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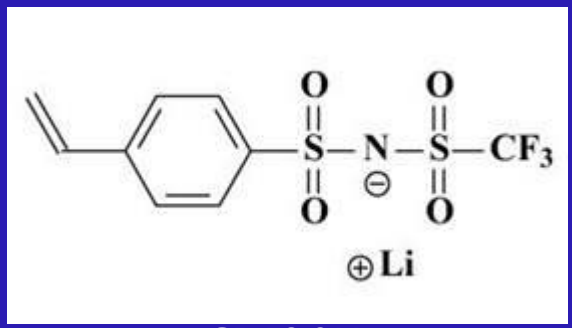
Solid Polymer Electrolytes
Monomers for Li-ion batteries

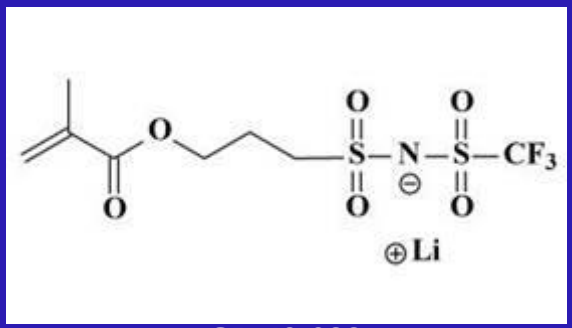
Energy storage is one of the biggest technological challenge of 21st century and Lithium-ion batteries appears as one of the most promising technologies in this area. Even if great performances were obtained with conventional Li-ion batteries based on liquid electrolytes, their uses in applications like electric vehicles or large-scale energy storage are limited mainly because of the instability of the liquid electrolytes leading to safety issues and difficulties linked to practical use.

In this area, **Solid Polymer Electrolytes (SPE)** appear as relevant alternative to conventional liquid electrolytes. Indeed, usually represented by a lithium salt associated with a polar neutral polymer or with an ion-conducting polymer matrix, SPE have been extensively studied due to their **nonvolatility and low flammability and represent a safer alternative to conventional liquid electrolytes**.

Monomers for Li-ion batteries



SP-59-011
STFSILi



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Nevertheless, the power delivery of these materials is limited by the concentration gradient of the lithium salt resulting in low lithium transference number. Indeed, traditional SPEs are dual-ion conductors, *i.e.* both cations and anions are mobile in the polymer electrolyte phase. The mobility of both ions induce a concentration polarization and finally end up with low reduced performances. One solution, called **Single lithium-ion conducting polymer electrolyte**, **consists in immobilizing the lithium counter ion to the polymeric material.**

In this area, SPECIFIC POLYMERS synthesize and sell (meth)acrylate and styrenic monomers bearing Lithium (trifluoromethylsulfonyl)imide (TFSILi) functional moieties.

SPECIFIC POLYMERS can provide sample from 10g to 50g for both monomers

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In the TFSILi functional moieties, the **Li+ cation is highly dissociated from this super-delocalized TFSI anion** when mixed in a polymeric media. Corresponding conductivities are further improved compared to more traditional Li+-Anion couples.

Related Articles

H. Zhang, M. Armand et al., *Single lithium-ion conducting solid polymer electrolytes: advances and perspectives*, Chem. Soc. Rev., **2017**, 46, 797.

L. Porcarelli, C. Gerbaldi et al., *Single-Ion Conducting Polymer Electrolytes for Lithium Metal Polymer Batteries that Operate at Ambient Temperature*, ACS Energy Lett. **2016**, 1, 678−682.

L. Porcarelli, C. Gerbaldi et al., *Single-Ion Block Copoly(ionic liquid)s as Electrolytes for All-Solid State Lithium Batteries*, ACS Appl. Mater. Interfaces, **2016**, 8, 10350−10359.

SP CATALOG

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