AzTE Arizona Technology Enterprises

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# Electrochemically Stable Ambient Temperature Electrolytes

**AzTE Case #716**


## Inventors

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## Intellectual Property Status

U.S. Patent 5,855,809


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## Background

As mobile electronics continue to evolve, the need for high-output, long-lasting rechargeable batteries has grown tremendously. In the search for suitable materials from which to construct high energy density batteries, one of the principal obstacles has been the provision of a suitable electrolyte that exhibits the right combination of conductivity and ion mobility, stability, and wide electrochemical window. Very few electrolytes have been developed thus far that exhibit the above combination of performance parameters. Despite significant research in the area, there remains a need for improved electrolytes that can be easily incorporated into voltaic cells without significant extra cost.

## Invention Description

Researchers at Arizona State University have developed a new class of liquid electrolytes which comprise the reaction product of a strong Lewis acid with an inorganic halide-donating molecule. The resulting electrolytes are stable, highly conductive, and have a wide electrochemical window. As such, they are excellent targets for use in rechargeable electrochemical devices such as batteries.

## Development

This technology part of a suite of electrolyte and battery technologies developed at Arizona State University. Significant testing has been completed, and the results have been published. At this time, AzTE is seeking potential partners and licensees for this issued patent and related technologies.

## Potential Applications

- **Rechargeable Batteries**
- **Fuel Cells**
- **Photovoltaic Cells**
- **Gas Sensors**
- **Other Electrochemical Applications**

## Benefits and Advantages

- **Very High Stability** – The electrolytes are stable in the liquid phase. Additionally, they are highly resistant to degradation in the presence of alkali metals.
- **High Solubility** – The electrolytes can dissolve large mole fractions of most electrolyte solutions including alkali salts.
- **Wide Temperature Range** – The electrolytes offer high conductivity from room temperature down to -40° C, and are less volatile than others.
- **Wide Electrochemical Window** – The electrolytes have a wide electrochemical window, ranging from 4 to in excess of 5 volts.