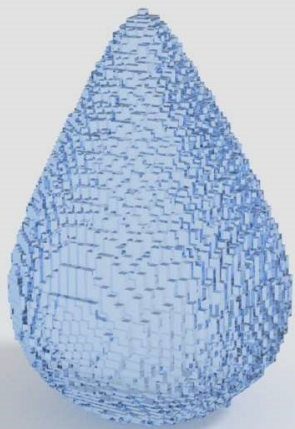




## Ionic Liquid Production & Development



## Ionic Liquids par excellence

### COMPANY OVERVIEW

Company name: proionic GmbH

Headquarter: Grambach, Austria

Founded: 2004

Leading manufacturer and supplier of ionic liquids

Serving the

electronic, textile, pulp & paper, automotive, metallurgical and any other industry

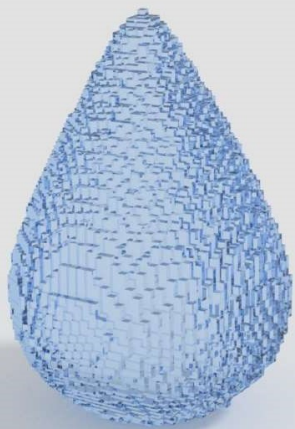
### SERVICE PORTFOLIO

- | Production of next generation purity ionic liquids
- | Research & development
- | Recycling of proionic's ionic liquid products

### COMPANY PROFILE

proionic, a pioneer in the field and a globally leading manufacturer and supplier of ionic liquids, offers innovative solutions for the efficient & competitive development & production of ionic liquids and corresponding applications.

Exclusive technologies and long-time experience are the basis for world's most innovative ionic liquid manufacturing technology. proionic stands out due to its exclusive **CBILS® production process**, a unique ionic liquid production technology for the efficient, safe, halide- and waste-free production of ultra-pure ionic liquids from kg- to ton scale.



## Ionic Liquids par excellence

### TECHNOLOGY - CBILS®

a unique ionic liquid production technology for  
halide- & waste-free, safe and economic production  
of ultra-pure ionic liquids

One of the most advanced commercialized methods for a greener industrial production of high-purity ionic liquids is our so-called **Carbonate Based Ionic Liquid Synthesis (CBILS®)**, a registered trademark of **proionic GmbH** process. This entirely halide- and waste-free production route, using carbonic acid esters as quaternization reagents, overcomes most of the drawbacks of conventional synthetic approaches and reduces the use of noxious chemicals to a minimum.

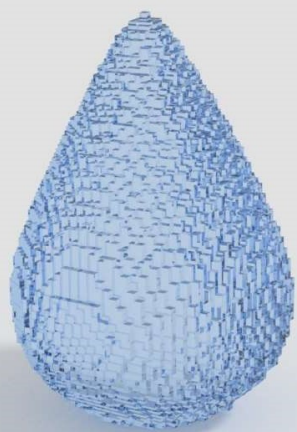
proionic's powerful CBILS® ionic liquid production process enables a theoretically unlimited combination of cations and anions. Choose either one of our EMIM-, BMIM-, or BMPyrr-based bestsellers or have your individual ionic liquid tailor-made by choosing cation and anion as desired.

#### TECHNOLOGY DEVELOPMENT with proionic

proionic enables the implementation of innovative technologies which emerge from the combination of ionic liquids, application expertise and technical realization. We offer our customers the opportunity to jointly develop completely new products and bring them to market, using proionic's ionic liquid and profound know-how.

### KEY BENEFITS

- | halide-free ionic liquid products (<5 ppm)
- | water levels in ionic liquids below 50 ppm realizable on large scale
- | high batch-to-batch stability
- | closed loops - no waste generated during synthesis/production (high atom economy)
- | clean-up of products not necessary, except for the distillation of solvent excess
- | the CBILS methylcarbonate intermediates are converted quantitatively with almost every Brønsted acid available to the final ionic liquid (modular system)
- | as an alternative to acids, ammonium salt can be used for the conversion of the methylcarbonate intermediates
- | easy scale-up to a multi ton level
- | batch and continuous-flow production processes available for various standard products
- | perfect ratio between cation and anion easily adjustable
- | high process safety



## Ionic Liquids par excellence

### STANDARD PRODUCTS

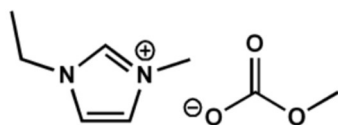
#### Intermediates

Product Name **1-Ethyl-3-methylimidazolium methylcarbonate solution,**  
approx. 30 %w in methanol

Synonyms EMIM MC, EMIM MeOCO<sub>2</sub>, EMIM methyl carbonate, C1C2Im MC, Im12 MC,

CAS-Number 251102-25-7

Formula



Molecular Weight 186.21 g/mol

Product Number 00199.5000

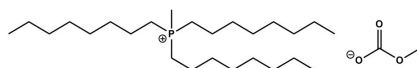
Applied in precursor for various ionic liquids

Product Name **Trioctylmethylphosphonium methylcarbonate solution,**  
**approx. 30%w in methanol**

Synonyms TOMP MC, TOMP MeOCO<sub>2</sub>, TOMP methyl carbonate,

CAS-Number 1204316-79-9

Formula



Molecular Weight 460.71 g/mol

Product Number 01299.5000

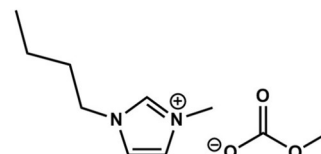
Applied in precursor for various ionic liquids

Product Name **1-Butyl-3-methylimidazolium methylcarbonate solution,**  
approx. 30 %w in methanol

Synonyms BMIM MC, BMIM MeOCO<sub>2</sub>, BMIM methyl carbonate, C1C4Im MC, Im14 MC,

CAS-Number 916850-37-8

Formula



Molecular Weight 214.27 g/mol

Product Number 00299.5000

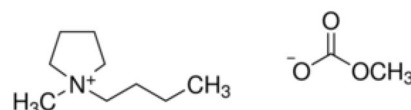
Applied in precursor for various ionic liquids

Product Name **1-Butyl-1-methylpyrrolidinium methylcarbonate solution,**  
**approx 50%w in methanol**

Synonyms BMPyrr MC, BMPyrr MeOCO<sub>2</sub>, BMPyrr methyl carbonate,

CAS-Number 1223496-96-5

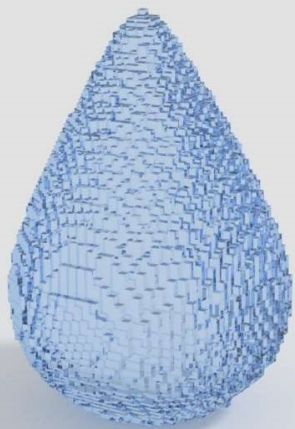
Formula



Molecular Weight 217.31 g/mol

Product Number 00399.5000

Applied in precursor for various ionic liquids



## Ionic Liquids par excellence

### STANDARD PRODUCTS

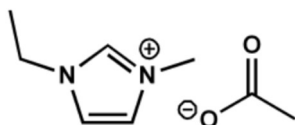
#### Ionic Liquids

Product Name **1-Ethyl-3-methylimidazolium acetate**

Synonyms EMIM OAc, EMIM Ac, C1C2Im OAc, Im12 OAc, EMIM acetate

CAS-Number 143314-17-4

Formula



Molecular Weight 170.21 g/mol

Available quality technical, purum.

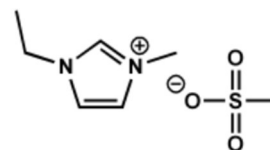
Applications biomass, textile, pulp & paper

Product Name **1-Ethyl-3-methylimidazolium methanesulfonate**

Synonyms EMIM MeSO3, EMIM mesylate, EMIM OM<sub>s</sub>, C1C2Im OM<sub>s</sub>, Im12 OM<sub>s</sub>

CAS-Number 145022-45-3

Formula



Molecular Weight 206.26 g/mol

Available quality technical, purum.

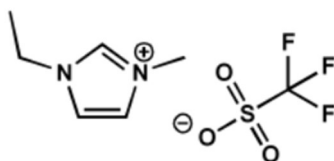
Applications air conditioning, air drying

Product Name **1-Ethyl-3-methylimidazolium trifluoromethanesulfonate**

Synonyms EMIM OTf, EMIM triflate, C1C2Im OTf, Im12 OTf, 1-ethyl-3-methylimidazolium triflate

CAS-Number 145022-44-2

Formula



Molecular Weight 264.26 g/mol

Available quality technical, purum.

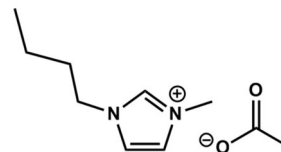
Applications lubrication, antistatic agent

Product Name **1-Butyl-3-methylimidazolium acetate**

Synonyms BMIM OAc, BMIM Ac, C1C4Im OAc, Im14 OAc, BMIM acetate

CAS-Number 284049-75-8

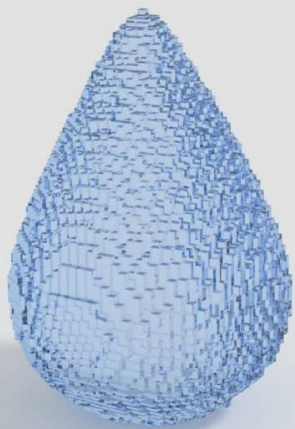
Formula



Molecular Weight 198.26 g/mol

Available quality technical, purum.

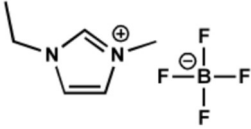
Applications biomass, textile, pulp & paper

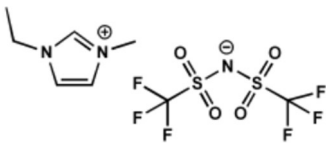


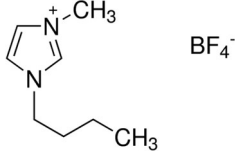
## Ionic Liquids par excellence

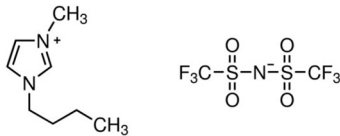
### STANDARD PRODUCTS

#### Ionic Liquids

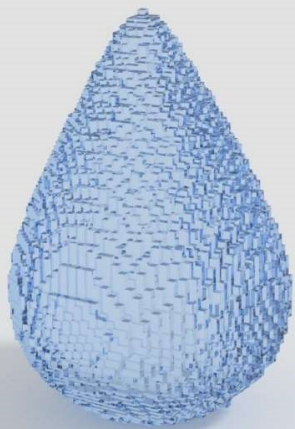
|                   |   |
|-------------------|---|
| Product Name      | <b>1-Ethyl-3-methylimidazolium<br/>tetrafluoroborate</b>  |
| Synonyms          | EMIM BF <sub>4</sub> , EMIM tetrafluoroborate,<br>C1C2Im BF <sub>4</sub> , Im12 BF <sub>4</sub> |
| CAS-Number        | 143314-16-3   |
| Formula           |              |
| Molecular Weight  | 197.97 g/mol  |
| Available quality | purum, puriss., electronic grade  |
| Applications      | electrolyte, antistatic agent   |

|                   |   |
|-------------------|---|
| Product Name      | <b>1-Ethyl-3-methylimidazolium<br/>bis(trifluoromethylsulfonyl)imide</b>            |
| Synonyms          | EMIM TFSI, EMIM NTf <sub>2</sub> , EMIM BTI, EMIM<br>BTA, C1C2Im TFSI, Im12 TFSI    |
| CAS-Number        | 174899-82-2   |
| Formula           |  |
| Molecular Weight  | 391.30 g/mol  |
| Available quality | purum, puriss., electronic grade  |
| Applications      | electrolytes, antistatic agent  |

|                   |   |
|-------------------|---|
| Product Name      | <b>1-Butyl-3-methylimidazolium<br/>tetrafluoroborate</b>  |
| Synonyms          | BMIM-BF <sub>4</sub> , BMIM tetrafluoroborate,<br>C1C4Im-BF <sub>4</sub> , Im14-BF <sub>4</sub> |
| CAS-Number        | 174501-65-6   |
| Formula           |            |
| Molecular Weight  | 226.02 g/mol  |
| Available quality | purum, puriss., electronic grade  |
| Applications      | electrolyte, antistatic agent   |

|                   |   |
|-------------------|---|
| Product Name      | <b>1-Butyl-3-methylimidazolium<br/>bis(trifluoromethylsulfonyl)imide</b>              |
| Synonyms          | BMIM-TFSI, BMIM NTf <sub>2</sub> , BMIM-BTI, BMIM-<br>BTA, C1C4Im-TFSI, Im14-TFSI     |
| CAS-Number        | 174899-83-3   |
| Formula           |  |
| Molecular Weight  | 419.36 g/mol  |
| Available quality | purum, puriss., electronic grade  |
| Applications      | electrolytes, antistatic agent  |



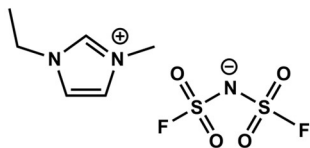


## Ionic Liquids par excellence

### STANDARD PRODUCTS

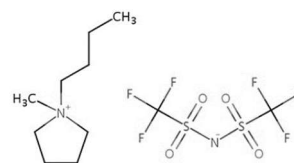
#### Ionic Liquids

|              |   |
|--------------|---|
| Product Name | <b>1-Ethyl-3-methylimidazolium<br/>bis(fluorosulfonyl)imide</b> |
| Synonyms     | EMIM FSI, C1C2Im FSI, Im12 FSI                                  |
| CAS-Number   | 235789-75-0   |
| Formula      |   |



|                   |                                  |
|-------------------|----------------------------------|
| Molecular Weight  | 291.29 g/mol                     |
| Available quality | purum, puriss., electronic grade |
| Applications      | electrolyte, antistatic agent    |

|              |  |
|--------------|--|
| Product Name | <b>1-Butyl-1-methylpyrrolidinium<br/>bis(trifluoromethylsulfonyl)imide</b>   |
| Synonyms     | BMPyrr BTA, BMPyrr NTf2, BMPyrr TFSI,<br>BMPyrr BTI, BMPyrr TFSI, Pyr14TFSI, |
| CAS-Number   | 223437-11-4  |
| Formula      |  |



|                   |                                  |
|-------------------|----------------------------------|
| Molecular Weight  | 422.4 g/mol                      |
| Available quality | purum, puriss., electronic grade |
| Applications      | electrolytes, antistatic agent   |

### CONTACT & REQUEST



**Markus Damm**  
Head of R&D  
[markus.damm@proionic.com](mailto:markus.damm@proionic.com)  
T: +43 (664) 889 339 43

**Bernhard Ludwig**  
Head of Operations & Sales  
[bernhard.ludwig@proionic.com](mailto:bernhard.ludwig@proionic.com)  
T: +43 (664) 889 339 40

