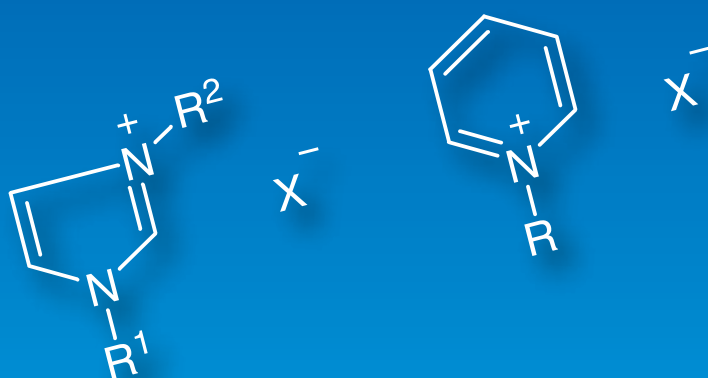


# Ionic Liquids



Ammonium Salts

Imidazolium Salts

Morpholinium Salts

Phosponium Salts

Piperidinium Salts

Pyridinium Salts

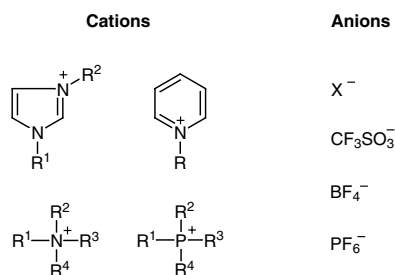
Pyrrolidinium Salts

Sulfonium Salts



# Ionic Liquids

In recent years, environmentally-friendly reaction processes have vigorously been studied from the standpoint of green chemistry. For example, oxidation reactions with the air, or reactions in water, supercritical fluids, and fluorosolvents are cited. Most recently, ionic liquids have gained much attention as green reaction solvents for organic synthesis.



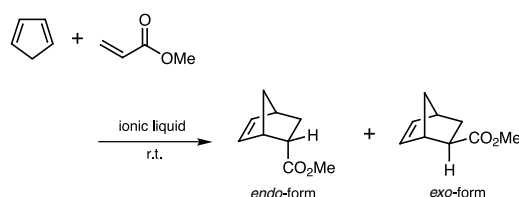
As seen above, ionic liquids are salts, consisting of cations such as imidazolium, pyridinium, quaternary ammonium and quaternary phosphonium, and anions such as halogen, triflate, tetrafluoroborate and hexafluorophosphate, which exist in the liquid state at relatively low temperatures. Their characteristic features include almost no vapor pressure, non-flammability, non-combustibility, high thermal stability, relatively low viscosity, wide temperature ranges for being liquids, and high ionic conductivity. When an ionic liquid is used as a reaction solvent, the solute is solvated by ions only, where the reaction proceeds under quite different conditions as compared to using water or ordinary organic solvents. Hence, they are expected to exhibit unconventional reactivity, and their applications in a variety of organic reactions are being explored.

Ionic liquids containing chloroaluminate as the anion have been investigated for many years. These ionic liquids are not only used as reaction solvents, but also exhibit Lewis acid or Lewis base properties, when the ratio of cations and anions is changed. However, they can only be used under an inert atmosphere or vacuum, due to their high moisture sensitivity. On the other hand, it has been found that ionic liquids containing anions such as hexafluorophosphate form stable salts in air, which lead to the synthesis of numerous stable ionic liquids today. Furthermore, some ionic liquids have very low solubility in water and polar organic solvents. Utilization of this property enables recovery and reuse of ionic liquids, after extracting the product with an organic solvent. That can help to reduce the waste of traditional solvents which are rarely reused. Moreover, ionic liquids have attracted much attention as safe solvents, due to their low volatility.

The followings are some reaction examples using ionic liquids.

## 1. Diels-Alder reaction

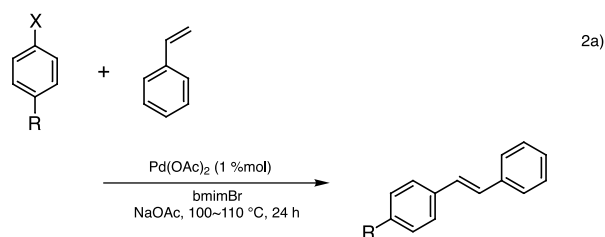
The Diels-Alder reaction between cyclopentadiene and methyl acrylate ester has been reported. In the Diels-Alder reaction using 1-ethyl-3-methylimidazolium chloride / chloroaluminate [emimCl/(AlCl<sub>3</sub>)<sub>x</sub>], the *endo* / *exo* ratio of the products varies largely, depending on the ratio of emimCl/(AlCl<sub>3</sub>)<sub>x</sub>. The amount of *endo*-form increases four-fold with the acidic emimCl/(AlCl<sub>3</sub>)<sub>x</sub>, compared to that of the basic emimCl/(AlCl<sub>3</sub>)<sub>x</sub>.<sup>1a)</sup> When the same reaction is carried out with 1-butyl-3-methylimidazolium tetrafluoroborate (bmimBF<sub>4</sub>), it showed similar reactivity to Lewis basic emimCl/(AlCl<sub>3</sub>)<sub>x</sub>.<sup>1b)</sup>



ionic liquids	composition (% AlCl <sub>3</sub> )	time (h)	<i>endo</i> / <i>exo</i> ratio	Y. (%)
emimCl/(AlCl <sub>3</sub> ) <sub>x</sub>	48 (basic)	22	4.88	32.3 <sup>1a)</sup>
emimCl/(AlCl <sub>3</sub> ) <sub>x</sub>	48 (basic)	72	5.25	95 <sup>1a)</sup>
emimCl/(AlCl <sub>3</sub> ) <sub>x</sub>	51 (acidic)	22	19	53 <sup>1a)</sup>
emimCl/(AlCl <sub>3</sub> ) <sub>x</sub>	51 (acidic)	72	19	79.4 <sup>1a)</sup>
bmimBF <sub>4</sub>	-	72	4.3	91 <sup>1b)</sup>

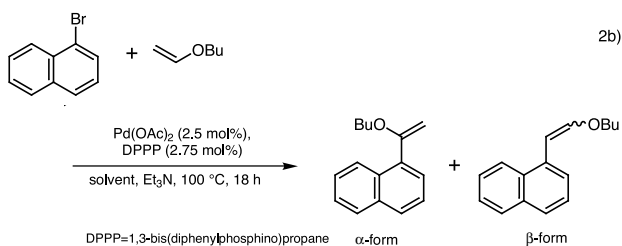
## 2. Heck reaction

In the Heck reaction using palladium catalysts, polar solvents such as DMF and acetonitrile are employed, and aryl iodides are normally used as substrates. In cases where the less expensive but less reactive aryl bromides or chlorides are employed, it is necessary to use more active catalysts or add phosphine ligands in order to retain the catalytic activity. By utilizing 1-butyl-3-methylimidazolium bromide (bmimBr) as solvent, aryl bromides react with styrene to afford stilbenes in high yields without adding a phosphine ligand.<sup>2a)</sup>



entry	X	R	conv. (%)	Y. (%)
1	I	H	100	99
2	Br	CHO	100	90
3	Br	MeCO	79	88

The reaction of enol ethers bearing an electron donating group with aryl halides generates a mixture of  $\alpha$ -substituents and  $\beta$ -substituents under the normal Heck reaction conditions. However, the reaction of vinyl ethers with aryl halides using bmimBF<sub>4</sub> as solvent gives only  $\alpha$ -substituents specifically.<sup>2b)</sup> In addition, the Heck reaction employing tetrabutylammonium bromide (Bu<sub>4</sub>NBr), which is a quaternary ammonium salt, has been reported.<sup>2c)</sup>

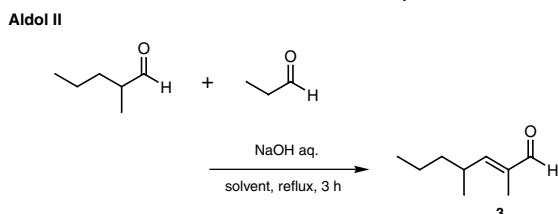
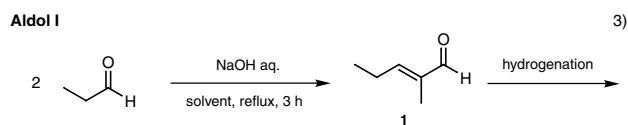


entry	solvent	conv. (%)	$\alpha/\beta$	E/Z	Y. (%)
1	toluene	23	46/54	68/32	
2	DMSO	100	75/25	79/21	
3	bmimBF <sub>4</sub>	50	>99/1		
4*	bmimBF <sub>4</sub>	100	>99/1		95

\*DPPPP (2 eq.), time : 24 h

### 3. Aldol condensation

The Aldol condensation reaction using ionic liquids has been reported. In the reaction for obtaining 2,4-dimethylhept-2-enal **3** from propanal via two Aldol condensations, the conversion values of the ionic liquid phase is comparable to water medium in the Aldol I reaction. However, the product selectivity is reduced, as can be seen in the figure below. This is due to a side reaction proceeding from the high solubility of product **1** toward the ionic liquid. In contrast, in the Aldol II reaction, as compared with the reaction in water, the product selectivity in ionic liquids are increased. This is because the hydrogenated product of **1** is difficult to dissolve in water but easy in ionic liquids.<sup>3)</sup>

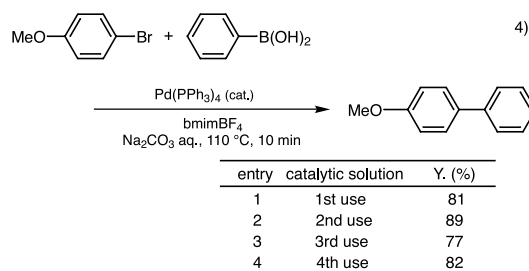


entry	solvent	reaction type	conv. (%)	selectivity (%)			
				1	2*	3	4**
1	bmimBF <sub>4</sub>	Aldol I	99	64	2	-	33
2	H <sub>2</sub> O	Aldol I	100	82	0	-	18
3	emimBF <sub>4</sub>	Aldol II	100	4	6	69	21
4	bmimBF <sub>4</sub>	Aldol II	100	3	3	80	14
5	H <sub>2</sub> O	Aldol II	100	36	0	59	5

\*2: 3-hydroxy-2-methylpentanal, \*\*4: higher boiling aldehydes and oligomers.

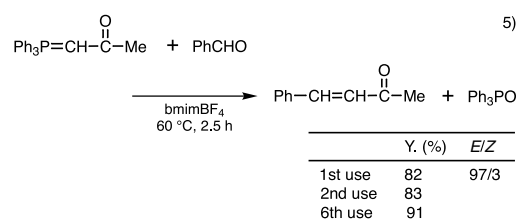
### 4. Suzuki-Miyaura coupling reaction

In the Suzuki-Miyaura coupling reaction where biaryls are produced from aryl halides and aryl boronic acids in the presence of a palladium catalyst and a base, the removal of the catalyst is often a problem. In the system where an ionic liquid is used as solvent, the product can be extracted with ether after the reaction is complete, with the catalyst being retained in the ionic liquid. The ionic liquid and the catalyst can then be reused as they are.<sup>4)</sup>



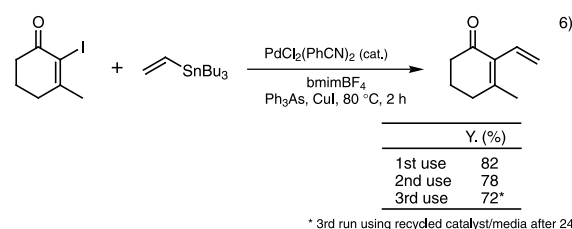
### 5. Wittig reaction

The Wittig reaction is a useful method for C-C double bond formation. However, the separation of the product and the by-product, triphenylphosphine oxide, is a classic problem. The separation and purification are usually carried out by crystallization or chromatography. When an ionic liquid is used as solvent, the product and phosphine oxide can be easily separated by combining an ether extraction and a toluene extraction after the reaction is complete. In addition, it is possible to efficiently reuse the ionic liquid.<sup>5)</sup>



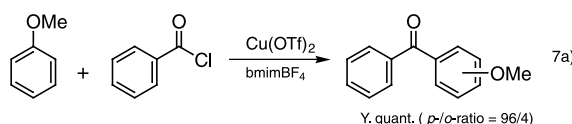
### 6. Stille reaction

The Stille reaction is a useful reaction, where an organotin compound and an electrophilic reagent are reacted to form a C-C bond under mild conditions in the presence of palladium catalyst. In the reaction of vinyltributyltin and iodocyclohexenone in an ionic liquid, the product can be extracted with ether, and the catalyst is retained in the ionic liquid. The ionic liquid and the catalyst can be reused as they are. This ionic liquid / catalyst phase is air and moisture stable, and thus can be used after a long storage without loss in activity.<sup>6)</sup>



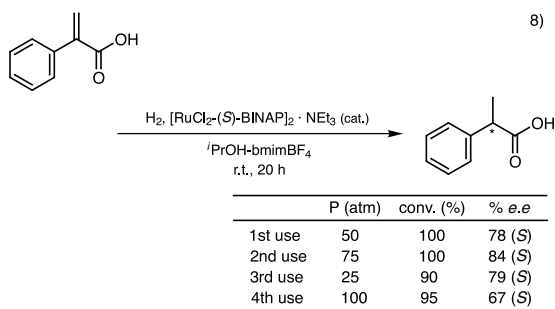
### 7. Friedel-Crafts reaction

Here is an example of the Friedel-Crafts reaction. In the benzoylation of anisoles catalyzed by copper triflate in bmimBF<sub>4</sub>, methoxybenzophenone is quantitatively obtained within 1h, with a *p*- / *o*-product ratio of 96/4.<sup>7a)</sup> The same reaction performed using acetonitrile gave a lower conversion of 64% at 1h, with the reduced *p*- / *o*-product ratio of 93/7. In addition, the regioselective acylations of indoles using emimCl/(AlCl<sub>3</sub>)<sub>x</sub> has been reported as well.<sup>7b)</sup>



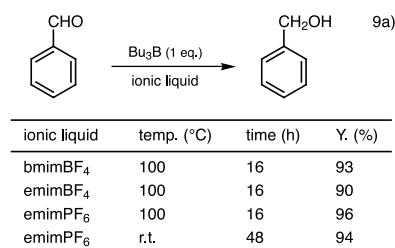
## 8. Hydrogenation

In the asymmetric hydrogenation of C-C double bond using homogeneous chiral transition metal complexes, the recovery of the catalyst and the separation of the products are often troublesome.<sup>8)</sup> Dupont *et al.* have reported an example in which the reagents are allowed to react in a two phase system of an ionic liquid and an alcohol. After the reaction is complete, the product exists in the alcoholic phase, while the catalyst in the ionic liquid phase. Thus, the product and the catalyst can be easily separated by decantation. In addition, the catalyst which exists in the ionic liquid phase can be reused without loss in activity.



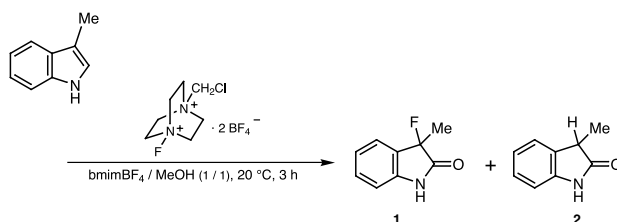
## 9. Reduction

The reduction of aldehydes using trialkylboranes is an important organic transformation reaction. However, reductions using simple trialkylboranes generally require reaction temperatures in excess of 150 °C. Kabalka *et al.* have reported this reduction using trialkylborane in which bmimBF<sub>4</sub>, emimBF<sub>4</sub>, and 1-ethyl-3-methylimidazolium hexafluorophosphate (emimPF<sub>6</sub>) are used as solvents.<sup>9a)</sup> For example, when benzaldehyde was reduced by tributylborane in emimPF<sub>6</sub>, the reaction proceeded rapidly at 100 °C to give the product in high yield. Although long reaction time is needed comparatively, the product can be obtained even at room temperature. In addition, a photoreduction has also been reported using ionic liquids.<sup>9b)</sup>



## 10. Fluorination

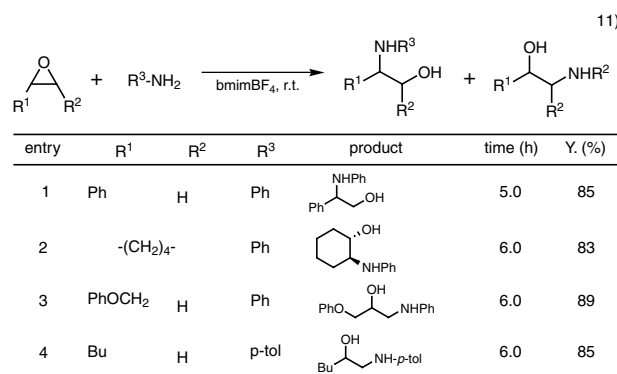
The introduction of fluorines in to heterocyclic compounds is important in the synthesis of bioactive compounds. In the electrophilic fluorination of indoles using *N*-fluoro-*N'*-(chloromethyl)triethylenediamine bis(tetrafluoroborate) as fluorinating agent and bmimBF<sub>4</sub> as a solvent, 3-fluorinated 2-oxindoles can be obtained in high yield in a short period of time compared to the conventional method (entry 1).<sup>10)</sup>



entry	solvent	cosolvent (1/1)	temp. (°C)	time (h)	1 (%)	2 (%)
1	MeCN	H <sub>2</sub> O	r.t.	overnight	71	small amount <sup>10a)</sup>
2	bmimBF <sub>4</sub>	MeOH	20	3	99	- <sup>10b)</sup>

## 11. Ring opening reaction

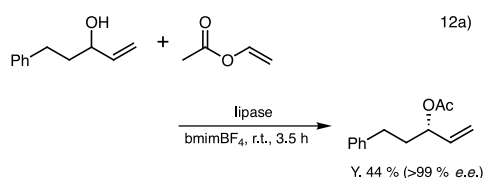
$\beta$ -Aminoalcohols are utilized as useful building blocks for the synthesis of bioactive compounds. One of the synthetic methods to obtain  $\beta$ -aminoalcohols involves the ring opening of epoxides using amines. However, these reactions require a large excess of the amines at elevated temperatures. The high temperature reaction conditions are not only detrimental to certain functional groups but also to the control of regioselectivity. Subsequently, a variety of activators or promoters such as metal amides, metal triflates and transition metal halides have been developed. However, many of these are often expensive or are needed in stoichiometric amounts, thus limiting their practicality. In the system using ionic liquids, the reaction proceeds at room temperature to give  $\beta$ -aminoalcohols in high yield.<sup>11)</sup>



In the cases of glycidyl ether or alkyloxiranes in entry 3 and 4, amines attack on the less sterically hindered site on the epoxides. After the reaction, the product was extracted with ether, followed by drying at 80 °C under reduced pressure. The ionic liquid was reused in five runs without any loss of activity.

## 12. Enzymatic reaction

Enzymatic reactions using ionic liquids have also been reported.<sup>12)</sup> It is known that lipase tolerates non-natural reaction conditions, and reactions in organic solvents have intensively been carried out. For example, transesterifications in organic solvents are well known as a useful synthetic methods for the preparation of optically-active compounds. In the asymmetric transesterification of allylic alcohols using ionic liquids, the desired products are afforded in similar yields to those of organic solvent systems.<sup>12a)</sup>



As described above, a variety of reactions utilizing ionic liquids have been conducted, and the improvement of yields and the recovery and reuse of solvents have been reported. Furthermore, they are also applied to alkylations<sup>13</sup>, allylations<sup>14</sup>, epoxidations<sup>15</sup>, cycloadditions<sup>16</sup>, hydroesterifications<sup>17</sup>, and reactions using supercritical CO<sub>2</sub><sup>18</sup>, in which they are reported to be effective.

### 13. Other application

Ionic liquids are attracting attention in electrochemical application, because they consist of only ions and have high ionic conductivity. For example, they have been extensively studied as secondary battery electrolytes. These electrolytes require properties such as high ionic conductivity, non-volatility, thermal stability, non-flammability, and non-corrosiveness. Ionic liquids meet these requirements. Moreover, 1-alkyl-3-methylimidazolium iodide has been recently examined as an electrolyte of dye-sensitized solar cells.<sup>19</sup>

Recently Hamaguchi *et al.* reported that 1-butyl-3-methylimidazolium tetrachloroferrate is magnetic ionic liquid.<sup>20</sup> Traditional magnetic fluids have had problems of volatility and phase separation. The new magnetic ionic liquid overcomes these problems, and is expected to be applied to many fields, including the use as a sealing agent for the motor axis.

#### References

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- 2) a) L. Xu, W. Chen, J. Xiao, *Organometallics* **2000**, *19*, 1123; b) L. Xu, W. Chen, J. Ross, J. Xiao, *Org. Lett.* **2001**, *3*, 295; c) V. P. W. Böhm, W.

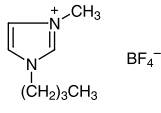
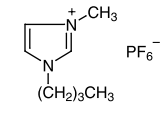
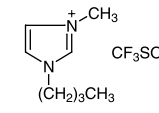
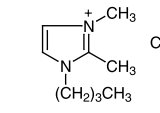
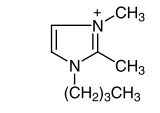
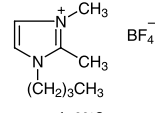
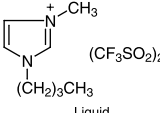
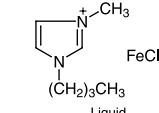
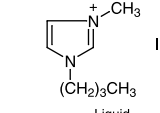
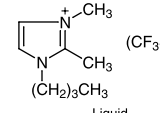
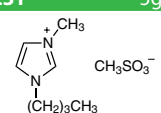
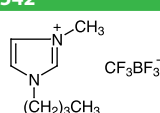
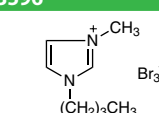
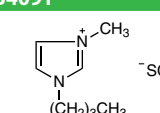
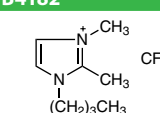
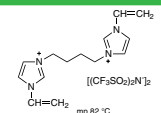
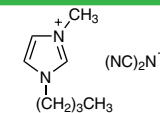
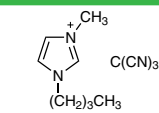
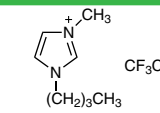
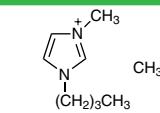
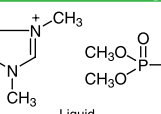
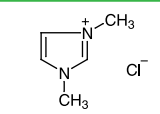
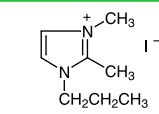
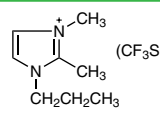
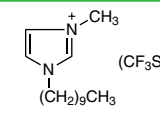
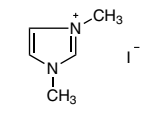
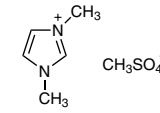
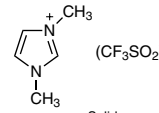
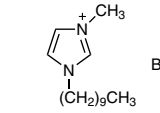
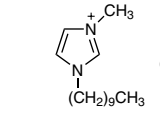
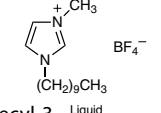
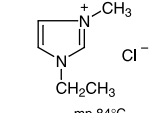
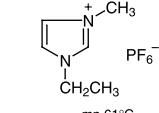
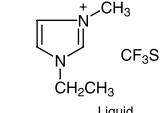
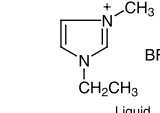
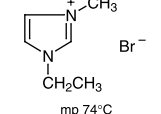
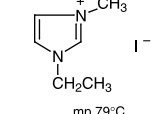
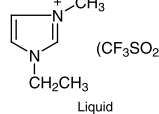
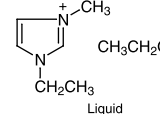
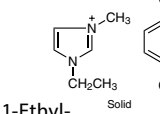
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## Ammonium Salts

<b>Ammonium Salts</b>		A2274 5g	$\begin{array}{c} \text{CH}_2\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_4\text{N}^+\text{CH}_2\text{CH}_2\text{CH}_3 \\   \\ \text{CH}_2\text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Amyltrimethylammonium Bis(trifluoromethanesulfonyl)- imide [906478-91-9]	B3233 5g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+\text{CH}_3 \\   \\ \text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Butyltrimethylammonium Bis(trifluoromethanesulfonyl)- imide [258273-75-5]	B5427 5g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3\text{CH}_2\text{N}^+\text{CH}_2\text{C}_6\text{H}_5 \\   \\ \text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Benzyl(ethyl)- dimethylammonium Bis(trifluoromethanesulfonyl)- imide [1186103-43-4]		
C1966 5g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{C}_6\text{H}_{11}\text{N}^+\text{CH}_3 \\   \\ \text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Solid} \end{array}$ Cyclohexyltrimethylammonium Bis(trifluoromethanesulfonyl)- imide [952155-74-7]	D5237 1g	$\begin{array}{c} \text{CH}_2\text{CH}_3 \\   \\ \text{CH}_3\text{N}^+\text{CH}_2\text{CH}_2\text{CH}_3 \\   \\ \text{CH}_2\text{CH}_3 \\ (\text{FSO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Diethyl(methyl)- propylammonium Bis(fluorosulfonyl)imide [1235234-32-8]	D5238 1g	$\begin{array}{c} \text{CH}_2\text{CH}_3 \\   \\ \text{CH}_3\text{N}^+\text{CH}_2\text{CH}_2\text{OCH}_3 \\   \\ \text{CH}_2\text{CH}_3 \\ (\text{FSO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Diethyl(2-methoxyethyl)- methylammonium Bis(fluorosulfonyl)imide [1079129-48-8]	E1275 1g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3\text{CH}_2\text{N}^+\text{CH}_2\text{CH}_2\text{OCH}_3 \\   \\ \text{CH}_3 \\ (\text{FSO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Ethyl(2-methoxyethyl)- dimethylammonium Bis(fluorosulfonyl)imide [1235234-35-1]	E1281 5g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3\text{CH}_2\text{N}^+\text{CH}_2\text{CH}_2\text{OCH}_3 \\   \\ \text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Ethyl(2-methoxyethyl)- dimethylammonium Bis(trifluoromethanesulfonyl)- imide [557788-37-1]
E1282 5g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3\text{CH}_2\text{N}^+(\text{CH}_2)_3\text{OCH}_3 \\   \\ \text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Ethyl(3-methoxypropyl)- dimethylammonium Bis(trifluoromethanesulfonyl)- imide [1373334-05-4]	E1283 1g 5g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3\text{CH}_2\text{N}^+\text{CH}_2\text{CH}_2\text{C}_6\text{H}_5 \\   \\ \text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Ethyl(dimethyl)- (2-phenylethyl)ammonium Bis(trifluoromethanesulfonyl)- imide [1804970-28-2]	M1660 5g	$\begin{array}{c} (\text{CH}_2)_7\text{CH}_3 \\   \\ \text{CH}_3\text{N}^+(\text{CH}_2)_7\text{CH}_3 \\   \\ (\text{CH}_2)_7\text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Methyltri- <i>n</i> -octylammonium Bis(trifluoromethanesulfonyl)- imide [375395-33-8]	T0054 25g 100g 500g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{mp } 103^\circ\text{C} \end{array}$ Tetrabutylammonium Bromide [1643-19-2]	T0055 5g 25g 100g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{mp } 70^\circ\text{C} \end{array}$ Tetrabutylammonium Chloride [1112-67-0]
T0057 25g 100g 500g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{mp } 147^\circ\text{C} \end{array}$ Tetrabutylammonium Iodide [311-28-4]	T0914 25g 100g 500g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{mp } 161^\circ\text{C} \end{array}$ Tetrabutylammonium Tetrafluoroborate [429-42-5]	T1010 5g 25g	$\begin{array}{c} (\text{CH}_2)_5\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_5\text{N}^+(\text{CH}_2)_5\text{CH}_3 \\   \\ (\text{CH}_2)_5\text{CH}_3 \\ \text{mp } 100^\circ\text{C} \end{array}$ Tetrahexylammonium Iodide [2138-24-1]	T1011 5g 25g	$\begin{array}{c} (\text{CH}_2)_4\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_4\text{N}^+(\text{CH}_2)_4\text{CH}_3 \\   \\ (\text{CH}_2)_4\text{CH}_3 \\ \text{mp } 137^\circ\text{C} \end{array}$ Tetraamylammonium Iodide [2498-20-6]	T1155 5g	$\begin{array}{c} (\text{CH}_2)_7\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_7\text{N}^+(\text{CH}_2)_7\text{CH}_3 \\   \\ (\text{CH}_2)_7\text{CH}_3 \\ \text{mp } 129^\circ\text{C} \end{array}$ Tetra- <i>n</i> -octylammonium Iodide [16829-91-7]
T1279 25g 250g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{Solid} \end{array}$ Tetrabutylammonium Hexafluorophosphate [3109-63-5]	T1396 25g	$\begin{array}{c} (\text{CH}_2)_6\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_6\text{N}^+(\text{CH}_2)_6\text{CH}_3 \\   \\ (\text{CH}_2)_6\text{CH}_3 \\ \text{mp } 123^\circ\text{C} \end{array}$ Tetraheptylammonium Iodide [3535-83-9]	T1432 5g 25g	$\begin{array}{c} (\text{CH}_2)_4\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_4\text{N}^+(\text{CH}_2)_4\text{CH}_3 \\   \\ (\text{CH}_2)_4\text{CH}_3 \\ \text{mp } 101^\circ\text{C} \end{array}$ Tetraamylammonium Bromide [866-97-7]	T1433 5g 25g	$\begin{array}{c} (\text{CH}_2)_4\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_4\text{N}^+(\text{CH}_2)_4\text{CH}_3 \\   \\ (\text{CH}_2)_4\text{CH}_3 \\ \text{Solid} \end{array}$ Tetraamylammonium Chloride [4965-17-7]	T1568 10g 25g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{mp } 113^\circ\text{C} \end{array}$ Tetrabutylammonium Triflate [35895-70-6]
T1599 25g	$\begin{array}{c} (\text{CH}_2)_5\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_5\text{N}^+(\text{CH}_2)_5\text{CH}_3 \\   \\ (\text{CH}_2)_5\text{CH}_3 \\ \text{mp } 99^\circ\text{C} \end{array}$ Tetrahexylammonium Bromide [4328-13-6]	T1602 5g 25g	$\begin{array}{c} (\text{CH}_2)_6\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_6\text{N}^+(\text{CH}_2)_6\text{CH}_3 \\   \\ (\text{CH}_2)_6\text{CH}_3 \\ \text{mp } 89^\circ\text{C} \end{array}$ Tetraheptylammonium Bromide [4368-51-8]	T1603 10g 25g	$\begin{array}{c} (\text{CH}_2)_7\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_7\text{N}^+(\text{CH}_2)_7\text{CH}_3 \\   \\ (\text{CH}_2)_7\text{CH}_3 \\ \text{mp } 97^\circ\text{C} \end{array}$ Tetra- <i>n</i> -octylammonium Bromide [14866-33-2]	T2106 25g	$\begin{array}{c} \text{CH}_2\text{CH}_2\text{CH}_3 \\   \\ \text{CH}_3\text{CH}_2\text{CH}_2\text{N}^+\text{CH}_2\text{CH}_2\text{CH}_3 \\   \\ \text{CH}_2\text{CH}_2\text{CH}_3 \\ \text{Solid} \end{array}$ Tetrapropylammonium Chloride [5810-42-4]	T2679 5g 25g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Tributylmethylammonium Bis(trifluoromethanesulfonyl)- imide [405514-94-5]
T2694 25g 100g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{Solid} \end{array}$ Tetrabutylammonium Acetate [10534-59-5]	T2761 5g 25g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3\text{N}^+\text{CH}_2\text{CH}_2\text{CH}_3 \\   \\ \text{CH}_3 \\ (\text{CF}_3\text{SO}_2)_2\text{N}^- \\ \text{Liquid} \end{array}$ Trimethylpropylammonium Bis(trifluoromethanesulfonyl)- imide [268536-05-6]	T3533 5g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ (\text{NC})_2\text{N}^- \\ \text{Liquid} \end{array}$ Tributyl(methyl)- ammonium Dicyanamide [1262230-03-4]	T3660 5g 25g	$\begin{array}{c} (\text{CH}_2)_3\text{CH}_3 \\   \\ \text{CH}_3(\text{CH}_2)_3\text{N}^+(\text{CH}_2)_3\text{CH}_3 \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{mp } 69^\circ\text{C} \end{array}$ Tetrabutylammonium <i>p</i> -Toluenesulfonate [7182-86-7]		
<b>Imidazolium Salts</b>		A2084 5g 25g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{Imidazolium}^+ \\   \\ \text{CH}_2\text{CH}=\text{CH}_2 \\ \text{Liquid} \end{array}$ 1-Allyl- 3-methylimidazolium Chloride [65039-10-3]	B2193 5g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{Imidazolium}^+ \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{Liquid} \end{array}$ 1-Butyl-3-methyl- imidazolium Bromide [85100-77-2]	B2194 5g 25g 100g	$\begin{array}{c} \text{CH}_3 \\   \\ \text{Imidazolium}^+ \\   \\ (\text{CH}_2)_3\text{CH}_3 \\ \text{mp } 41^\circ\text{C} \end{array}$ 1-Butyl-3-methyl- imidazolium Chloride [79917-90-1]		

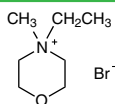
<b>B2195</b> 5g 25g 100g  Liquid 1-Butyl-3-methylimidazolium Tetrafluoroborate [174501-65-6]	<b>B2320</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Hexafluorophosphate [174501-64-5]	<b>B2337</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Trifluoromethanesulfonate [174899-66-2]	<b>B2473</b> 5g 25g  mp 99°C Liquid 1-Butyl-2,3-dimethylimidazolium Chloride [9892-75-2]	<b>B2474</b> 5g 25g  mp 38°C Liquid 1-Butyl-2,3-dimethylimidazolium Hexafluorophosphate [227617-70-1]
<b>B2475</b> 5g 25g  fp 32°C Liquid 1-Butyl-2,3-dimethylimidazolium Tetrafluoroborate [402846-78-0]	<b>B2477</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Bis(trifluoromethanesulfonyl)- imide [174899-83-3]	<b>B2672</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Tetrachloroferrate [359845-21-9]	<b>B2708</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Iodide [65039-05-6]	<b>B3159</b> 5g 25g  Liquid 1-Butyl-2,3-dimethylimidazolium Bis(trifluoromethanesulfonyl)- imide [350493-08-2]
<b>B3231</b> 5g 25g  mp 76°C Liquid 1-Butyl-3-methylimidazolium Methanesulfonate [342789-81-5]	<b>B3542</b> 5g  Liquid 1-Butyl-3-methylimidazolium Trifluoroborate [741677-68-9]	<b>B3596</b> 5g  mp 8°C Liquid 1-Butyl-3-methylimidazolium Tribromide [820965-08-0]	<b>B4091</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Thiocyanate [344790-87-0]	<b>B4182</b> 5g 25g  mp 44°C Liquid 1-Butyl-2,3-dimethylimidazolium Triflate [765910-73-4]
<b>B5421</b> 1g  mp 82°C Liquid 3,3'-(Butane-1,4-diyl)- bis(1-vinyl-3-imidazolium) Bis(trifluoromethanesulfonyl)- imide [1312310-16-9]	<b>B5447</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Dicyanamide [448245-52-1]	<b>B5487</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Tricyanomethanide [878027-73-7]	<b>B5526</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Trifluoroacetate [174899-94-6]	<b>B5527</b> 5g 25g  Liquid 1-Butyl-3-methylimidazolium Methyl Sulfate [401788-98-5]
<b>D3240</b> 5g 25g  Liquid 1,3-Dimethylimidazolium Dimethyl Phosphate [654058-04-5]	<b>D3341</b> 5g 25g  mp 125°C Liquid 1,3-Dimethylimidazolium Chloride [79917-88-7]	<b>D3903</b> 5g 25g  Solid 1,2-Dimethyl-3-propylimidazolium Iodide [218151-78-1]	<b>D4289</b> 5g 25g  Liquid 2,3-Dimethyl-1-propylimidazolium Bis(trifluoromethanesulfonyl)imide [169051-76-7]	<b>D4351</b> 5g 25g  Liquid 1-Decyl-3-methylimidazolium Bis(trifluoromethanesulfonyl)- imide [433337-23-6]
<b>D4654</b> 5g 25g  mp 86°C Liquid 1,3-Dimethylimidazolium Iodide [4333-62-4]	<b>D5348</b> 5g 25g  Liquid 1,3-Dimethylimidazolium Methyl Sulfate [97345-90-9]	<b>D5349</b> 5g 25g  Solid 1,3-Dimethylimidazolium Bis(trifluoromethanesulfonyl)- imide [174899-81-1]	<b>D5350</b> 5g 25g  Liquid 1-Decyl-3-methylimidazolium Bromide [188589-32-4]	<b>D5351</b> 5g 25g  Liquid 1-Decyl-3-methylimidazolium Chloride [171058-18-7]
<b>D5373</b> 5g 25g  Liquid 1-Decyl-3-methylimidazolium Tetrafluoroborate [244193-56-4]	<b>E0490</b> 5g 25g 250g  mp 84°C Liquid 1-Ethyl-3-methylimidazolium Chloride [65039-09-0]	<b>E0493</b> 5g 25g  mp 61°C Liquid 1-Ethyl-3-methylimidazolium Hexafluorophosphate [155371-19-0]	<b>E0494</b> 5g 25g  Liquid 1-Ethyl-3-methylimidazolium Trifluoromethanesulfonate [145022-44-2]	<b>E0496</b> 5g 25g  Liquid 1-Ethyl-3-methylimidazolium Tetrafluoroborate [143314-16-3]
<b>E0543</b> 5g 25g  mp 74°C Liquid 1-Ethyl-3-methylimidazolium Bromide [65039-08-9]	<b>E0556</b> 5g 25g  mp 79°C Liquid 1-Ethyl-3-methylimidazolium Iodide [35935-34-3]	<b>E0599</b> 5g 25g  Liquid 1-Ethyl-3-methylimidazolium Bis(trifluoromethanesulfonyl)- imide [174899-82-2]	<b>E0650</b> 5g 25g  Liquid 1-Ethyl-3-methylimidazolium Ethyl Sulfate [342573-75-5]	<b>E0651</b> 5g 25g  Solid 1-Ethyl-3-methylimidazolium p-Toluenesulfonate [328090-25-1]

<p><b>E0680</b> 1g 5g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Dicyanamide [370865-89-7]</p>	<p><b>E0706</b> 5g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Tetrachloroferrate [850331-04-3]</p>	<p><b>E0753</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-2,3-dimethylimidazolium Bis(trifluoromethanesulfonyl)-imide [174899-90-2]</p>	<p><b>E0754</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Hydrogen Sulfate [412009-61-1]</p>	<p><b>E0755</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Methanesulfonate [145022-45-3]</p>
<p><b>E0775</b> 5g 25g</p> <p>Solid</p> <p>1-Ethyl-3-methylimidazolium Nitrate [143314-14-1]</p>	<p><b>E0776</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Thiocyanate [331717-63-6]</p>	<p><b>E0836</b> 5g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Trifluoro(trifluoromethyl)-borate [681856-28-0]</p>	<p><b>E0883</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Acetate [143314-17-4]</p>	<p><b>E1280</b> 5g</p> <p>Liquid</p> <p>3-Ethyl-1-vinylimidazolium Bis(trifluoromethanesulfonyl)-imide [319476-28-3]</p>
<p><b>E1298</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Tricyanomethanide [666823-18-3]</p>	<p><b>E1307</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Trifluoroacetate [174899-65-1]</p>	<p><b>E1308</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Methyl Sulfate [516474-01-4]</p>	<p><b>E1309</b> 5g 25g</p> <p>Liquid</p> <p>1-Ethyl-3-methylimidazolium Diethyl Phosphate [848641-69-0]</p>	<p><b>H1097</b> 5g 25g</p> <p>Liquid</p> <p>1-Hexyl-3-methylimidazolium Chloride [171058-17-6]</p>
<p><b>H1098</b> 5g 25g</p> <p>Liquid</p> <p>1-Hexyl-3-methylimidazolium Hexafluorophosphate [304680-35-1]</p>	<p><b>H1099</b> 5g 25g</p> <p>Liquid</p> <p>1-Hexyl-3-methylimidazolium Tetrafluoroborate [244193-50-8]</p>	<p><b>H1100</b> 5g 25g</p> <p>Liquid</p> <p>1-Hexyl-3-methylimidazolium Triflate [460345-16-8]</p>	<p><b>H1227</b> 5g 25g</p> <p>Liquid</p> <p>1-Hexyl-3-methylimidazolium Bromide [85100-78-3]</p>	<p><b>H1254</b> 5g 25g</p> <p>Liquid</p> <p>1-(2-Hydroxyethyl)-3-methylimidazolium Chloride [61755-34-8]</p>
<p><b>H1286</b> 5g</p> <p>Solid</p> <p>1-Hexyl-2,3-dimethylimidazolium Iodide [288627-94-1]</p>	<p><b>H1423</b> 5g 25g</p> <p>Liquid</p> <p>1-Hexyl-3-methylimidazolium Bis(trifluoromethanesulfonyl)-imide [382150-50-7]</p>	<p><b>H1492</b> 5g 25g</p> <p>Liquid</p> <p>1-(2-Hydroxyethyl)-3-methylimidazolium Tetrafluoroborate [374564-83-7]</p>	<p><b>H1633</b> 5g 25g</p> <p>Liquid</p> <p>1-Hexyl-3-methylimidazolium Iodide [178631-05-5]</p>	<p><b>M1440</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-propylimidazolium Iodide [119171-18-5]</p>
<p><b>M1904</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-n-octylimidazolium Bromide [61545-99-1]</p>	<p><b>M2062</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-n-octylimidazolium Chloride [64697-40-1]</p>	<p><b>M2063</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-n-octylimidazolium Hexafluorophosphate [304680-36-2]</p>	<p><b>M2440</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-n-octylimidazolium Triflate [403842-84-2]</p>	<p><b>M2732</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-n-octylimidazolium Tetrafluoroborate [244193-52-0]</p>
<p><b>M3034</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-propylimidazolium Bromide [85100-76-1]</p>	<p><b>M3035</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-propylimidazolium Chloride [79917-89-8]</p>	<p><b>M3036</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-propylimidazolium Tetrafluoroborate [244193-48-4]</p>	<p><b>M3037</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-pentylimidazolium Bromide [343851-31-0]</p>	<p><b>M3038</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-pentylimidazolium Tetrafluoroborate [244193-49-5]</p>
<p><b>M3039</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-n-octylimidazolium Bis(trifluoromethanesulfonyl)-imide [178631-04-4]</p>	<p><b>M3059</b> 5g 25g</p> <p>Liquid</p> <p>1-Methyl-3-propylimidazolium Bis(trifluoromethanesulfonyl)-imide [216299-72-8]</p>	<p><b>V0145</b> 5g</p> <p>Liquid</p> <p>1-Vinylimidazolium Bis(trifluoromethanesulfonyl)-imide [1013027-27-4]</p>		



## Morpholinium Salts

E1166 5g 25g

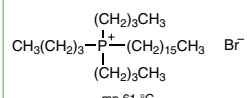


mp 177 °C

4-Ethyl-4-methylmorpholinium Bromide [65756-41-4]

## Phosponium Salts

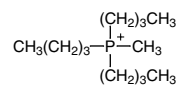
H1047 25g 100g



mp 61 °C

Tributylhexadecylphosphonium Bromide [14937-45-2]

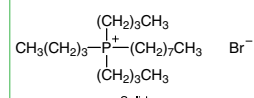
M1455 5g 25g



Solid

Tributylmethylphosphonium Iodide [1702-42-7]

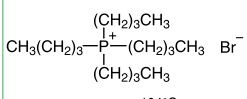
O0297 25g



Solid

Tributyl-n-octylphosphonium Bromide [57702-65-5]

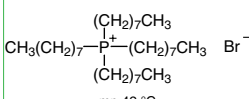
T1124 25g 100g 500g



mp 104 °C

Tetrabutylphosphonium Bromide [3115-68-2]

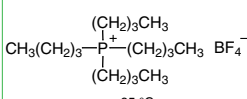
T1650 25g



mp 42 °C

Tetra-n-octylphosphonium Bromide [23906-97-0]

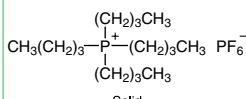
T2006 25g



mp 95 °C

Tetrabutylphosphonium Tetrafluoroborate [1813-60-1]

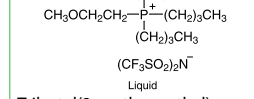
T2007 5g 25g



Solid

Tetrabutylphosphonium Hexafluorophosphate [111928-21-3]

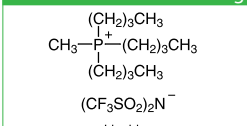
T2564 5g



Liquid

Tributyl(2-methoxyethyl)-phosphonium Bis(trifluoromethanesulfonyl)-imide [959698-44-3]

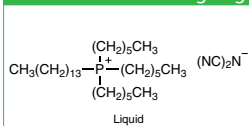
T2680 5g



Liquid

Tributylmethylphosphonium Bis(trifluoromethanesulfonyl)-imide [324575-10-2]

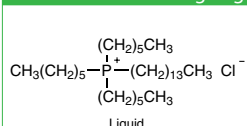
T3534 5g 25g



Liquid

Trihexyl(tetradecyl)-phosphonium Dicyanamide [701921-71-3]

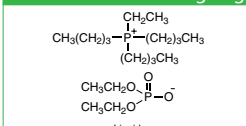
T3623 5g 25g



Liquid

Trihexyl(tetradecyl)-phosphonium Chloride [258864-54-9]

T3641 5g 25g

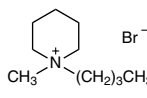


Liquid

Tributyl(ethyl)-phosphonium Diethyl Phosphate [20445-94-7]

## Piperidinium Salts

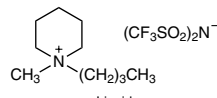
B3424 5g 25g



Solid

1-Butyl-1-methylpiperidinium Bromide [94280-72-5]

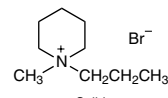
B4844 5g 25g



Liquid

1-Butyl-1-methylpiperidinium Bis(trifluoromethanesulfonyl)-imide [623580-02-9]

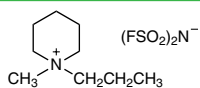
M1976 5g 25g



Solid

1-Methyl-1-propylpiperidinium Bromide [88840-42-0]

M2981 1g

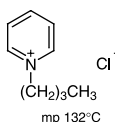


Liquid

1-Methyl-1-propylpiperidinium Bis(fluorosulfonyl)imide [911303-46-3]

## Pyridinium Salts

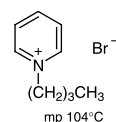
B1329 10g 25g



mp 132 °C

1-Butylpyridinium Chloride [1124-64-7]

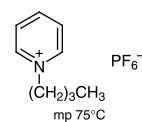
B1743 5g 25g



mp 104 °C

1-Butylpyridinium Bromide [874-80-6]

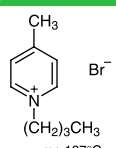
B2196 5g 25g



mp 75 °C

1-Butylpyridinium Hexafluorophosphate [186088-50-6]

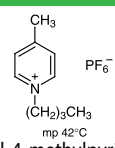
B2700 5g 25g



mp 137 °C

1-Butyl-4-methylpyridinium Bromide [65350-59-6]

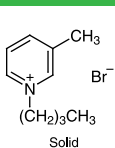
B2701 5g 25g



mp 42 °C

1-Butyl-4-methylpyridinium Hexafluorophosphate [401788-99-6]

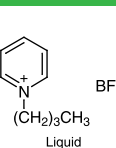
B3104 5g 25g



Solid

1-Butyl-3-methylpyridinium Bromide [26576-85-2]

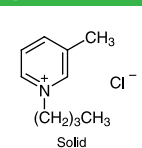
B3232 5g 25g



Liquid

1-Butylpyridinium Tetrafluoroborate [203389-28-0]

B3425 1g 5g



Solid

1-Butyl-3-methylpyridinium Chloride [125652-55-3]

<p><b>B3426</b> 5g 25g</p> <p>1-Butyl-4-methylpyridinium Chloride [112400-86-9]</p>	<p><b>B5570</b> 5g 25g</p> <p>1-Butyl-4-methylpyridinium Tetrafluoroborate [343952-33-0]</p>	<p><b>B5571</b> 5g 25g</p> <p>1-Butylpyridinium Bis(trifluoromethanesulfonyl)imide [187863-42-9]</p>	<p><b>B5763</b> 1g 5g</p> <p>1-Butyl-4-methylpyridinium Bis(trifluoromethanesulfonyl)imide [475681-62-0]</p>	<p><b>E0171</b> 25g</p> <p>1-Ethylpyridinium Bromide [1906-79-2]</p>	
<p><b>E0544</b> 5g 25g</p> <p>1-Ethylpyridinium Chloride [2294-38-4]</p>	<p><b>E0681</b> 5g 25g</p> <p>1-Ethyl-3-methylpyridinium Ethyl Sulfate [872672-50-9]</p>	<p><b>E0682</b> 5g</p> <p>1-Ethyl-3-(hydroxymethyl)pyridinium Ethyl Sulfate</p>	<p><b>E0756</b> 5g</p> <p>1-Ethyl-3-methylpyridinium Bis(trifluoromethanesulfonyl)imide [841251-37-4]</p>	<p><b>E1240</b> 1g 5g</p> <p>1-Ethyl-2-methylpyridinium Bromide [32353-50-7]</p>	
<p><b>E1272</b> 5g 25g</p> <p>1-Ethyl-4-methylpyridinium Bromide [32353-49-4]</p>	<p><b>H1424</b> 5g 25g</p> <p>1-Hexylpyridinium Hexafluorophosphate [797789-00-5]</p>	<p><b>P1393</b> 5g</p> <p>1-Propylpyridinium Chloride [23271-47-8]</p>			
<p><b>Pyrrolidinium Salts</b></p>					
<p><b>B3427</b> 5g 25g</p> <p>1-Butyl-1-methylpyrrolidinium Bromide [93457-69-3]</p>	<p><b>B5398</b> 5g</p> <p>1-Butyl-1-methylpyrrolidinium Bis(fluorosulfonyl)imide [1057745-51-3]</p>	<p><b>B5453</b> 5g 25g</p> <p>1-Butyl-1-methylpyrrolidinium Dicyanamide [370865-80-8]</p>	<p><b>B5568</b> 5g 25g</p> <p>1-Butyl-1-methylpyrrolidinium Triflate [367522-96-1]</p>	<p><b>E0977</b> 5g 25g</p> <p>1-Ethyl-1-methylpyrrolidinium Tetrafluoroborate [117947-85-0]</p>	
<p><b>E1050</b> 5g 25g</p> <p>1-Ethyl-1-methylpyrrolidinium Bromide [69227-51-6]</p>	<p><b>M2098</b> 5g 25g</p> <p>1-Methyl-1-propylpyrrolidinium Bis(trifluoromethanesulfonyl)imide [223437-05-6]</p>	<p><b>M2980</b> 5g</p> <p>1-Methyl-1-propylpyrrolidinium Bis(fluorosulfonyl)imide [852620-97-4]</p>	<p><b>M2998</b> 1g 5g</p> <p>1-(2-Methoxyethyl)-1-methylpyrrolidinium Bis(fluorosulfonyl)imide [1235234-47-5]</p>		
<p><b>Sulfonium Salts</b></p>					
<p><b>T1056</b> 25g 500g</p> <p>Trimethylsulfonium Iodide [2181-42-2]</p>	<p><b>T1564</b> 1g</p> <p>Tributylsulfonium Iodide [18146-62-8]</p>	<p><b>T2314</b> 5g</p> <p>Triethylsulfonium Bis(trifluoromethanesulfonyl)imide [321746-49-0]</p>			

The melting points are shown as the reference value. These are not specification value.  
The salts that form liquid or solid state at room temperature are given the description "liquid" or "solid".

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