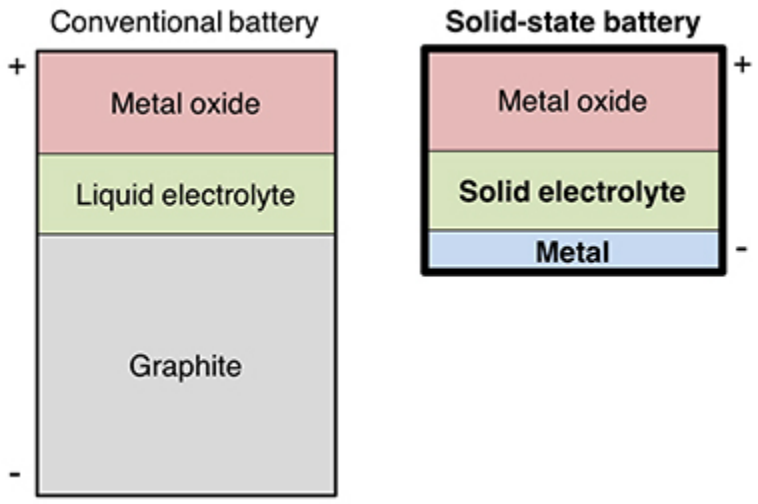
Docket #: S15-203

Highly Conducting Solid Electrolytes for Batteries

Engineers at the Cui Research group have recently patented a low-cost, high-performance solid electrolyte for solid-state lithium-ion batteries.

Hexacyanometallate electrolytes can eliminate the current problems of existing liquid and gel electrolytes and overcome the challenges of existing solid-state electrolytes. These hexacyanometallates offer high lithium-ion conductivity, tunable electronic properties, and simple solution synthesis, which make them ideal candidates for solid electrolytes in batteries.

Solid-state lithium-ion batteries with this electrolyte could power future generations of portable electronics and electric vehicles where energy density and long lifetime are critical.



A solid electrolyte enables the use of high-performance electrode materials (e.g. lithium metal for the anode) that can dramatically improve energy density.

Stage of Development

- Demonstrated promising lithium-ion conductivity in several representative hexacyanometallates, including: manganese hexacyanoferrate, cobalt hexacyanoferrate, and copper hexacyanoferrate
- Demonstrated tunable electronic properties in the hexacyanometallate system based on synthesis conditions
- Continuing research to demonstrate proof-of-concept cell

Applications

- **Solid-state metal-ion (Li, Na, K) batteries** for use in portable electronics, electric vehicles, and grid-scale energy storage

Advantages

- Safer and more stable than liquid organic electrolytes
- High lithium-ion conductivity
- Robust mechanical properties
- Tunable electronic properties
- Easy aqueous synthesis from low-cost precursors

Patents

- Published Application: 20170069931
- Issued: 10,333,171 (USA)

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