

One stop analytic service of Lithium ion Battery

Toray Research Center is providing characteristic evaluation of LIB through pilot making, safety testing and disassemble analysis to support customer's research & development of LIB.

Trial Production

Trial manufacturing from the ingredient (e.g. active material) from customer

- Electrode plate : Stirring ⇒ Pasting ⇒ Pressing, Cut, Dry
- Assembling : Welding ⇒ Stack, Winding ⇒ Implantation ⇒ Sealing

Available battery : Coin, Laminated, Prismatic type



Safety testing

Conducting various safety testing on demands

- Electrical testing : Over charging, external short circuit testing
- Thermal testing : Heating testing (Floating, Cyclic testing)
- Mechanical testing : Crush, Nail penetration, Drop testing

Compositional analysis of effusive gas is also available

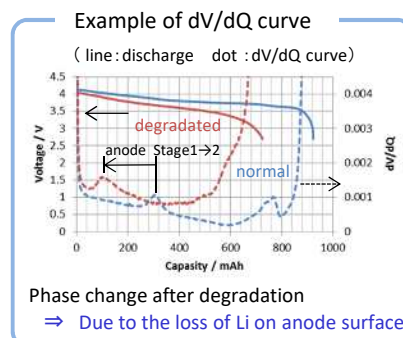


Over charging test of cylindrical battery

Evaluation

Evaluation of electrical property, non destructive inspection

- Electrical property :
 - Capacity measurement for initial, rate, cyclic property
 - Impedance
 - dV/dQ analysis
- Non destructive :
 - Inner structure by X ray CT
 - Crystal structure, valent change analysis by *in situ* measurement (XRD, XAFS)



Disassembling

Analysis of each part of battery after various testing

- Morphological observation : SEM, TEM
- Compositional dispersion : SEM-EDX, RBS, GD-OES
- Crystal • Chemical structural analysis : STEM, RAMAN, XRD, NMR
- Composition of SEI : XPS, TOF-SIMS, IC, CZE, NMR
- Composition of Electrolyte : GC/MS, LC/MS, NMR

Comprehensive analysis is available about the characteristics of battery with technical discussion for the degradation mechanism through the briefing session.

Integrated analytical services for battery is TRC's forte