Title and Research Team

- Title: Development of High-Energy and Low-Cost Semi-Solid Sodium Batteries Operating at Extreme Cold Temperatures
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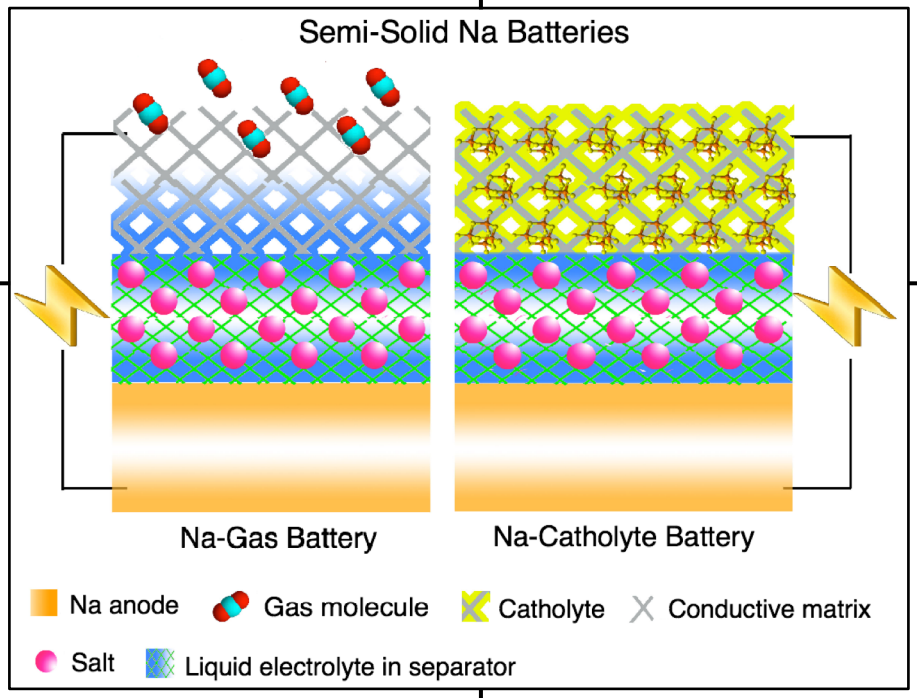
Research Objectives

- Innovation: Development of groundbreaking high-energy and low-cost semi-solid Na batteries for extreme cold environments.
- Performance projection: Operating temperature: <−40°C; Specific energy: >300 Wh/kg at satisfying rate; Lifetime/cycle life: years
- Outperform the SOA in terms of performance parameters
- Start TRL: 2
- End TRL: 3



Schematics of the proposed semi-solid Na batteries

Approach

- Electrode fabrication with finely tailored compositions/ architectures.
- Rational design, synthesis and characterization of novel high-capacity cathodes.
- Electrolyte-electrode interfacial tuning to achieve highly stable anode.

Potential Impact

- Lead to dramatic low-temperature performance improvements.
- Serve as new affordable & sustainable power sources for NASA's future planetary science missions
- Enable lower cost and longer duration missions without the need for ancillary thermal systems.