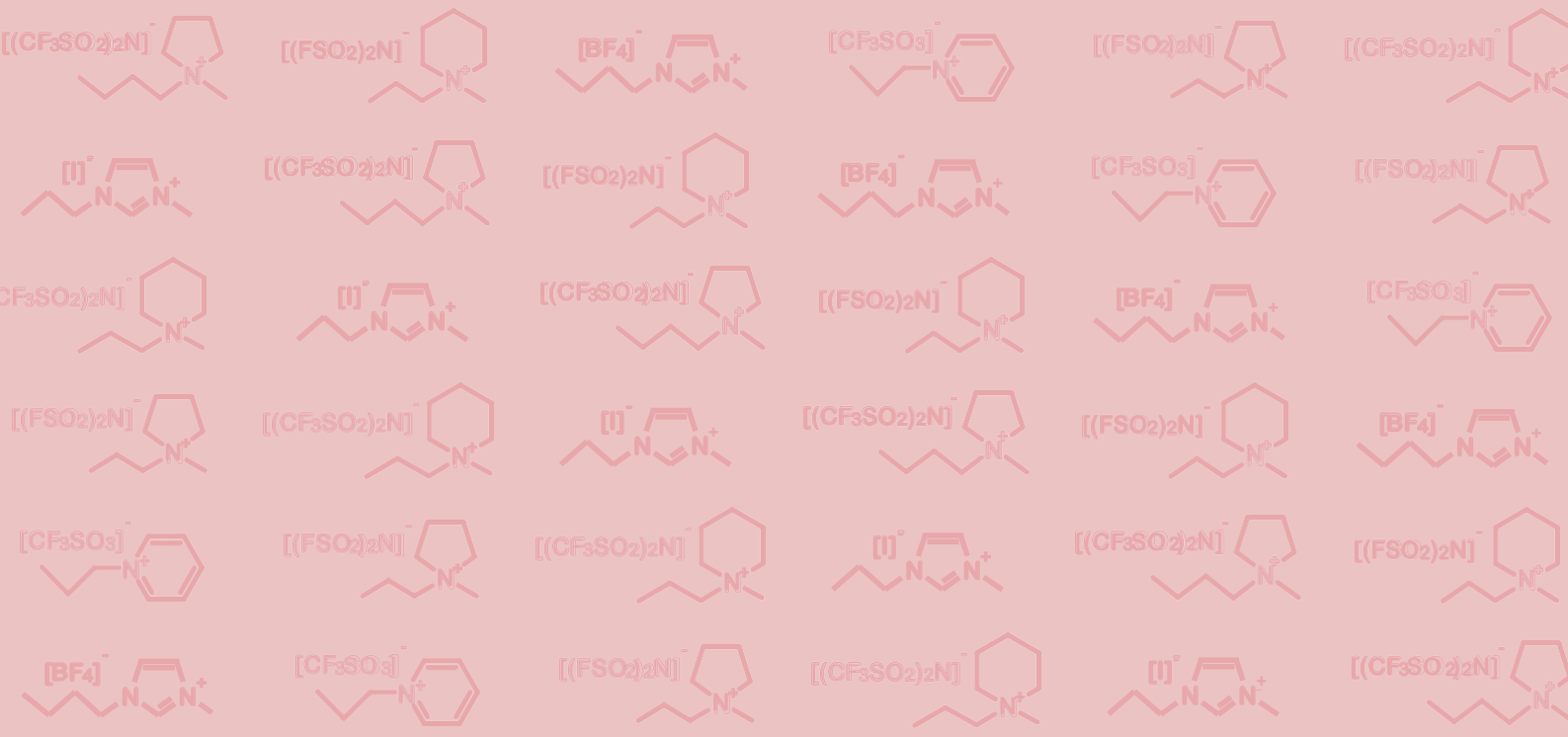
Materials science

6th Edition

Ionic Liquids General Catalog



Kanto Chemical Co., Inc.

For your safe

The use of reagents involves potential danger; fires, explosions, accidental ingestion, poisoning, irritation of mucous membranes due to inhalation of vapor, chemical or physical damage to the skin, etc. Furthermore, it is required to use reagents while considering the impact on the environment.
Although various regulations and hazard information are described as much as possible on catalogs or labels, there are many chemicals with little knowledge or information on hazard. We would like you to pay attention to the following, when handling reagents.

- When ordering, please use the product code and product name listed in the catalog for accuracy.
- Please refer to the description of label, SDS, related regulations and etc when use.
- Please manage properly in accordance with the laws and regulations, and take all possible measures to prevent reagents from tipping over and falling. Please take appropriate safety measures such as wearing protective equipment.
- Please store the remaining reagents properly and manage them thoroughly. Build a database to manage usage.
- Dispose of waste or remaining reagents appropriately accordance with corresponding regulations, referring to SDS.

Contents of the catalog

The prices, packaging or other properties of products listed in the catalog are subject to change due to fluctuations of circumstances, also specification, grades, etc. are subject to change. Please check the product search site "*Cica-Web*" for the information. The product may be deleted due to various reasons, but if possible, a replacement may be available. Please contact distributor.

Please be aware that some products require registration, permission for use, information necessary for stable supply and legally required procedures when ordered or received.

Ionic liquid is

Compounds consisting solely of ions (anions and cations) with a melting point below 100 °C. are called ionic liquids (Ionic Liquids). Ionic liquids are substances that combine features such as non-volatility, flame resistance, high ionic conductivity and excellent electrochemical properties. As a result, they are highly promising as materials in various fields, including energy, bio- and environment-related fields. Although not all ionic liquids have all the aforementioned characteristics, research and development by industry, academia and government is expanding from the acquisition of basic data to the study of practical applications, and developments that "can only be realised with ionic liquids" are being proposed.
We have about 50 ionic liquids in various combinations of anions and cations.

*Application example

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Guide

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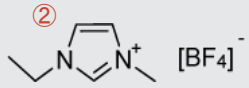
① 1-Ethyl-3-methylimidazolium tetrafluoroborate



② [BF_4]$^-$

③ 143314-16-3
④ $C_6H_{11}N_2BF_4$
⑤ 198.0

⑥ 15 ℃ ⑦ 34 cP (25 ℃) ⑧ d 1.28 (24 ℃) ⑨ 14.1 mS/cm (25 ℃)

⑩	⑫
14644-53	5 mL
14644-33	25 mL

① Name	② Structure	③ CAS RN®	④ Formula
⑤ Formula weight	⑥ Melting point	⑦ Viscosity	⑧ Density(Specific gravity)
⑨ Conductivity	⑩ Product No.	⑪ Grade	⑫ Package

Grade

The purity item is left blank, but each product has its own guaranteed items such as moisture value.
Please refer to the “Cica-Web” on our website. Regulations are also listed.

※Colour of products
We are trying to make our products as colourless and transparent as possible, but due to the current manufacturing process, there are products with a strong colour tone even in high-purity products. We ask for your understanding.

Physical property

The physical properties values vary from literature to literature due to the influence of small amounts of impurities resulting from differences in synthesis methods.
Some compounds in this catalogue have actual measured values specified, but these are basically based on literature values. We ask for your understanding that these are reference data.

- EMIm X (25 ℃)

Anion	Melting point (℃)	Density (g/cm^3)	Viscosity (mPa·s)	Conductivity (mS/cm)
BF_4^-	11[1],15[2]	1.24[1],1.28[2]	43[1],31.8[2]	13.0[1],13.6[2]
PF_6^-	62[1]	1.56[1]	-	5.2[1]
$CH_3SO_3^-$	39[3]	1.25[3]	160[3]	2.7[3]
$CF_3SO_3^-$	-10[3],-9[4]	1.383[3]	42.7[3]	9.29[3]
$[(CF_3SO_2)_2N]^-$	-15[1],-16[2]	1.52[1], ※,1.518[2]	28[1],40.7[2]	8.4[1],5.7[2]
$[(C_2F_5SO_2)_2N]^-$	-1[1],-19[5]	-	61[1]	3.4[1]

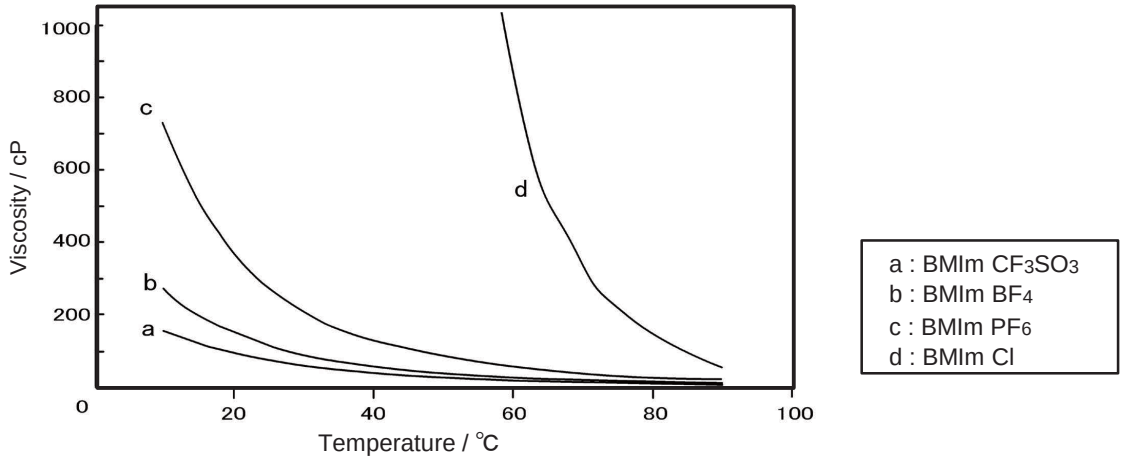
※ 22 ℃

1) A. A.B.McEwen, H.LNgo, K. LeCompte, and J.L.Goldman, *J.Electrochem. Soc.*, 146,1687 (1999)
2) A.Noda, K.Hayamizu, and M.Watanabe, *J.Phys, Chem.*, B, 105,4603 (2001)
3) E.I. Cooper and E.J.M. O' Sullivan, *Proc. Of 8th Int. Symp* ., 382 (1992)
4) P.BonHote, A.-P.Dias, M.Armand, N.Papageorgiou, K.kalyanasundaram, and M.Gratzle, *Inorg. Chem.*, 35, 1168 (1996)
5) M.Yosizawa, W.Ogihara, and H.Ohno, *Electrochem.Solid-State Lett.*, 4, E25 (2001)

Viscosity by temperature change

The relationship between temperature and viscosity is shown as follows for the typical ionic liquids, 1-Butyl-3-methylimidazolium triflate, 1-Butyl-3-methylimidazolium tetrafluoroborate, 1-Butyl-3-methylimidazolium hexafluorophosphate and 1-Butyl-3-methylimidazolium chloride.

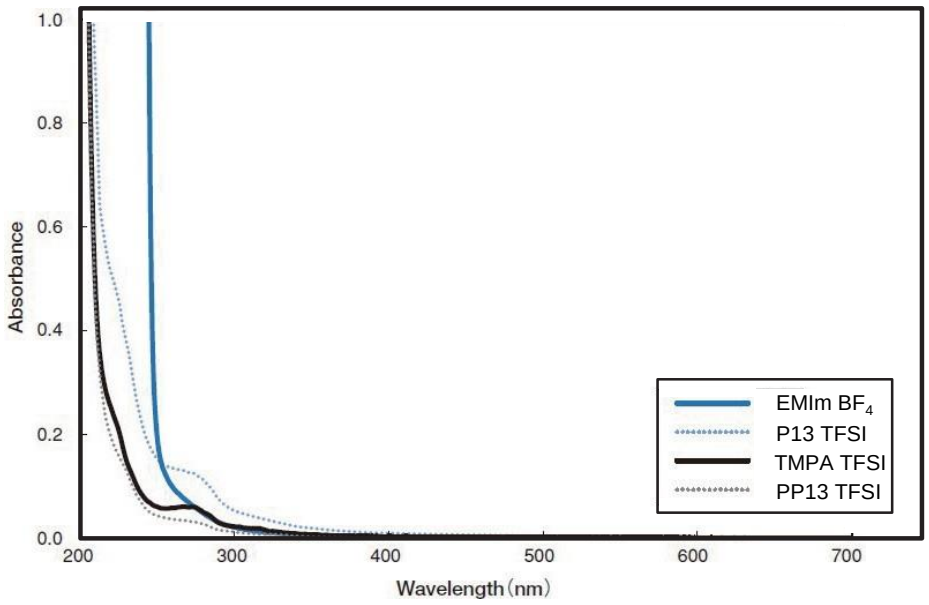
From the following figure, it can be seen that the viscosity changes significantly with slight changes in temperature and that differences in the constituent ions have a significant effect on the viscosity.



Viscosity by temperature change

Ultraviolet-visible absorption spectrum

Ultraviolet-visible absorption spectrum is shown as follows for the typical ionic liquids, 1-Ethyl-3-methylimidazolium tetrafluoroborate, *N*-Methyl-*N*-propylpyrrolidinium bis(trifluoromethanesulfonyl)imide, *N* ,*N* ,*N*-Trimethyl-*N*-propylammonium bis(trifluoromethanesulfonyl)imide, *N*-Methyl-*N*-propylpiperidinium bis(trifluoromethanesulfonyl)imide. EMIm BF_4 has a slight absorption, but little absorption is observed in the visible range (350-700 nm), making it colorless in appearance.



Ultraviolet-visible absorption spectrum

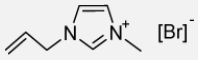
1-allyl-3-alkylimidazolium ionic liquids

Among the 1-allyl-3-alkylimidazolium ionic liquids developed by Prof. Ohno and his colleagues[6] at the Tokyo University of Agriculture and Technology, typical compounds have been commercialised. They are more polar than conventional ionic liquids and are expected to dissolve a wide range of compounds.

6) T. Mizuno, E. Marwanta, N. Matsumi, and H. Ohno, *Chem. Lett* .,. 33, 204, 1360.

Item List

1-Allyl-3-methylimidazolium bromide 【AMIm Br】

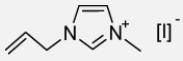


31410-07-8
$C_7H_{11}BrN_2$
203.1

01986-55	for advanced material research	5g
01986-35	for advanced material research	25g
01986-15	for advanced material research	250g

58℃ 1.60 mS/cm

1-Allyl-3-methylimidazolium iodide 【AMIm I】

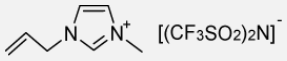


65039-07-8
$C_7H_{11}IN_2$
250.1

01120-35	for advanced material research	25g
01120-25	for advanced material research	100g

57℃

1-Allyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide 【AMIm TFSA】

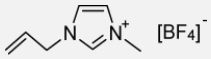


655249-87-9
$C_9H_{11}F_6N_3O_4S_2$
403.3

01988-55	for advanced material research	5mL
01988-35	for advanced material research	25mL
01988-15	for advanced material research	250mL

35 cP 1.49 8.87 mS/cm

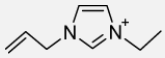
1-Allyl-3-methylimidazolium tetrafluoroborate 【AMIm BF4】



851606-63-8
$C_7H_{11}BF_4N_2$
210

01987-55	for advanced material research	5mL
01987-35	for advanced material research	25mL
01987-15	for advanced material research	250mL

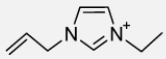
1-Allyl-3-ethylimidazolium bromide 【AEIm Br】



652134-09-3
$C_8H_{13}BrN_2$
217.1

01930-55	for advanced material research	5g
01930-35	for advanced material research	25g
01930-15	for advanced material research	250g

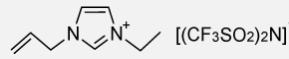
1-Allyl-3-ethylimidazolium iodide 【AEIm I】



920981-07-3
$C_8H_{13}IN_2$
264.1

01119-35	for advanced material research	25mL
01119-25	for advanced material research	100mL

1-Allyl-3-ethylimidazolium bis(trifluoromethanesulfonyl)imide 【AEIm TFSA】

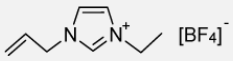


652134-11-7
$C_{10}H_{13}F_6N_3O_4S_2$
417.4

01932-55	for advanced material research	5mL
01932-35	for advanced material research	25mL
01932-15	for advanced material research	250mL

1-allyl-3-alkylimidazolium ionic liquids

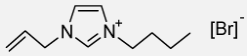
1-Allyl-3-ethylimidazolium tetrafluoroborate 【AEIm BF4】



945732-42-3
$C_8H_{13}BF_4N_2$
224

01931-55	for advanced material research	5mL
01931-35	for advanced material research	25mL
01931-15	for advanced material research	250mL

1-Allyl-3-butylimidazolium bromide 【ABIm Br】

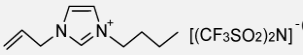


863498-30-0
$C_{10}H_{17}BrN_2$
245.2

01933-55	for advanced material research	5mL
01933-35	for advanced material research	25mL
01933-15	for advanced material research	250mL

0.50 mS/cm

1-Allyl-3-butylimidazolium bis(trifluoromethanesulfonyl)imide 【ABIm TFSA】

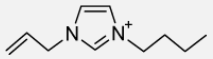


863498-34-4
$C_{12}H_{17}F_6N_3O_4S_2$
445.4

01935-55	for advanced material research	5mL
01935-35	for advanced material research	25mL
01935-15	for advanced material research	250mL

1.53 mS/cm

1-Allyl-3-butylimidazolium tetrafluoroborate 【ABIm BF4】

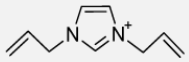


863498-32-2
$C_{10}H_{17}BF_4N_2$
252.1

01934-55	for advanced material research	5mL
01934-35	for advanced material research	25mL
01934-15	for advanced material research	250mL

1.22 mS/cm

1,3-Diallylimidazolium bromide 【AAIm Br】

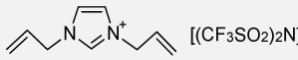


31483-71-3
$C_9H_{13}BrN_2$
229.1

11475-55	for advanced material research	5mL
11475-35	for advanced material research	25mL
11475-15	for advanced material research	250mL

0.74 mS/cm

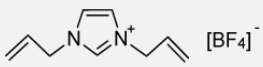
1,3-Diallylimidazolium bis(trifluoromethanesulfonyl)imide 【AAIm TFSA】



803732-17-4
$C_{11}H_{13}F_6N_3O_4S_2$
429.4

11477-55	for advanced material research	5mL
11477-35	for advanced material research	25mL
11477-15	for advanced material research	250mL

1,3-Diallylimidazolium tetrafluoroborate 【AAIm BF4】



852699-06-0
$C_9H_{13}BF_4N_2$
236

11476-55	for advanced material research	5mL
11476-35	for advanced material research	25mL
11476-15	for advanced material research	250mL

1-allyl-3-alkylimidazolium ionic liquids

Solubility

●Compatibility when mixed with various solvents (Volume ratio 1:1)

Solvent	AMIm Br	AMIm TFSI	AMIm BF_4	AEIm Br	AEIm TFSI	AEIm BF_4
Water	○	×	○	○	×	○
Methanol	○	○	○	○	○	○
Ethanol	○	○	×	○	○	△※2
2-propanol	○	○	×	○	○	×
Acetone	×	○	○	△	○	○
Ethyl acetate	×	○	△	×	○	△※3
Acetonitrile	○	○	○	○	○	○
Tetrahydrofuran	×	○	×	×	○	△※2
Diethyl ether	×	△	×	×	△※1	×
Hexane	×	×	×	×	×	×
Toluene	×	△	×	×	△※1	×
Dichloromethane	○	○	○	○	○	○
Chloroform	○	○	○	○	○	○

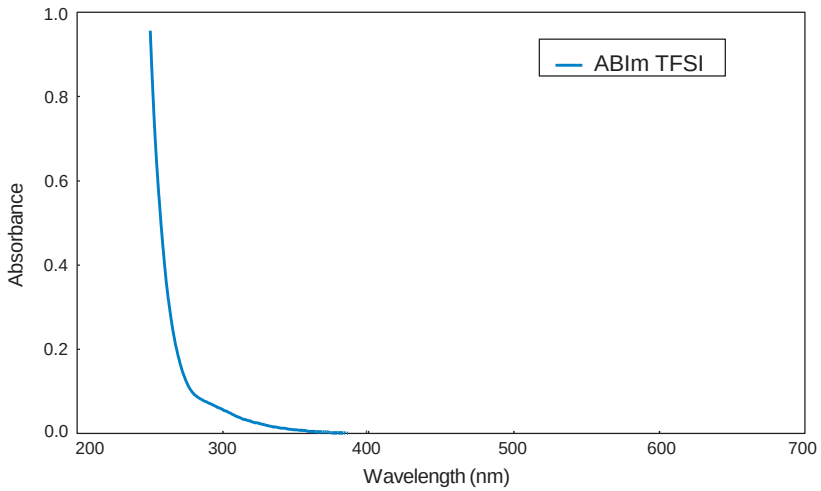
Solvent	ABIm Br	ABIm BF_4	ABIm TFSI	AAIm Br	AAIm BF_4	AAIm TFSI
Water	○	×	×	○	△※2	×
Methanol	○	○	○	○	○	○
Ethanol	○	○	○	○	△※5	○
2-propanol	○	○	○	○	△※3	○
Acetone	○	○	○	○	○	○
Ethyl acetate	×	○	○	×	△※6	○
Acetonitrile	○	○	○	○	○	○
Tetrahydrofuran	×	○	○	×	○	○
Diethyl ether	×	×	○	×	×	△※6
Hexane	×	×	×	×	×	×
Toluene	×	△※4	×	×	×	△※6
Dichloromethane	○	○	○	○	○	○
Chloroform	○	○	○	○	○	○

○ : Dissolve △ : Partly dissolved × : Insoluble

※ 1 : 80% dissolved ※ 4 : 40% dissolved
※ 2 : 50% dissolved※ 5 : 70% dissolved
※ 3 : 30% dissolved※ 6 : 90% dissolved

Ultraviolet-visible absorption spectrum

1-Allyl-3-butylimidazolium bis(trifluoromethanesulfonyl)imide (ABIm TFSI), a typical ionic liquid with allyl groups, is colourless in appearance and has little absorption observed in the visible range (350 ～ 700 nm).



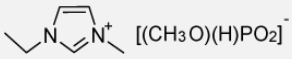
Cellulose soluble ionic liquid

We commercialize a phosphonate-based ionic liquid, which has been actively researched by Prof. Ohno of the Tokyo University of Agriculture and Technology.
This compound has a highly polar phosphoric acid derivative as an anion and can dissolve cellulose under mild conditions [7].

7) JY. Fukaya, K. Hayashi, M. Wada, and H. Ohno, *Green Chem*., 2008, 10, 44-46.

Item List

1-Ethyl-3-methylimidazolium methylphosphonate



$[(CH_3O)(H)PO_2]^-$

1137959-66-0
$C_7H_{15}N_2O_3P$
206.2

14670-35	for advanced material research	25 mL
14670-25	for advanced material research	100 mL

Solubility

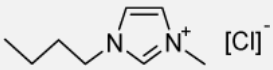
●Compatibility when mixed with various solvents (Volume ratio 1:1)

Solvent	1-Ethyl-3-methylimidazolium methylphosphonate
Water	○
Methanol	○
Ethanol	○
Acetone	○
Ethyl acetate	×
Acetonitrile	○
Tetrahydrofuran	△
Diethyl ether	×
Hexane	×
Toluene	×
Dichloromethane	○
Chloroform	○

○ : Dissolve △ : Partly dissolved × : Insoluble

Related item

1-Butyl-3-methylimidazolium chloride 【BMIm Cl】



$[Cl]^-$

79917-90-1
$C_8H_{15}ClN_2$
174.7

65℃

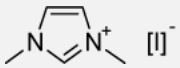
05068-53	for advanced material research	5 g
05068-33	for advanced material research	25 g

Iodine-based ionic liquids

Iodine-based ionic liquids have long been considered in fields such as dye-sensitized solar cells, but some products have been found to be colored due to iodine. This product is an ionic liquid with extremely low coloration.

Item List

1,3-Dimethylimidazolium iodide

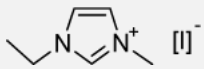


4333-62-4
$C_5H_9IN_2$
224

10506-35	for advanced material research 25 g
10506-25	for advanced material research 100 g

88℃

1-Ethyl-3-methylimidazolium iodide 【EMIm I】

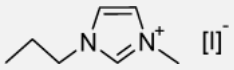


35935-34-3
$C_6H_{11}IN_2$
238.1

14669-35	for advanced material research 25 g
14669-25	for advanced material research 100 g

80-85℃

1-Methyl-3-propylimidazolium iodide

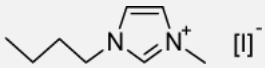


119171-18-5
$C_7H_{13}IN_2$
252.1

32520-35	for advanced material research 25 mL
32520-25	for advanced material research 100 mL

935 cP 1.54 0.96 mS/cm

1-Butyl-3-methylimidazolium iodide 【BMIm I】

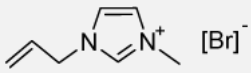


65039-05-6
$C_8H_{15}IN_2$
266.1

04235-35	for advanced material research 25 mL
04235-25	for advanced material research 100 mL

-72℃ 1183 cP 1.48 0.52 mS/cm

1-Hexyl-3-methylimidazolium iodide

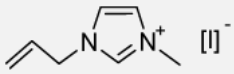


178631-05-5
$C_{10}H_{19}IN_2$
294.2

18010-35	for advanced material research 25 mL
18010-25	100 mL

1730 cP 0.25 mS/cm

1-Allyl-3-methylimidazolium iodide 【AMIm I】

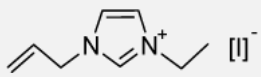


65039-07-8
$C_7H_{11}IN_2$
250.1

01120-35	for advanced material research 25g
01120-25	for advanced material research 100g

57℃

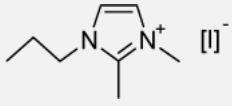
1-Allyl-3-ethylimidazolium iodide 【AEIm I】



920981-07-3
$C_8H_{13}IN_2$
264.1

01119-35	for advanced material research 25mL
01119-25	for advanced material research 100mL

1,2-Dimethyl-3-propylimidazolium iodide



218151-78-1
$C_8H_{15}IN_2$
266.1

11507-35	for advanced material research 25 g
11507-25	for advanced material research 100 g

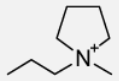
94℃

Pick up 1

Aliphatic ionic liquids developed by Mr. Matsumoto and his team at the National Institute of Advanced Industrial Science and Technology (AIST) have been commercialized.

Item List

1-Methyl-1-propylpyrrolidinium bis(trifluoromethanesulfonyl)imide 【P13 TFSA】



$[(CF_3SO_2)_2N]^-$

223437-05-6

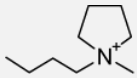
$C_{10}H_{18}F_6N_2O_4S_2$

408.4

26050-55	for advanced material research	5 mL
26050-35	for advanced material research	25 mL

59 cP　1.43　4.92 mS/cm

1-Butyl-1-methylpyrrolidinium bis(trifluoromethanesulfonyl)imide 【P14 TFSA】



$[(CF_3SO_2)_2N]^-$

223437-11-4

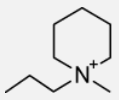
$C_{11}H_{20}F_6N_2O_4S_2$

422.4

26125-53	for advanced material research	5 mL
26125-33	for advanced material research	25 mL

-18℃　72 cP　1.4　2.12 mS/cm

1-Methyl-1-propylpiperidinium bis(trifluoromethanesulfonyl)imide 【PP13 TFSA】



$[(CF_3SO_2)_2N]^-$

608140-12-1

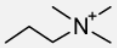
$C_{11}H_{20}F_6N_2O_4S_2$

422.4

26039-53	for advanced material research	5 mL
26039-33	for advanced material research	25 mL

176 cP　1.41　2.12 mS/cm

N,N,N-Trimethyl-N-propylammonium bis(trifluoromethanesulfonyl)imide 【TMPA TFSA】



$[(CF_3SO_2)_2N]^-$

268536-05-6

$C_8H_{16}F_6N_2O_4S_2$

382.3

41110-53	for advanced material research	5 mL
41110-33	for advanced material research	25 mL

Solubility and potential window

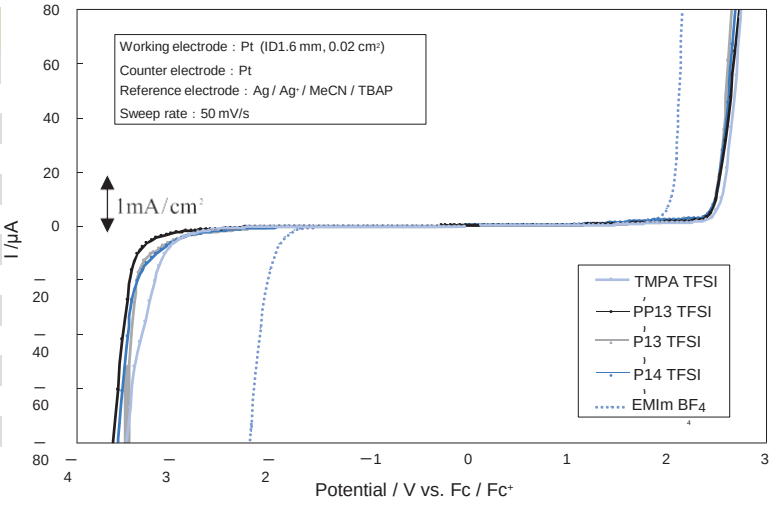
●Compatibility when mixed with various solvents (Volume ratio 1:1)

Solvent	P13 TFSI	P14 TFSI	PP13 TFSI	TMPA TFSI
Water	×	×	×	×
Methanol	○	○	○	○
Ethanol	○	○	○	○
2- propanol	○	○	○	○
Acetone	○	○	○	○
Ethyl acetate	○	○	○	○
Acetonitrile	○	○	○	○
Tetrahydrofuran	○	○	○	○
Diethyl Ether	△※1	△※4	×	△※1
Hexane	×	×	×	×
Toluene	△※3	△※3	△※3	△※2
Dichloromethane	○	○	○	○
Chloroform	○	○	○	○

○ : Dissolve
△ : Partly dissolved
× : Insoluble

※ 1 : 20% dissolved
※ 2 : 50% dissolved
※ 3 : 90% dissolved
※ 4 : 40% dissolved

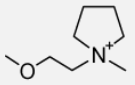
●Potential window for each ionic liquid



Pick up 2 ～ Nisshinbo Holdings Inc. ionic liquids

Item List

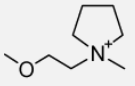
1-(2-Methoxyethyl)-1-methyl-pyrrolidinium bis(trifluoromethanesulfonyl)imide 【MEMP TFSA】



757240-24-7
$C_{10}H_{18}F_6N_2O_5S_2$
424.4

25966-55	for advanced material research	5mL
25966-35	for advanced material research	25mL
25966-05	for advanced material research	500g

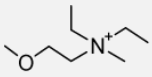
1-(2-Methoxyethyl)-1-methyl-pyrrolidinium tetrafluoroborate 【MEMP BF4】



464927-76-2
$C_8H_{18}BF_4NO$
231

25967-45	for advanced material research	10mL
25967-25	for advanced material research	100mL
25967-05	for advanced material research	500g

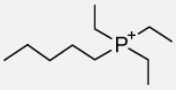
N,N-Diethyl-N-methyl-N-(2-methoxyethyl)ammonium bis(trifluoromethanesulfonyl)imide 【DEME TFSA】



464927-84-2
$C_{10}H_{20}F_6N_2O_5S_2$
426.4

11468-55	for advanced material research	5 mL
11468-35	for advanced material research	25 mL

N,N-Diethyl-N-methyl-N-(2-methoxyethyl)ammonium tetrafluoroborate 【DEME BF4】



464927-72-8
$C_8H_{20}NOBF_4$
233.1

11469-45	for advanced material research	10 mL
11469-25	for advanced material research	100 mL

1.24 mS/cm

Solubility

●Compatibility when mixed with various solvents (Volume ratio 1:1)

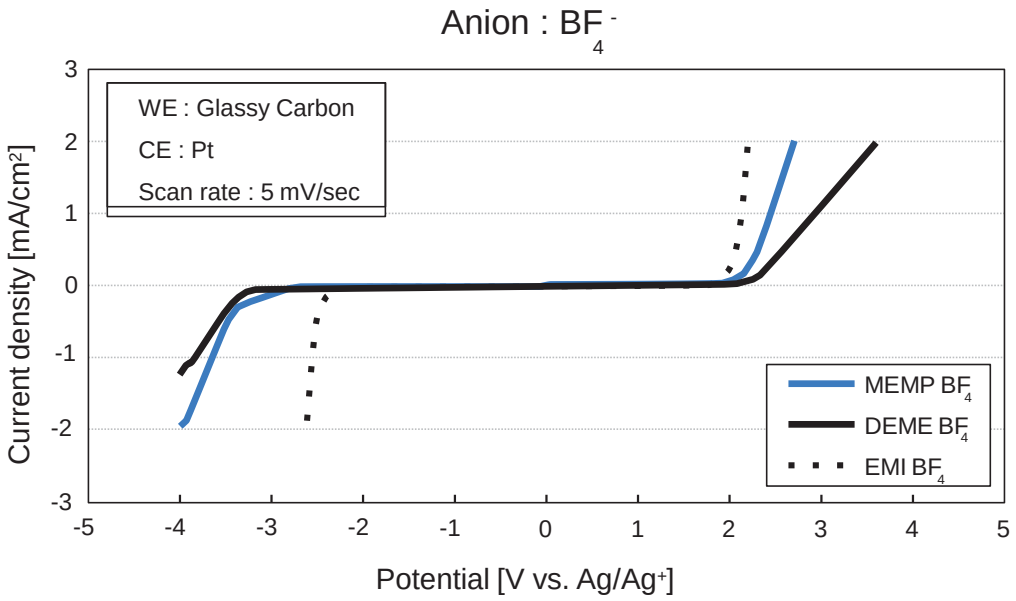
Solvent	MEMP TFSI	MEMP BF_4	DEME TFSI	DEME BF_4
Water	×	○	×	○
Methanol	○	○	○	○
Ethanol	○	△※1	○	△※3
2- propanol	○	△※2	△※2	△※4
Acetone	○	○	○	○
Ethyl acetate	○	△※1	○	×
Acetonitrile	○	○	○	○
Tetrahydrofuran	○	△※3	○	△※3
Hexane	×	×	×	×
Toluene	○	×	×	×
Chloroform	○	○	○	○

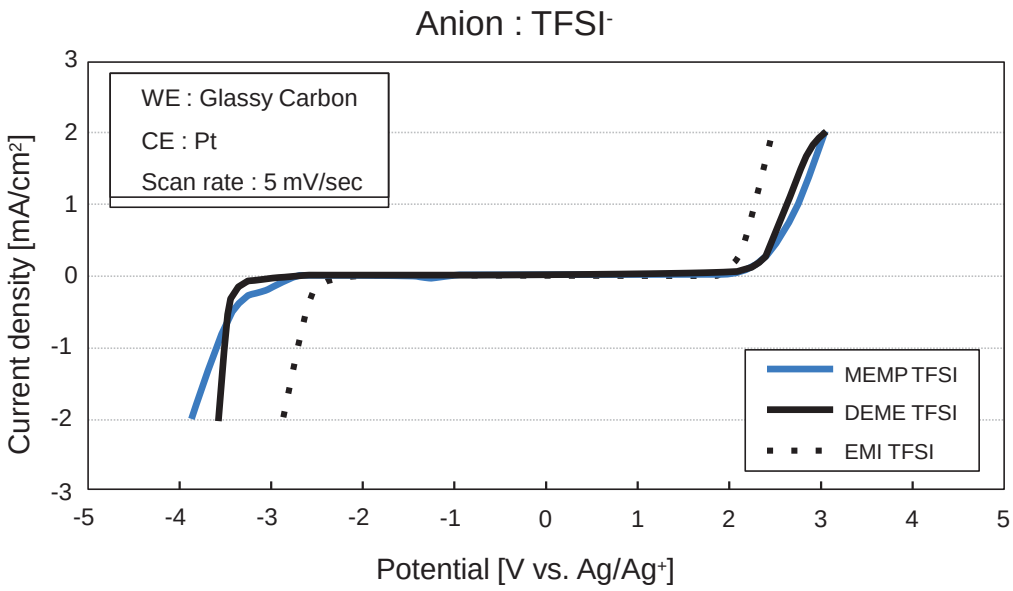
○ : Dissolve
△ : Partly dissolved
× : Insoluble

※ 1 : 30% dissolved
※ 2 : 10% dissolved
※ 3 : 20% dissolved
※ 4 : max. 10% dissolved

Pick up 2 ～ Nisshinbo Holdings Inc. ionic liquids

Potential window

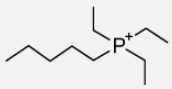




Pick up 3 ～ Nippon Chemical Industrial Quaternary Phosphonium ionic liquids

Item List

Triethylpentylphosphonium bis(trifluoromethanesulfonyl)imide 【P_{2225} TFSA】



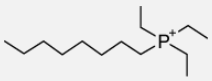
$[(CF_3SO_2)_2N]^-$

1010707-47-7
$C_{13}H_{26}F_6NO_4PS_2$
469.4

40334-35 for advanced material research 25 mL

17℃	88 cP	1.32	1.70 mS/cm

Triethyloctylphosphonium bis(trifluoromethanesulfonyl)imide 【P_{2228} TFSA】



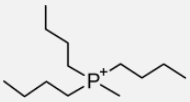
$[(CF_3SO_2)_2N]^-$

1002754-38-2
$C_{16}H_{32}F_6NO_4PS_2$
511.5

40335-35 for advanced material research 25 mL

< -50(Tg)	129 cP	1.26	0.98 mS/cm

Tributylmethylphosphonium bis(trifluoromethanesulfonyl)imide 【P_{4441} TFSA】



$[(CF_3SO_2)_2N]^-$

324575-10-2
$C_{15}H_{30}F_6NO_4PS_2$
497.5

40336-35 for advanced material research 25 mL

16℃	207 cP	1.28	0.42 mS/cm

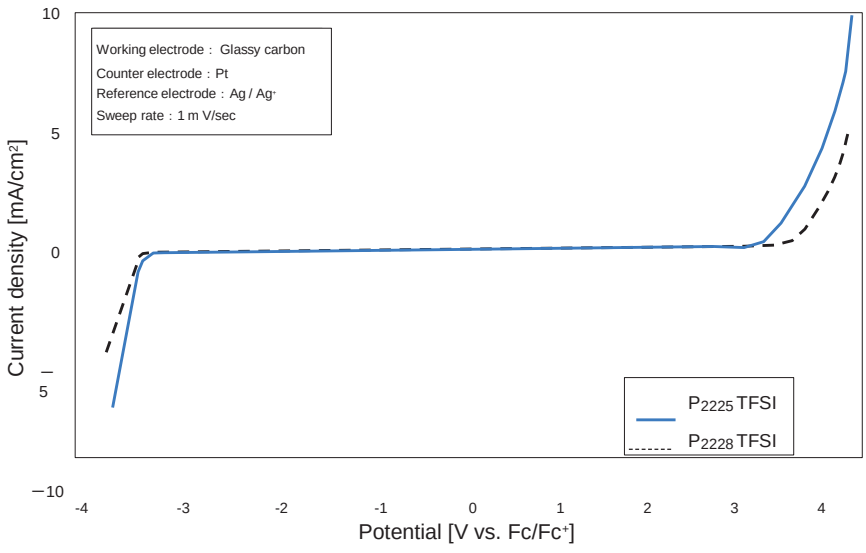
Solubility

●Compatibility when mixed with various solvents (Volume ratio 1:1)

Solvent	P_{2225} TFSI	P_{2228} TFSI	P_{4441} TFSI	$P_{222(1O1)}$ TFSI
Water	×	×	○	×
Methanol	○	○	○	○
Ethanol	○	○	○	○
Acetone	○	○	○	○
Acetonitrile	○	○	○	○
Hexane	×	×	×	×
Chloroform	○	○	○	○

○ : Dissolve , △ : Partly dissolved , × : Insoluble

Potential window

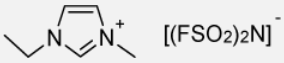


FSI (Bis fluorosulfonyl imide) ionic liquids

FSI-based ionic liquids are widely considered as electrolytes for rechargeable batteries due to their superiority over TFSI-based ionic liquids in terms of viscosity and ionic conductivity.

Item List

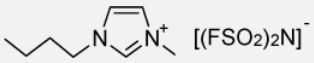
1-Ethyl-3-methylimidazolium bis (fluorosulfonyl)imide 【EMIm FSA】



235789-75-0
$C_6H_{11}F_2N_3O_4S_2$
291.3

-14℃	20 cP	1.45	14697-35	for advanced material research	25 mL

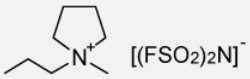
1-Butyl-3-methylimidazolium bis(fluorosulfonyl)imide 【BMIm FSA】



1235234-58-8
$C_8H_{15}F_2N_3O_4S_2$
319.4

	33 cP	1.36	05816-35	for advanced material research	25 mL

1-Methyl-1-propylpyrrolidinium bis(fluorosulfonyl)imide 【P13 FSA】



852620-97-4
$C_8H_{18}F_2N_2O_4S_2$
308.4

			25978-35	for advanced material research	25mL

Solubility

●Compatibility when mixed with various solvents (Volume ratio 1:1)

Solvent	EMIm FSI	BMIm FSI	P13 FSI
Water	×	×	×
Methanol	○	○	○
Ethanol	○	○	○
2- propanol	×	△※1	×
Acetone	○	○	○
Ethyl acetate	○	○	○
Acetonitrile	○	○	○
Tetrahydrofuran	○	○	○
Diethyl ether	×	×	×
Hexane	×	×	×
Toluene	×	○	×
Dichloromethane	○	○	○
Chloroform	○	○	○

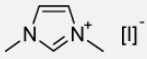
○ : Dissolve , △ : Partly dissolved , × : Insoluble

※1 : 10% dissolved

Imidazolium based ionic liquids

1-Alkyl-3-methylimidazolium

1,3-Dimethylimidazolium iodide

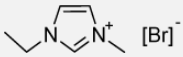


4333-62-4
$C_5H_9IN_2$
224

10506-35	for advanced material research	25 g
10506-25	for advanced material research	100 g

88℃

1-Ethyl-3-methylimidazolium bromide 【EMIm Br】

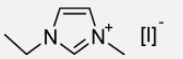


65039-08-9
$C_6H_{11}BrN_2$
191.1

14609-53	for advanced material research	5 g
14609-33	for advanced material research	25 g

74℃

1-Ethyl-3-methylimidazolium iodide 【EMIm I】

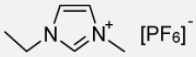


35935-34-3
$C_6H_{11}IN_2$
238.1

14669-35	for advanced material research	25 g
14669-25	for advanced material research	100 g

80-85℃

1-Ethyl-3-methylimidazolium hexafluorophosphate 【EMIm PF_6】

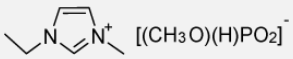


155371-19-0
$C_6H_{11}F_6N_2P$
256.1

14643-53	for advanced material research	5 g
14643-33	for advanced material research	25 g

62℃ 1.56

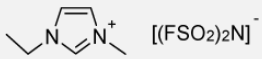
1-Ethyl-3-methylimidazolium methylphosphonate



1137959-66-0
$C_7H_{15}N_2O_3P$
206.2

14670-35	for advanced material research	25 mL
14670-25	for advanced material research	100 mL

1-Ethyl-3-methylimidazolium bis (fluorosulfonyl)imide 【EMIm FSA】

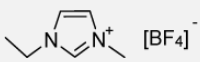


235789-75-0
$C_6H_{11}F_2N_3O_4S_2$
291.3

14697-35	for advanced material research	25 mL

-14℃ 20 cP 1.45

1-Ethyl-3-methylimidazolium tetrafluoroborate



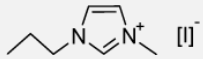
143314-16-3
$CH_3C_3H_3N_2C_2H_5BF_4$
198

14644-53	for advanced material research	5 mL
14644-33	for advanced material research	25 mL

15℃ 34 cP 1.28 14.1 mS/cm

Imidazolium based ionic liquids

1-Methyl-3-propylimidazolium iodide

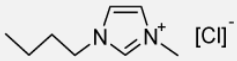


119171-18-5
$C_7H_{13}IN_2$
252.1

32520-35	for advanced material research	25 mL
32520-25	for advanced material research	100 mL

935 cP 1.54 0.96 mS/cm

1-Butyl-3-methylimidazolium chloride 【BMIm Cl】

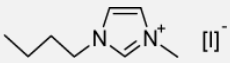


79917-90-1
$C_8H_{15}ClN_2$
174.7

05068-53	for advanced material research	5 g
05068-33	for advanced material research	25 g

65℃

1-Butyl-3-methylimidazolium iodide 【BMIm I】

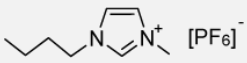


65039-05-6
$C_8H_{15}IN_2$
266.1

04235-35	for advanced material research	25 mL
04235-25	for advanced material research	100 mL

-72℃ 1183 cP 1.48 0.52 mS/cm

1-Butyl-3-methylimidazolium hexafluorophosphate 【BMIm PF_6】

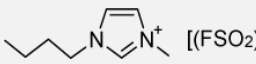


174501-64-5
$CH_3C_3H_3N_2C_4H_9PF_6$
284.2

05064-53	for advanced material research	5 mL
05064-33	for advanced material research	25 mL

-8℃ 267 cP 1.37 1.37 mS/cm

1-Butyl-3-methylimidazolium bis(fluorosulfonyl)imide 【BMIm FSA】

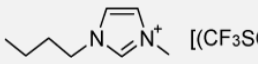


1235234-58-8
$C_8H_{15}F_2N_3O_4S_2$
319.4

05816-35	for advanced material research	25 mL

33 cP 1.36

1-Butyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide 【BMIm TFSA】

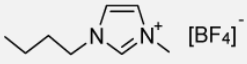


174899-83-3
$CH_3C_3H_3N_2C_4H_9[(CF_3SO_2)_2N]$
419.4

05063-53	for advanced material research	5 mL
05063-33	for advanced material research	25 mL

-4℃ 49 cP 1.44 3.41 mS/cm

1-Butyl-3-methylimidazolium tetrafluoroborate 【BMIm BF_4】



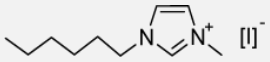
174501-65-6
$C_8H_{15}N_2BF_4$
226

05065-53	for advanced material research	5 mL
05065-33	for advanced material research	25 mL

-97(Tg) 104 cP 1.21 3.15 mS/cm

Imidazolium based ionic liquids

1-Hexyl-3-methylimidazolium iodide



178631-05-5

$C_{10}H_{19}IN_2$

294.2

[18010-35](#)	for advanced material research	25 mL	
[18010-25](#)		100 mL	

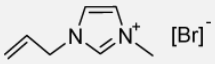
1730 cP

0.25 mS/cm

Imidazolium based ionic liquids

1−Alkyl−3−allylimidazolium

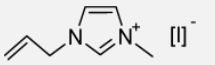
1-Allyl-3-methylimidazolium bromide 【AMIm Br】



31410-07-8	01986-55	for advanced material research	5g
$C_7H_{11}BrN_2$	01986-35	for advanced material research	25g
203.1	01986-15	for advanced material research	250g

58℃ 1.60 mS/cm

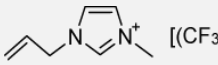
1-Allyl-3-methylimidazolium iodide 【AMIm I】



65039-07-8	01120-35	for advanced material research	25g
$C_7H_{11}IN_2$	01120-25	for advanced material research	100g
250.1			

57℃

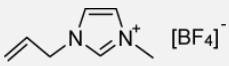
1-Allyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide 【AMIm TFSA】



655249-87-9	01988-55	for advanced material research	5mL
$C_9H_{11}F_6N_3O_4S_2$	01988-35	for advanced material research	25mL
403.3	01988-15	for advanced material research	250mL

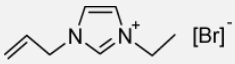
35 cP 1.49 8.87 mS/cm

1-Allyl-3-methylimidazolium tetrafluoroborate 【AMIm BF_4】



851606-63-8	01987-55	for advanced material research	5mL
$C_7H_{11}BF_4N_2$	01987-35	for advanced material research	25mL
210	01987-15	for advanced material research	250mL

1-Allyl-3-ethylimidazolium bromide 【AEIm Br】



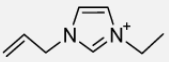
652134-09-3	01930-55	for advanced material research	5g
$C_8H_{13}BrN_2$	01930-35	for advanced material research	25g
217.1	01930-15	for advanced material research	250g

1-Allyl-3-ethylimidazolium iodide 【AEIm I】

920981-07-3	01119-35	for advanced material research	25mL
$C_8H_{13}IN_2$	01119-25	for advanced material research	100mL
264.1			

Imidazolium based ionic liquids

1-Allyl-3-ethylimidazolium bis(trifluoromethanesulfonyl)imide 【AEIm TFSA】

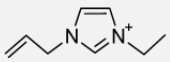


$[(CF_3SO_2)_2N]^-$

652134-11-7
$C_{10}H_{13}F_6N_3O_4S_2$
417.4

01932-55	for advanced material research	5mL
01932-35	for advanced material research	25mL
01932-15	for advanced material research	250mL

1-Allyl-3-ethylimidazolium tetrafluoroborate 【AEIm BF_4】

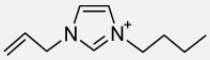


$[BF_4]^-$

945732-42-3
$C_8H_{13}BF_4N_2$
224

01931-55	for advanced material research	5mL
01931-35	for advanced material research	25mL
01931-15	for advanced material research	250mL

1-Allyl-3-butylimidazolium bromide 【ABIm Br】



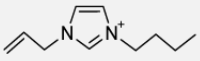
$[Br]^-$

863498-30-0
$C_{10}H_{17}BrN_2$
245.2

01933-55	for advanced material research	5mL
01933-35	for advanced material research	25mL
01933-15	for advanced material research	250mL

0.50 mS/cm

1-Allyl-3-butylimidazolium bis(trifluoromethanesulfonyl)imide 【ABIm TFSA】



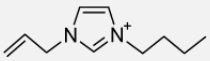
$[(CF_3SO_2)_2N]^-$

863498-34-4
$C_{12}H_{17}F_6N_3O_4S_2$
445.4

01935-55	for advanced material research	5mL
01935-35	for advanced material research	25mL
01935-15	for advanced material research	250mL

1.53 mS/cm

1-Allyl-3-butylimidazolium tetrafluoroborate 【ABIm BF_4】



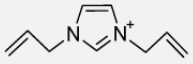
$[BF_4]^-$

863498-32-2
$C_{10}H_{17}BF_4N_2$
252.1

01934-55	for advanced material research	5mL
01934-35	for advanced material research	25mL
01934-15	for advanced material research	250mL

1.22 mS/cm

1,3-Diallylimidazolium bromide 【AAIm Br】



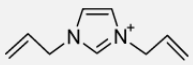
$[Br]^-$

31483-71-3
$C_9H_{13}BrN_2$
229.1

11475-55	for advanced material research	5mL
11475-35	for advanced material research	25mL
11475-15	for advanced material research	250mL

0.74 mS/cm

1,3-Diallylimidazolium bis(trifluoromethanesulfonyl)imide 【AAIm TFSA】



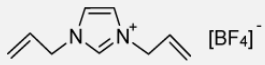
$[(CF_3SO_2)_2N]^-$

803732-17-4
$C_{11}H_{13}F_6N_3O_4S_2$
429.4

11477-55	for advanced material research	5mL
11477-35	for advanced material research	25mL
11477-15	for advanced material research	250mL

Imidazolium based ionic liquids

1,3-Diallylimidazolium tetrafluoroborate 【AAIm BF_4】



852699-06-0

$C_9H_{13}BF_4N_2$

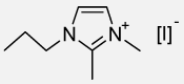
236

11476-55	for advanced material research	5mL
11476-35	for advanced material research	25mL
11476-15	for advanced material research	250mL

Imidazolium based ionic liquids

1,2,3-Alkylimidazolium

1,2-Dimethyl-3-propylimidazolium iodide



218151-78-1

$C_8H_{15}IN_2$

266.1

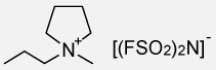
94℃

11507-35	for advanced material research	25 g
11507-25	for advanced material research	100 g

Pyrrolidinium based ionic liquids

1-Alkyl-1-methylpyrrolidinium

1-Methyl-1-propylpyrrolidinium bis(fluorosulfonyl)imide 【P13 FSA】

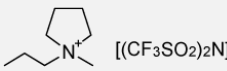


$[(FSO_2)_2N]^-$

852620-97-4
$C_8H_{18}F_2N_2O_4S_2$
308.4

25978-35	for advanced material research	25mL

1-Methyl-1-propylpyrrolidinium bis(trifluoromethanesulfonyl)imide 【P13 TFSA】



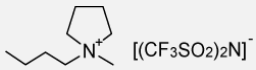
$[(CF_3SO_2)_2N]^-$

223437-05-6
$C_{10}H_{18}F_6N_2O_4S_2$
408.4

26050-55	for advanced material research	5 mL
26050-35	for advanced material research	25 mL

59 cP 1.43 4.92 mS/cm

1-Butyl-1-methylpyrrolidinium bis(trifluoromethanesulfonyl)imide 【P14 TFSA】



$[(CF_3SO_2)_2N]^-$

223437-11-4
$C_{11}H_{20}F_6N_2O_4S_2$
422.4

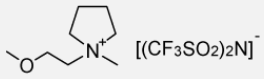
26125-53	for advanced material research	5 mL
26125-33	for advanced material research	25 mL

-18℃ 72 cP 1.4 2.12 mS/cm

Pyrrolidinium based ionic liquids

1-Methyl-1-(X)pyrrolidinium

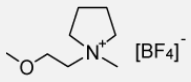
1-(2-Methoxyethyl)-1-methyl-pyrrolidinium bis(trifluoromethanesulfonyl)imide 【MEMP TFSA】



757240-24-7
$C_{10}H_{18}F_6N_2O_5S_2$
424.4

25966-55	for advanced material research	5mL
25966-35	for advanced material research	25mL
25966-05	for advanced material research	500g

1-(2-Methoxyethyl)-1-methyl-pyrrolidinium tetrafluoroborate 【MEMP BF_4】



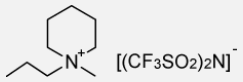
464927-76-2
$C_8H_{18}BF_4NO$
231

25967-45	for advanced material research	10mL
25967-25	for advanced material research	100mL
25967-05	for advanced material research	500g

Piperidinium based ionic liquids

1-Alkyl-1-methylpiperidinium

1-Methyl-1-propylpiperidinium bis(trifluoromethanesulfonyl)imide 【PP13 TFSA】



608140-12-1

$C_{11}H_{20}F_6N_2O_4S_2$

422.4

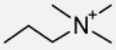
26039-53	for advanced material research	5 mL
26039-33	for advanced material research	25 mL

176 cP 1.41 2.12 mS/cm

Ammonium based ionic liquids

Alkylammoniu

N,N,N-Trimethyl-N-propylammonium bis(trifluoromethanesulfonyl)imide 【TMPA TFSA】



$[(CF_3SO_2)_2N]^-$

268536-05-6

$C_8H_{16}F_6N_2O_4S_2$

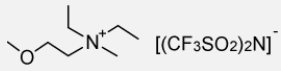
382.3

41110-53	for advanced material research	5 mL
41110-33	for advanced material research	25 mL

Ammonium based ionic liquids

Ammonium [Others]

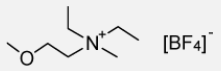
N,N-Diethyl-N-methyl-N-(2-methoxyethyl)ammonium bis(trifluoromethanesulfonyl)imide 【DEME TFSA】



464927-84-2
$C_{10}H_{20}F_6N_2O_5S_2$
426.4

11468-55	for advanced material research	5 mL
11468-35	for advanced material research	25 mL

N,N-Diethyl-N-methyl-N-(2-methoxyethyl)ammonium tetrafluoroborate 【DEME BF_4】



464927-72-8
$C_8H_{20}NOBF_4$
233.1

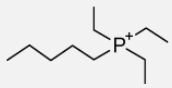
1.24 mS/cm

11469-45	for advanced material research	10 mL
11469-25	for advanced material research	100 mL

Phosphonium based ionic liquids

Alkylphosphonium

Triethylpentylphosphonium bis(trifluoromethanesulfonyl)imide 【P_{2225} TFSA】



$[(CF_3SO_2)_2N]^-$

1010707-47-7

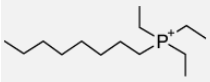
$C_{13}H_{26}F_6NO_4PS_2$

469.4

40334-35	for advanced material research	25 mL			

17℃	88 cP	1.32	1.70 mS/cm

Triethyloctylphosphonium bis(trifluoromethanesulfonyl)imide 【P_{2228} TFSA】



$[(CF_3SO_2)_2N]^-$

1002754-38-2

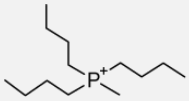
$C_{16}H_{32}F_6NO_4PS_2$

511.5

40335-35	for advanced material research	25 mL			

< -50(Tg)	129 cP	1.26	0.98 mS/cm

Tributylmethylphosphonium bis(trifluoromethanesulfonyl)imide 【P_{4441} TFSA】



$[(CF_3SO_2)_2N]^-$

324575-10-2

$C_{15}H_{30}F_6NO_4PS_2$

497.5

40336-35	for advanced material research	25 mL			

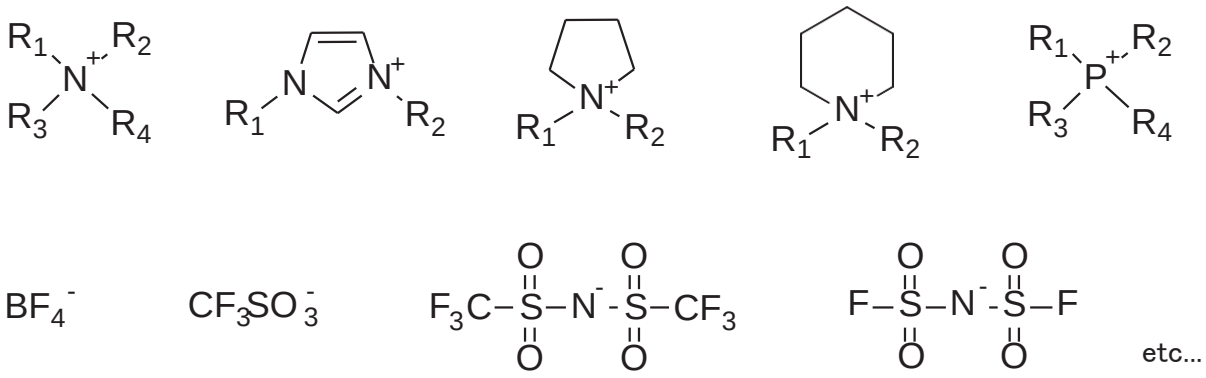
16℃	207 cP	1.28	0.42 mS/cm

Related products

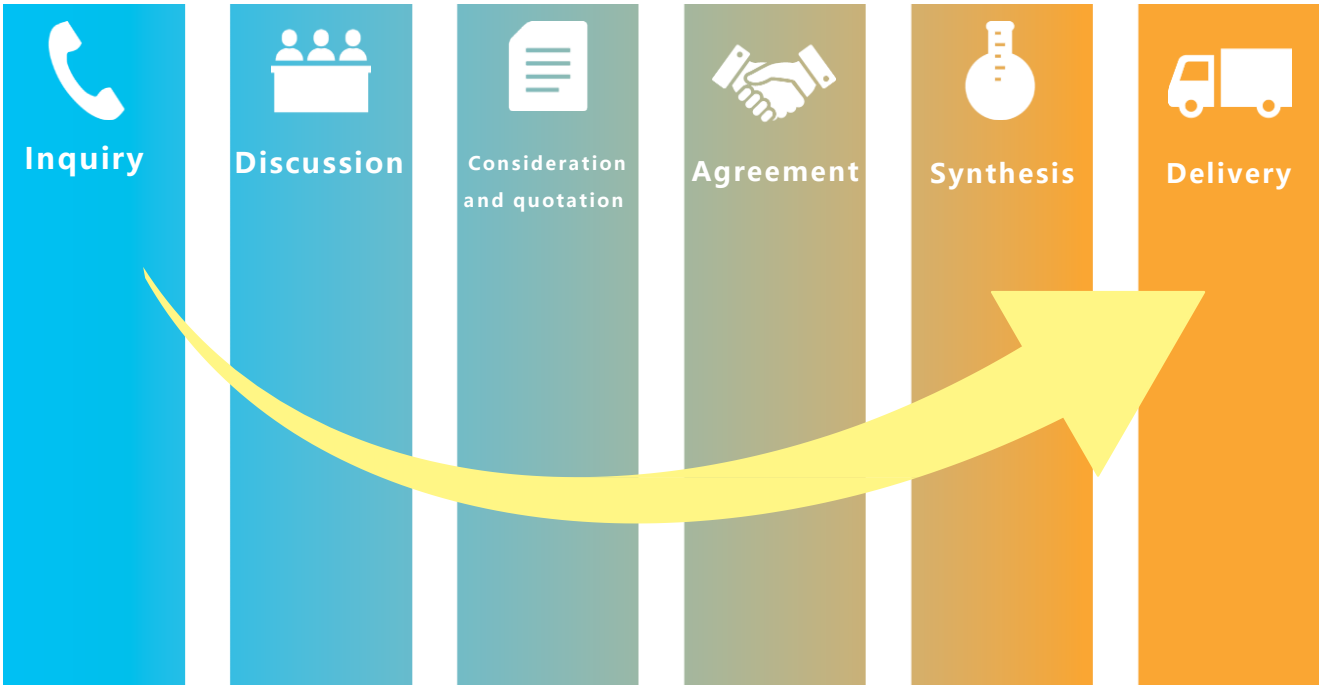
Name	CAS RN®	Formula weight	Product Code	Package
Lithium bis(fluorosulfonyl)imide	171611-11-3	187.1	24076-55	5 g
			24076-35	25 g
Lithium bis(trifluoromethanesulfonyl)imide	90076-65-6	287.1	24290-35	25 g
			24290-15	250 g
			24290-95	2 kg
Potassium bis(trifluoromethanesulfonyl)imide	90076-67-8	319.2	33005-35	25 g
			33005-15	250 g
			33005-95	2 kg
1,1,1-Trifluoro-*N*-[(trifluoromethyl)-sulfonyl]methanesulfonamide	82113-65-3	281.2	41075-35	25 g
			41075-15	250 g
			41075-95	2 kg
Lithium bis(nonafluorobutanesulfonyl)imide	119229-99-1	587.1	24039-65	1 g
			24039-55	5 g
Potassium bis(nonafluorobutanesulfonyl)imide	129135-87-1	619.3	33008-55	5 g
1,1,2,2,3,3,4,4,4-Nonafluoro-*N*-[(nonafluorobutyl)sulfonyl]-1-butanesulfonamide	39847-39-7	581.2	28395-65	1 g
			28395-55	5 g

Custom synthesis service

Ionic liquids are known to change their physico-chemical properties, such as viscosity, polarity, hydrophilicity and hydrophobicity, depending on the combination of their constituent cations and anions. For this reason, ionic liquids are being investigated for practical applications, such as electrolytes for next-generation secondary batteries, cellulose dissolvers, gas absorbers and lubricants, as liquids with distinctive functions. Our ionic liquids are characterised by their high quality with minimal impurities, and we have experience in the contract synthesis of a wide range of ionic liquids. Furthermore, we can supply ionic liquids on a variety of scales, from research to production applications. If you have a specific ionic liquid, grade or quantity you require, please contact us.



From Inquiry to Delivery



*If necessary, we will conclude a confidentiality agreement.
*In the event that synthesis is difficult, or it is predicted that the customer's request will not be met, we may decline the request.

- Please use the products listed in the catalog as reagents (chemicals used for testing or research purpose).
- Product information is subject to change without notice. For the latest information, please have a look at our website "Cica-Web".

KANTO CHEMICAL CO., INC.

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