

Ionic Liquids based on Crown Ethers as electrolytes additives for batteries

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Room temperature ionic liquids (RTILs) are salts that are liquid at room temperature and that are usually composed of an asymmetrical organic cation and a large charge-delocalized anion which is poorly coordinated. They are non-flammable, and thermally as well as electrochemically stable. These properties make them very interesting for many applications including green solvents for synthesis, catalysis, and electrolytes for ionic and electronic devices

Crown ethers are able to strongly interact with alkali metal cations (Li^+ , Na^+ , K^+) and have been used as additives in battery electrolytes in order to increase the ionic conductivity of the latter and to prevent electrolyte decomposition²⁻³. However, few studies have been done on crown ethers in the field of electrolytes.

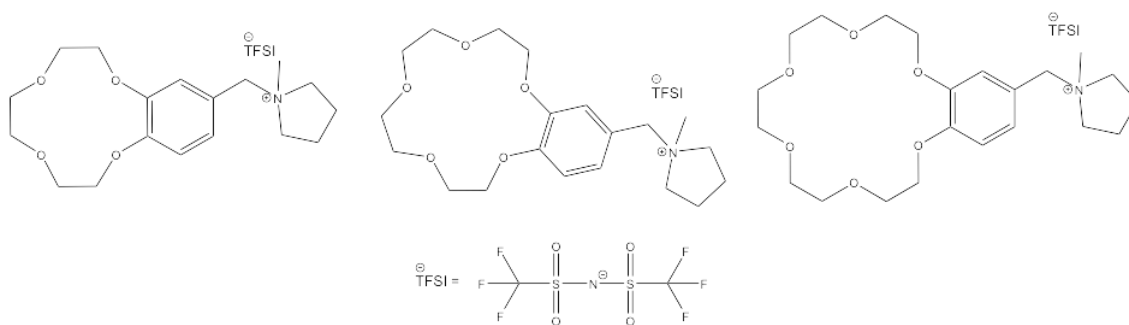


Figure 1: New Ionic liquids based on crown ether building blocks

This is why we propose to integrate them covalently as an alkali cation carrier⁴⁻⁵ in the ionic liquid system. The aim of the project is thus to design and synthesize new Room Temperature Ionic Liquids (RTILs) based on crown ether moieties, to investigate their properties (flammability, thermal and electrochemical stability, conductivity, Li/Na-ion diffusion) and then to use them as electrolytes for rechargeable batteries. We will present their synthesis, structures and properties in this contribution.

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