Lithium Batteries using Solid State Electrolytes

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

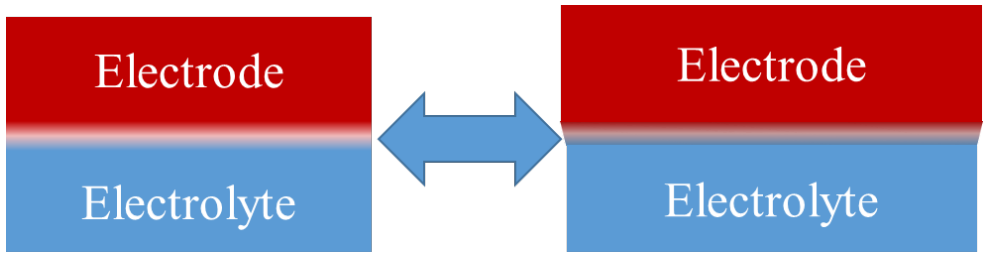
PI/Co-PI: Zonghai Chen (ANL)

- ***Objective:*** To understand and design functional solid/solid interface for long life and high energy density all solid state batteries.

Impact:

- To improve the energy density and safety of lithium batteries.
- To enable the safe and durable use of lithium metal electrode.

Title of Graph/Concept



a. Chemical compatibility

b. Mechanical fatigue

This project will be focusing on the interfacial design to improve the chemical stability and mechanical stability of electrode/electrolyte interface for efficient mass transport of lithium ions for all solid state batteries.

Accomplishments:

- NEW START

FY 19 Milestones:

- Investigating the tetragonal-cubic phase transformation of LLZO electrolyte.
- Investigating the impact of doping on the behavior of tetragonal-cubic phase transformation.
- Initiating the investigation of the chemical stability cathode/LLZO interface.

FY19 Deliverables: Publications to report new findings of the kinetic study.

Funding:

— FY19: $433K, FY18: 0, FY17: 0