

**Redox Shuttles for Lithium Ion Batteries**

1. Provides a long term intrinsic overcharge protection of lithium-ion batteries.
2. Maintains the safe operation of lithium-ion batteries.
3. Highly-soluble in conventional non-aqueous, carbonate based electrolytes.
4. Increases battery long-term stability and oxidation potential.

**Electrochemical Properties:**

1. ANL-RS6 (10 mM) exhibits a reversible redox potential of about 4.8V vs Li/Li<sup>+</sup> (1.2 M LiPF<sub>6</sub> in 3:7 wt/wt mixtures of ethylene carbonate and ethyl methyl carbonate).[1]
2. In cell tests using LiMn<sub>2</sub>O<sub>4</sub> and Li<sub>1.2</sub>Ni<sub>0.15</sub>Co<sub>0.1</sub>Mn<sub>0.55</sub>O<sub>2</sub> as the cathode materials, overcharge protection was provided at 4.75 V vs. Li/Li<sup>+</sup>. [1]

**References:**

1. *Energy Environ. Sci.*, **2011**, *4*, 2858.