AzTE Arizona Technology Enterprises

www.azte.com

Lithium Ion Conducting Ionic Electrolytes

AzTE Case #671

Inventors

Dr. Austen Angell

Regents Professor

Department of Chemistry and Biochemistry, Arizona State University

Dr. Changle Lui

Former Professor

Department of Chemistry and Biochemistry, Arizona State University

Dr. Kang Xu

Former Postdoctoral Research Assistant

Department of Chemistry and Biochemistry, Arizona State University

Intellectual Property Status

U.S. Patent 5,484,670

Contact

Bill Loux

Director of Business Development

Arizona Technology Enterprises, LLC (AzTE)

480.884.1996 main

480.884.1992 desk

Email: bloux@azte.com

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 viscous electrolytes which combine lithium salts with high molecular weight anionic polymers. The resulting electrolytes are stable, highly conductive, resist crystallization, 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 large 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

- **Primary and Secondary Batteries**
- **Photochromic Devices**
- **Solar Cells**

Benefits and Advantages

- **High Conductivity** – exceptionally high conductivity at temperatures of 100 degrees or lower (including room temperature).
- **Cation Conductivity** – avoids undesirable cell polarization problems.
- **Rubbery Consistency** – permits the deformation of the electrolyte as needed to accommodate volume changes during charging and discharging cycles
- **Wide electrochemical window** – permits the utilization of anode/cathode combinations which provide high voltages
- **Good adherence to the electrode surfaces** – prevents mechanical/electrical problems that could otherwise develop during charging and discharging cycles