [a]	[16]
ethyldiammonium acetate	50-125 ppm	1.103 [a]		958 [a]		0.59 [a]	[16]
ethyldiammonium triflate						35 [g]	[323]
ethyldiammonium di-*n*-butyl phosphate	50-125 ppm	1.068 [a]		2945 [a]		0.08 [a]	[16]
N-butylethylenediaminium Tf_2N	0.01-0.02	1.45 [d]				48.9 [d]	[161]
N-hexylethylenediaminium Tf_2N	0.01-0.02	1.40 [a]				25.8 [a]	[161]

N-2-ethylhexylethylenediaminium Tf_2N	0.01-0.02	1.33 [a]				21.9 [a]	161
N-octylethylenediaminium Tf_2N	0.01-0.02	1.33 [a]				19.8 [a]	161
N-decylethylenediaminium Tf_2N	0.01-0.02	1.28 [a]				13.9 [a]	161
N-dodecylethylene-diaminium Tf_2N	0.01-0.02	1.25 [a]				10.5 [a]	161
-imidazolium							
imidazolium $C_5H_{11}CO_2$	20-50ppm	1.0246 [a]	34.4 [a]	71.8 [a]		1.179 [a]	71
imidazolium $C_6H_{13}CO_2$	20-50ppm	1.0037 [a]	33.0 [a]	75.9 [a]		0.863 [a]	71
imidazolium $C_7H_{15}CO_2$	20-50ppm	0.9870 [a]	32.8 [a]	76.5 [a]		0.621 [a]	71
imidazolium $C_8H_{17}CO_2$	20-50ppm	0.9690 [a]	32.5 [a]	95.0 [a]		0.462 [a]	71
imidazolium Tf_2N						24 [j]	ref in 272
imidazolium Tf_2N						27.1 [g]	611
butylimidazolium Tf_2N						10 [j]	ref in 272
1-methylimidazolium formate				6.7 [a]		20 [a]	618
1-methylimidazolium acetate				5.6 [a]		4 [a]	618
1-methylimidazolium acetate		1.1551 [a]		83.51 [a]		3.33 [a]	632
1-methylimidazolium perchlorate				>1000 [a]			617
1-methylimidazolium PF_6				>1000 [a]			617
1-methylimidazolium TfO				>1000 [a]			617
1-methylimidazolium Tf_2N				81 [a]		7.23 [a]	617
1-methylimidazolium BETI				218 [a]			617
1-methylimidazolium HSO_4						6.5 [d]	620
1-methylimidazolium H_2PO_3						0.22 [d]	620
1-methylimidazolium H_2PO_4						$5.5x10^{-5}$ [d]	620
1-methylimidazolium H_3PO_7						$7.4x10^{-3}$ [d]	620
1-methylimidazolium TFA						1 [a]	618
1-methylimidazolium BF_4						0.3 [a] 2.8 [r]	619
1-methylimidazolium heptafluorobutyrate	0.32					9.25 [f]	104
1-methylimidazolium pentadecafluorooctanoate	0.85					3.27 [q]	104
2-imidazolidonium TFA	<0.15			6.1 [j]		3.2 [j]	633
1-ethylimidazolium nitrate						5 [a z]	617
1-ethylimidazolium triflate	< 2 mol %	1.421 [m]		6 5.3 [a]			276
1-ethylimidazolium TfO				58 [a]			617
1-ethylimidazolium OMs	< 2 mol %	1.256 [m]		343.8 [a]			276
1-ethylimidazolium chloride						0.03 [a z]	617
1-ethylimidazolium perchlorate				112 [a]		5 [a z]	617
1-ethylimidazolium bromide						0.01 [a z]	617
1-ethylimidazolium BF_4				41 [a]		6 [a z]	617
1-ethylimidazolium BETI				133 [a]		1 [a z]	617
1-ethylimidazolium Tf_2N				54 [a]		4 [a z]	617
1-ethylimidazolium Tf_2N	112 x 10^{-6} mass fraction	1.57293 [a]		60.03 [a]		0.3682 [a]	634

1-ethylimidazolium PF_6				550[a]		0.8[a z]	617
1-ethylimidazolium HSO_4						0.24[d]	620
1-ethylimidazolium H_2PO_3						0.33[d]	620
1-ethylimidazolium H_2PO_4						$1.1x10^{-2}$[d]	620
1-ethylimidazolium H_3PO_7						$2.7x10^{-2}$[d]	620
BIm triflate	< 2 mol %	1.330[m]		137.8[a]			276
BIm OMs	< 2 mol %	1.191[m]		571.5[a]			276
1-methyl-2-methylimidazolium BF_4				100[a]			617
1-methyl-2-methylimidazolium perchlorate				>1000[a]			617
1-methyl-2-methylimidazolium PF_6				>1000[a]			617
1-methyl-2-methylimidazolium TfO				>1000[a]			617
1-methyl-2-methylimidazolium TFSA				100[a]		3[a z]	617
1-methyl-2-methylimidazolium BETI				>1000[a]			617
1-ethyl-2-methylimidazolium BF_4				67[a]			617
1-ethyl-2-methylimidazolium perchlorate				>1000[a]			617
1-ethyl-2-methylimidazolium TfO				>1000[a]		4[a z*]	617
1-ethyl-2-methylimidazolium TFSA				69[a]		2[a z]	617
1-ethyl-2-methylimidazolium BETI				186[a]			617
1-ethyl-2-methylimidazolium PF_6				>1000[a]			617
benzimidazolium TFSA						13.1[g]	611
1-methylbenzimidazolium BF_4						$1.3x10^{-5}$[r]	619
N-butyl-1-methylimidazolium hfipOSO$_3$				110[aa]		2.10[aa]	110
1-benzyl-2-ethylimidazolium BF_4				>1000[a]			617
1-benzyl-2-ethylimidazolium perchlorate				>1000[a]			617
1-benzyl-2-ethylimidazolium PF_6				>1000[a]			617
1-benzyl-2-ethylimidazolium TfO				>1000[a]			617
1-benzyl-2-ethylimidazolium TFSA				252[a]		0.08[a z]	617
1-benzyl-2-ethylimidazolium BETI				552[a]			617
1-alkylmethylimidazolium DL-lactate (alkyl from H to C_{12})		0.9591 to 1.1231[a]				0.089 to 0.995[a]	621
1-alkylmethylimidazole L-lactate (alkyl from H to C_{12})		0.9626 to 1.1281[a]				0.066-0.978[a]	621

1-alkyloxymethylimidazolium L-lactate (alkyl from C_4 to C_{12})		0.9826 to 1.0695[a]				0.088-0.260[a]	[621]
1-alkyloxymethylimidazolium DL-lactate (alkyl from C_4 to C_{12})		0.9804 to 1.0640[a]				0.091-0.281[a]	[621]
[BuG5H][hfac]		1.42[l]		66.1[b]			[105]
[BuG5H][fod]		1.38[l]		446[b]			[105]
[BuG5H][tfac]		1.28[l]		190[b]			[105]
benzimidazolium Tf_2N						13[g]	[293]
Heterocyclic ammonium group							
pyrrolidinium nitrate		1.1675[a]		5.2[a]		50.1[a]	[66]
pyrrolidinium nitrate	20-50ppm	1.1675[a]			1.3995[a]		[70]
pyrrolidinium nitrate	300 ppm	1.1676[a]		5.2[a]		50.2[a]	[69]
pyrrolidinium nitrate	$2x10^{-3}$	1.2204[d]		28.81[d]		50[c,d] 100[c,f]	[635]
pyrrolidinium hydrogen sulfate		1.3421[a]		190.1[a]		6.8[a]	[66]
pyrrolidinium hydrogen sulfate	20-50ppm	1.3421[a]					[70]
pyrrolidinium hydrogen sulfate	200-30000ppm			187.6[a]			[67]
pyrrolidinium hydrogen sulfate	300 ppm					4.60[a]	[67]
pyrrolidinium hydrogen sulfate	8000 ppm					4.0[a]	[67]
pyrrolidinium formate		1.1190[a]		2.5[a]		32.9[a]	[66]
pyrrolidinium formate	20-50ppm	1.1190[a]					[70]
pyrrolidinium formate	100 ppm	1.1190[a]		2.5[a]		32.95[a]	[69]
pyrrolidinium acetate	500 ppm	1.0543[a]		30.2[a]		5.94[a]	[69]
pyrrolidinium acetate		1.0543[a]		30.2[a]		5.9[a]	[66]
pyrrolidinium TFA		1.2310[a]		21.0[a]		16.4[a]	[66]
pyrrolidinium TFA	6000-22000ppm			25.7[a]			[67]
pyrrolidinium TFA	22000 ppm			26[a]			[67]
pyrrolidinium TFA	6000 ppm			24[a]			[67]
pyrrolidinium $C_5H_{11}CO_2$	20-50ppm	0.9880[a]	34.0[a]	27.4[w]		1.650[a]	[71]
pyrrolidinium $C_5H_{11}CO_2$	30 ppm	0.9880[a]		27.4[a]		1.95[a]	[69]
pyrrolidinium $C_6H_{13}CO_2$	20-50ppm	0.9721[a]	33.5[a]			1.026[a]	[71]
pyrrolidinium $C_6H_{13}CO_2$	45-60 ppm	0.9721[a]				1.02[a]	[69]
pyrrolidinium $C_7H_{15}CO_2$	20-50ppm	0.9495[a]	33.0[a]	36.5[a]		0.812[a]	[71]
pyrrolidinium $C_7H_{15}CO_2$		0.9485[a]		36.5[a]		0.8[a]	[66]
pyrrolidinium $C_7H_{15}CO_2$	80 ppm	0.9452[a]	32.7[a]	62.7[a]	1.4581[a]	0.852[a]	[68]
pyrrolidinium $C_7H_{15}CO_2$	80 ppm	0.9495[a]		36.5[a]		0.81[a]	[69]
pyrrolidinium $C_8H_{17}CO_2$	20-50ppm	0.9315[a]	32.7[a]	74.4[a]		0.639[a]	[71]
pyrrolidinium $C_8H_{17}CO_2$	120 ppm	0.9315[a]		74.4[a]		0.63[a]	[69]
pyrrolidinium heptafluorobutyrate	0.32	1.4598[a]	26.31[a]	143[a]	1.3747[a]	2.01[a]	[104]
pyrrolidinium di-*n*-butylphosphate	50-125 ppm	1.056[a]		105[a]		0.28[a]	[16]
pyrrolidinium acetate	50-125	1.067[a]		36.3[a]		3.02[a]	[16]

	ppm						
pyrrolidinium formate	50-125 ppm	1.050 [a]		15.4 [a]		20.05 [a]	[16]
pyrrolidinium saccharin	50-125 ppm	1.101 [a]		499 [a]		0.91 [a]	[16]
pyrrolidinium TFSA						39.6[g]	[611]
1-methylpyrroldinium acetate		0.95[a,c]		2.5[a,c]		2.5[a,c]	[13]
caprolactam BF_4		1.33[a]		503[a]			[625]
caprolactam TFA		1.24[a]		28[a]			[625]
1-methylpyrrolidinium BF_4	<300 ppm	1.250 [d]		27.7 [d]	1.4148 [e]	31.4 [d]	[61]
1-methylpyrrolidinium BF_4						16[a] 25[r]	[619]
N-methylpyrrolidinium TFA						1[a]	[618]
N-methylpyrrolidinium formate				7.5 [a]		20[a]	[618]
N-methylpyrrolidinium acetate				3.2 [a]		2[a]	[618]
2-pyrrolidinonium heptafluorobutyrate	0.69	1.4139 [a]	26.98 [a]	68.2 [a]	1.3879 [a]	0.375 [a]	[104]
2-pyrrolidonium BF_4		1.46[a]		350[a]			[625]
2-pyrrolidonium TFA		1.32[a]		11[a]			[625]
1-methyl-2-oxopyrrolidinium BF_4	<300 ppm	1.325 [d]		151.7 [d]	1.4396 [e]	2.14 [d]	[61]
pyridinium TFSA						30.4[g]	[611]
2-methylpyridinium TFA		1.313 [m]		24.9 [e]		4.73 [e]	[73]
2-methylpyridinium TFA		1.318 [m]		25.05 [e]		3.39 [e]	[75]
2-methylpyridinium TFA		1.039[a z]		26.4[a z]		3 [a c]	[12]
2-methylpyridinium formate		1.2969[a z]		2.29[a z]		10[a c]	[12]
2-methylpyridinium TFSA		1.3421[a z]		89.5[a z]		0.1[a c]	[12]
2-ethylpyridinium TFA	0.91	1.247 [m]		20.27 [e]		3.13 [e]	[74]
2-pentylpyridinium TFA	0.54	1.167 [m]		33.87 [e]		1.10 [e]	[74]
3-ethylpyridinium TFA	0.54	1.252 [m]		22.62 [e]		3.87 [e]	[74]
2-methylpyridinium formate	0.45	1.048 [m]		2.77 [e]			[74]
4-methylpyrimidinium TFA		1.423 [m]		484 [e]		0.71 [e]	[73]
4,4'-trimethylenedipyridinium TFSA						10.5[g]	[611]
piperidinium TFSA						23.5[g]	[611]
1-methylpiperidinium BF_4	<300 ppm	1.272 [d]		139.8 [d]	1.4301 [e]	8.19 [d]	[61]
1-ethylpiperidinium BF_4						$9.4x10^{-2}$[a] 0.59[r]	[619]
pyrazinium TFSA						33.8[g]	[611]
2-methylpyrazinium TFA		1.351 [m]		10.3 [e]		3.8 [e]	[73]
3-methylpyrazinium TFA		1.323 [m]		40.2 [e]		3.04 [e]	[73]
pyrazolium TFSA						26.5[g]	[611]
1-methylpyrazolium BF_4						19[a] 35[r]	[619]
N-ethylpiperidinium CH3SO3						12.7[j]	[272]
N-ethylpiperidinium triflate						25.8[j]	[272]
N-ethylpiperidinium HSO_4						08.8[j]	[272]
2-methyl-1-pyrrolinium BF_4						16[a] 27[r]	[619]

morpholinium TFSA						10.8[g]	[611]
4-methylmorpholin-4-ium BF_4	<300 ppm	1.349[d]		287.3[d]	1.4275[e]	3.12[d]	[61]
4-ethylmorpholin-4-ium BF_4	<300 ppm	1.294[d]		216.2[d]	1.4346[e]	3.2[d]	[61]
morpholinium formate[l]	50-100 ppm	1.155[a]		21.2[a]	1.4707[a]	9.92[j]	[623]
N-methylmorpholinium formate	50-100 ppm	1.126[a]		5.86[a]	1.4517[a]	16.77[j]	[623]
N-ethylmorpholinium formate	50-100 ppm	1.062[a]		10.64[a]	1.4535[a]	12.17[j]	[623]
1-ethyl-2-phenylindolium BF_4						8.9[a] 16[r]	[619]
1,2-dimethylindolium BF_4						4.3[a] 11[r]	[619]
1-ethylcarbazoliun BF_4						2.2[a] 5.1[r]	[619]
2,4-lutidinium BF_4						0.23[a] 0.59[r]	[619]
2,3-lutidinium BF_4						0.0059[a] 0.080[r]	[619]
3,4-lutidinium BF_4						0.0036[a] 0.053[r]	[619]
2,6-lutidinium BF_4						1.6×10^{-5}[a] 1.8×10^{-4}[r]	[619]
quinoxalinium TFSA						16.5[g]	[611]
N,N'-dimethylcyclohexylammonium BF_4						7.3×10^{-6}[a] 9.8×10^{-5}[r]	[619]
N,N'-dimethylcyclohexanmethylammonium BF_4						1.3×10^{-5}[a]	[619]
1-methylindolium BF_4						2.0×10^{-6}[r]	[619]
2-methylindolium BF_4						1.6×10^{-6}[r]	[619]
2,3-dimethylindolium BF_4						2.0×10^{-6}[r]	[619]
pyrrolium BF_4						1.4×10^{-6}[a] 3.4×10^{-6}[r]	[619]
1-methylpyrrolium BF_4						1.3×10^{-6}[a] 1.7×10^{-6}[r]	[619]
carbazolium BF_4						1.3×10^{-6}[r]	[619]
1*H*-1,2,4-triazolium methanesulfonate						25[c,p]	[273]
1,2,4-triazolium TFSA						22.0[g]	[611]
MTBDH Tf_2N	110 ppm	1.49[l]		148[b]		1.49[a]	[112]
MTBDH BETI		1.52[l]		421[b]		0.70[a]	[112]
[MTBDH][fod]		1.46[l]		935[b]			[105]
[BTBDH][hfac]		1.43[l]		538[b]			[105]

[BTBDH][fod]		1.32 [l]		>1500 [b]			[105]
[BTBDH][tfac]		1.30 [l]		>1500 [b]			[105]
[BTBDH][bta]		1.38 [l]		>1500 [b]			[105]
[BTBDH][tta]		1.36 [l]		>1500 [b]			[105]
MTBD BETI	< 370 ppm	1.57917 [a]					[101]
DBU $(C_2F_5SO_2)_2N$				30 [q,c]		1 [d,c]	[113]
DBU $(CF_3SO_2)_2N$		1.42 [d,c]		200 [e,c]			[113]
DBU $C_4F_9SO_3$				90 [q,c]			[113]
DBU CF_3SO_3		1.35 [a,c]		900 [e,c]		0.3 [d,c]	[113]
DBU CH_3SO_3		1.22 [d,c]		100 [q,c]			[113]
DBU TFA		1.25 [a,c]		1000 [e,c]		0.1 [d,c]	[113]
DBU acetate		1.1 [a,c]		3000 [e,c]		0.04 [d,c]	[113]
-phosphonium							
tributylphosphonium NTF_2				0.116 [f]		$3x10^{-6}$ [c,h] $1x10^{-3}$ [c,d] 20 [c,g]	[103]
tributylphosphonium Tf						$2x10^{-4}$ [c,g]	[103]
tributylphosphonium CH_3SO_3				0.127 [f]		0.015 [c,h] 0.9 [c,d] 12 [c,h]	[103]
tributylphosphonium nitrate				0.162 [f]		0.04 [c,h] 1 [c,d] 10 [c,v]	[103]
Tributylphosphonium BF_4				100 [d,c]		1 [d,c]	[285]
[P2-EtH][fod]		1.33 [l]		323 [b]			[105]
[P2-EtH][bta]		1.28 [l]		509 [b]			[105]
[P2-EtH][tta]		1.32 [l]		211 [b]			[105]

[h] -20 °C, [a] 25 °C, [b] 23 °C, [e] 27 °C, [d] 30 °C, [j] 60 °C, [f] 80 °C, [j] 120 °C, [g] 130 °C, [m] RT, [p] 140 °C, [q] 90 °C, [r] 50 °C, [s] 65 °C, [t] 45 °C, [u] 150 °C, [v] 100 °C, [w] 35 °C, [y] 55 °C, [z] 20 °C, [aa] 40 °C

[c] Estimated from figure in reference

[i] subcooled state

[k] equimolar acid and bases added to make the PILs. Actual base/acid ratios of dried PILs determined to be between 1:1 and 1.49:1.

[l] temperature not mentioned

(Nb. Ref [103] has graph with many different temperatures in range from -20 to 130 for conductivity, incl. at 80C to match the visc.)

[z] Calculated from equation contained in reference

[bb] Reduced pressure of 0.1 MPa

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