Solid-State Battery Cell (Model GT01, GT02, GT03)

Description

Mature commercial lithium batteries employ organic liquid electrolytes. However, the deficiencies of liquid electrolytes, such as low thermal stability and low flash point, may give rise to non-negligible safety issues like battery combustion and explosion. All-solid-state lithium batteries that utilize solid electrolytes can precisely address the aforementioned problems. Compared to lithium batteries with liquid electrolytes, they possess higher safety and energy density and boast broad market prospects in domains such as electronic products and hybrid vehicles. Nevertheless, solid electrolytes still encounter numerous challenges in practical application and development.

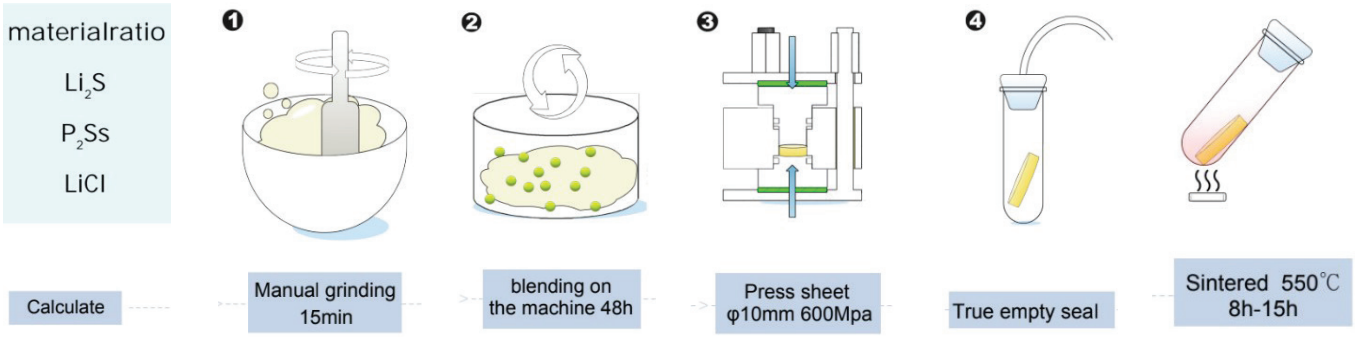
In contrast to traditional organic liquid electrolytes, the solid-solid interface contact between the solid electrolyte and the electrode in solid-state batteries is relatively poor, which significantly increases the interface impedance and hinders ion transport and battery capacity release. The interface impedance is related to many experimental factors, such as the pressure between the electrode and the electrolyte in the battery. Therefore, the utilization of specialized custom molds is of paramount importance for the research of solid-state batteries.

The GT01 version is a simplistic one, featuring smaller overall dimensions and lighter weight, and is suitable for research in confined spaces and with low costs. Compared to GT01, GT02 has increased overall dimensions and weight, higher strength, and incorporates a hand-tightening sealing ring for convenient sealing and deflation. In contrast to GT02, GT03 has enhanced pressure stability. The previous method of applying pressure by tightening three nuts has been replaced by tightening a central large nut, eliminating the problem of force eccentricity caused by different torques of the three nuts. Additionally, a high-strength pressure-stabilizing spring has been added, further improving pressure stability during the testing process.

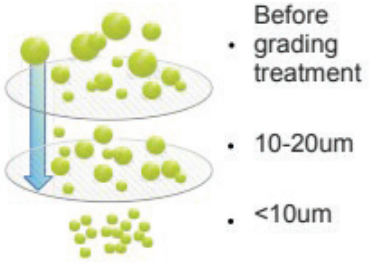
The lithium ionic conductivity of a solid state electrolyte material can be measured by pressing the solid electrolyte material between the two working electrodes.
When doing a liner sweep voltammetry (LSV) test, the electrolyte membrane is sandwiched between the working electrode and the lithium metal foil, which is used as a counter and reference electrode.

Using the schematic representation of Solid-State Battery Cell

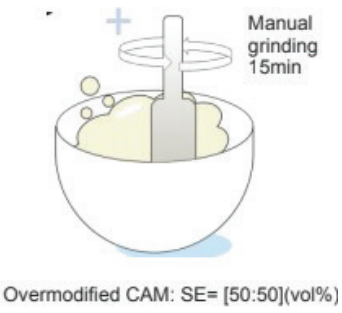
1. Synthesis of Solid Electrolyte Materials



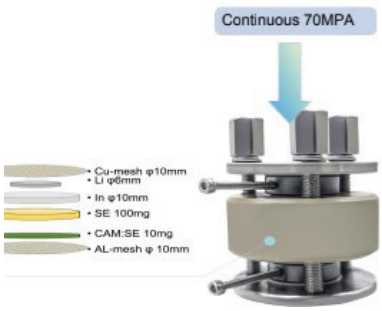
2. The Particle Classification of the Solid Electrolyte Material



3. Preparation of the Composite Positive Electrode



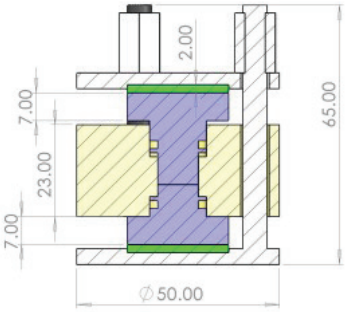
4. Battery Preparation



GT01

Continuous 70MPA

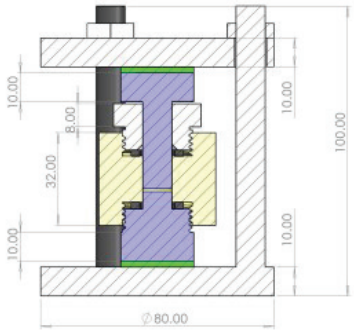
- **Can be Modified - Double Seal Version/High Pressure Version or other**



GT02

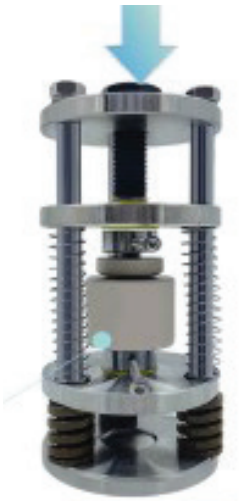
Continuous 70MPA

- **Can be Modified - Double Seal Version/High Pressure Version or other**
- **Easier to vent compared to GT01**

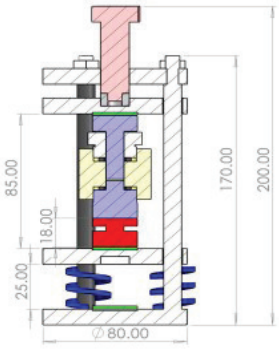


GT03

Continuous 70MPA



- **Can be Modified - Double Seal Version/High Pressure Version or other**
- **Superior pressure stability compared to GT01 GT02**



SPECIFICATIONS - GT01, GT02, GT03	
Interior Diameter	6-20mm (10-12 are commonly used size)
Maximum Working Pressure	800 MPa
Maximum Working Temperature	250 °C
Sleeve Material	Polyether ether ketone (PEEK)
Pushing rod Material	Mold steel (Chrome Plated)
Frame Material	Stainless Steel

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