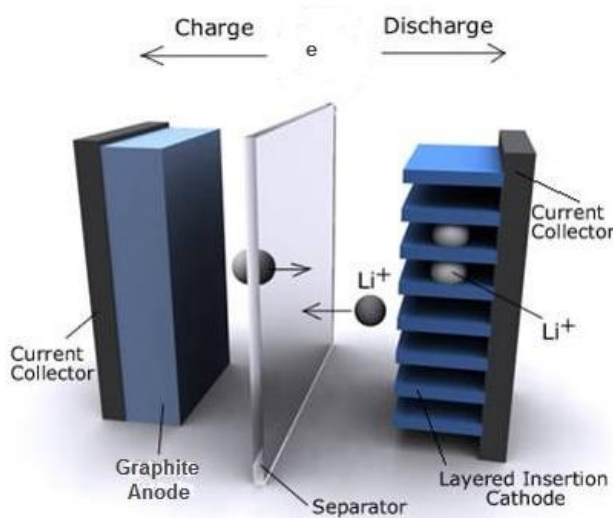


## LITHIUM-ION-BATTERIES

The replacement of conventional, flammable and volatile, solvent based electrolytes with ionic liquid based electrolytes provides lithium batteries with the level of safety that is required for their large-scale application.



Solvionic develops and produces electrolytes of high quality intended for use in Li-ion batteries.

**Quality:** Electrochemistry Grade 99.9% - H<sub>2</sub>O < 20ppm - Halide < 1ppm – Amine compounds < 10ppm.

**Packaging:** Our products are packaged in aluminum containers filled with argon gas (H<sub>2</sub>O < 0.5ppm, O<sub>2</sub> < 0.5ppm). Several volumes are available: 50g, 250g, 500g, and 1kg.

**Custom Formulations:** According to their specific needs, Solvionic provides its customers with ionic liquids based electrolytes, conventional electrolytes or mixtures of both, including additives.

### Ionic liquids

REFERENCES	IONIC LIQUIDS	CONDUCTIVITY / (mS.cm <sup>-1</sup> ) at RT	ELECTROCHEMICAL WINDOW / (V) at RT
IM0233A	1-Ethyl-3-methylimidazolium bis(fluorosulfonyl)imide – 99.9%	15.4	4.3
IM0208A	1-Ethyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide - 99.9%	9.0	4.5
PYR1333A	N-Propyl-N-methylpyrrolidinium bis(fluorosulfonyl)imide – 99.9%	9.1	5.4
PYR1308A	N-Propyl-N-methylpyrrolidinium bis(trifluoromethanesulfonyl)imide -99.9%	4.0	5.9
PI0333A	N-Propyl-N-methylpiperidinium bis(fluorosulfonyl)imide – 99.9%	4.3	5.7
PI0308A	N-Propyl-N-methylpiperidinium bis(fluoromethanesulfonyl)imide -99.9%	1.4	5.9

## Electrolytes based on Ionic Liquids + Lithium Salt

REFERENCES	FORMULATION
E010	1M LiTFSI in N-Methyl-N-Propylpyrrolidinium bis(fluorosulfonyl)imide <sup>1</sup>
E011	1M LiTFSI in 1-Ethyl-3-Methylimidazolium bis(fluoromethanesulfonyl)imide <sup>2</sup>
E---	-----Custom Formulations-----

## Non flammable Electrolytes (Ionic Liquids + Conventional Electrolytes)

Non flammable, safe and powerful electrolytes for Li-ion batteries are obtained by adding ionic liquids (30-70%) into conventional electrolytes.

REFERENCES	FORMULATION
E014	1-Ethyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide 30-40% wt. in 1M LiPF <sub>6</sub> EC:DEC (1:1 vol.%) <sup>3</sup> <i>H<sub>2</sub>O&lt;20ppm – packed under argon</i>
E015	1-Ethyl-3-methylimidazolium bis(fluorosulfonyl)imide 30-40% wt. in 1M LiPF <sub>6</sub> EC:DEC (1:1 vol.%) <i>H<sub>2</sub>O&lt;20ppm – packed under argon</i>
E---	-----Custom Formulations-----

## Conventional Electrolytes

Conventional electrolytes are produced in Solvionic and added to our ionic liquids to obtain non flammable electrolytes. These electrolytes are available for customers who wish to use them as such, or to experiment their own formulations.

REFERENCES	FORMULATION
E001	1M LiPF <sub>6</sub> in EC:DMC (1:1 vol.%) – 99.9% <i>H<sub>2</sub>O&lt;20ppm – packed under argon</i>
E003	1M LiPF <sub>6</sub> in 1 EC:DMC (1:1 vol.%) with 2%wt. VC – 99.9% <i>H<sub>2</sub>O&lt;20ppm – packed under argon</i>
E013	1M LiPF <sub>6</sub> in PC – 99.9% <i>H<sub>2</sub>O&lt;20ppm – packed under argon</i>
E008	1M LiPF <sub>6</sub> in PC with 2%wt. VC – 99.9% <i>H<sub>2</sub>O&lt;20ppm – packed under argon</i>
E---	-----Custom Formulations-----

\*EC: Ethylene carbonate, DMC: Dimethyl carbonate, PC: Propylene carbonate, VC: Vinylene carbonate, DEC: Diethyl carbonate

For more information please contact us: [Sales@solvionic.com](mailto:Sales@solvionic.com)

<sup>1</sup>B. Garcia et al. , Electrochimica Acta 49 (2004) 4583-4588

<sup>2</sup>H. Matsumoto et al., Journal of Power Sources 160 (2006) 1308-1313

<sup>3</sup>A. Guerfi et al., Journal of Power Sources, 195 (2010) 845-85