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Low-Cost Liquid Electrolytes For Room-Temperature Fluoride Ion Batteries

Tech ID: 33960 / UC Case 2024-99B-0

BRIEF DESCRIPTION

This invention introduces a groundbreaking liquid electrolyte for fluoride-ion batteries, offering high electrochemical stability, superior ionic conductivity, and excellent thermal stability.

FULL DESCRIPTION

The disclosed technology pertains to a novel class of liquid electrolytes designed for use in fluoride-ion batteries (FIBs). These electrolytes demonstrate an unprecedented electrochemical stability window of above 11 V, ionic conductivity greater than 3 mS/cm, and thermal stability up to 200°C. Comprising commonly available and inexpensive industrial chemicals, the electrolytes can be based on organic, aqueous, or aqueous-organic systems, including the salt, solvent, and diluent components.

SUGGESTED USES

- » Manufacturing of fluoride-ion batteries for consumer electronics.
- » Energy storage solutions for renewable energy systems.
- » Electric vehicles requiring high energy density and thermal stability.
- » Portable power sources with enhanced safety and lower environmental impact.

ADVANTAGES

- » Extended electrochemical stability window of above 11 V, enabling broader application in high-voltage systems.
- » Superior ionic conductivity (> 3 mS/cm), facilitating efficient charge transport.
- » Excellent thermal stability up to 200°C, ensuring performance under extreme conditions.
- » Cost-effective production from commonly available industrial chemicals.
- » Compatibility with both organic and aqueous systems, offering flexibility in battery design.

PATENT STATUS

Patent Pending

RELATED MATERIALS

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OTHER INFORMATION

KEYWORDS

fluoride-ion batteries, liquid electrolytes, organic electrolytes, organic-aqueous electrolytes, localized high-concentration electrolytes, room-temperature batteries, portable electronics, electric vehicles

CATEGORIZED AS

- » **Energy**
 - » Storage/Battery
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