**in-situ SEM observation of all solid lithium battery**

By SEM observation of all-solid-state battery while charge and discharge, it is possible to detect the morphological changes of constituent materials and the changes of element distribution. Here, we introduce the *in-situ* observation of all-solid-state battery using sulfide-based solid electrolyte.

### **in-situ** SEM observation

- Available under (1) inert atmosphere, (2) pressure and/or restriction to sample, (3) Voltage application (4) sample heating
- Suitable for in-situ observation for all solid state batteries
- Information of morphological and composition changes (Li insertion / desorption, etc.) can be obtained
- Possible to evaluate the same sample by Raman and TOF-SIMS

#### Composition of all solid state battery

**Cathode** 70 µm : NCA / LGPS

**SE layer** 800 µm : Li₆PS₅Cl

**Anode** 100 µm : Graphite / Li₆PS₅Cl

### Charge and discharge condition

- **0.1 C CC**
- **Voltage range**
  - 2.7 ~ 4.5 V

Sample was provided by Dr. Tabuchi, AIST, Japan

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Visualization of gap and crack between active material and solid electrolyte during charge / discharge process