Non-Aqueous Electrolyte Solutions and Lithium/Oxygen Batteries Using the Same

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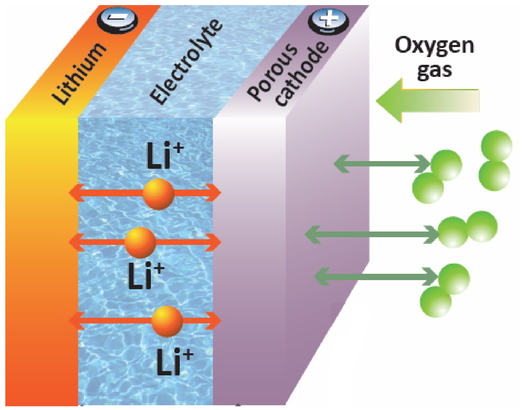
Technology Overview

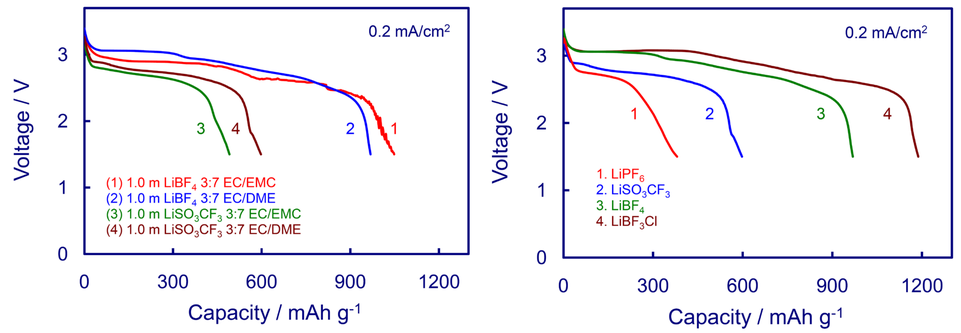
This is a non-aqueous electrolyte composition that makes Li-air cells outperform others using conventional electrolytes

- Costs less than or comparable with current electrolyte solutions
- The electrolyte solutions are is simple to practice and adaptable for mass production



Conceptual representation of lithium-air cell

Li-air Cell with Improved Electrolyte



Proof of Concept

- Tested electrolyte solutions in coin-size Li-air cells
- Assembly of Li-air cells has been reduced to practice - In dry room, calculated amount of lithium salt is dissolved into a non-aqueous solvent mixture; filling the resultant electrolyte solution into a Li-air cell stack yields a Li-air cell
- Currently TRL-6 level - Fully functioning manufacturing prototype cells have been constructed.

Technology Advantages

The electrolyte solutions offer higher discharge voltage, for example, at least 200 mV higher at 0.2 mA/c m^2 for a single Li-air cell

- The electrolyte solutions offer higher discharge capacity
- Lithium salts with lower cost are available among the salt family, for example, $LiBF_3Cl$ is cheaper than $LiBF_4$

Does not add extra procedures for the preparation of electrolyte solution when compared to standard formulations

Technology Differentiation

Significantly increase energy density of Li-air batteries by raising discharge voltage and increasing discharge specific capacity

A soldier currently requires carrying about 50 lbs of batteries. The invention reduces the overall weight and volume of the battery by 50%, allowing the soldier to carry other essential equipment.

Technology Agreements

Patent License Agreements (PLAs) and Cooperative Research and Development Agreements (CRADAs) are sought

A collaboration between the inventor team and the commercialization partner can speed development to market a CRADA

This technology is currently a TRL of 6, and a provisional patent application has been filed.

Technology Applications

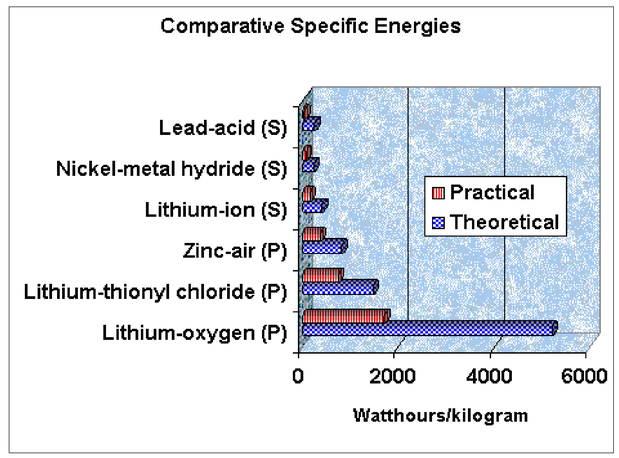
The tremendous **specific power potential** of Li/Air creates an assortment of potential uses:

Commercial

- A wide range of applications that require long-term continuous operations, such as radio and forecast stations
- Electronic equipment used in spacecrafts

Military

- Power source for remote field charging of military equipment
- Military electronics



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