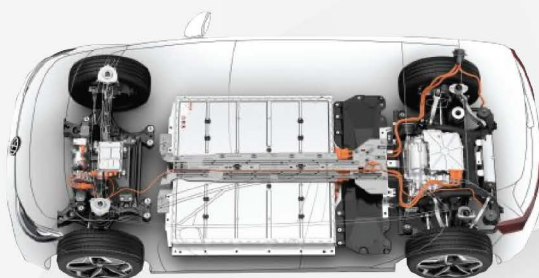


## Li-Ion Batteries: Materials Characterization Service



### Materials Analysis



### Why Work with Us?



**Expertise in LIB Materials Analysis**  
Highly experienced with advance technology



**Affordable Price**  
Up to 40% lower than industry pricing



**Free Consultation**  
Before and after service



**In-Depth Data Interpretation**  
As a second opinion to yours



**Quality Assurance Program**  
Free remeasurement if not satisfied

### Advanced Applications



#### Objective

Solid Electrolyte Interface Analysis

Atomic Level LIB Materials Evaluation

Nanoscale Chemical LIB Mapping

3D Evaluation of Separator



#### Solution

XPS

TEM-EDS

ToF-SIMS

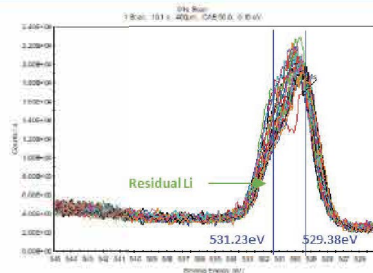
X-Ray

### Li-Ion Battery Applications

Cathode	<b>Structure, composition, stability &amp; elemental distribution</b> BET, FTIR, ICP-OES, Nano-SIMS, SEM-EDS/FIB Cross-section, TEM-EDS/EELS, TGA-MS, ToF-SIMS, XRD, and XPS
Anode	<b>Structural characterization, thermal stability</b> BET, FTIR, ICP-OES, Nano-SIMS, Raman, SEM-EDS/FIB Cross-section, TEM-EDS/EELS, TGA/DSC, ToF-SIMS, XRD, and XPS
Separator	<b>Morphology, porosity, stability</b> AFM, FTIR, SEM-EDS, XRD, Tensile strength, TEM-EDS/EELS, TGA/DSC, and X-ray 3D CT
Electrolyte	<b>Elemental and compound impurities</b> GC-MS, ICP-OES, LC-MS/MS, and XPS

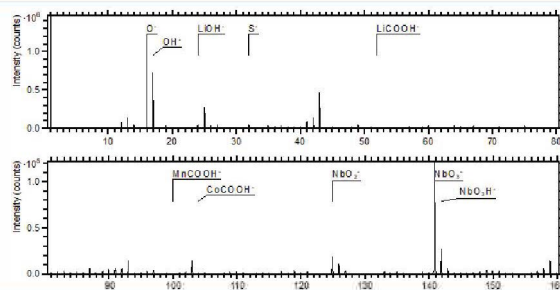


## X-Ray Photoelectron Spectroscopy



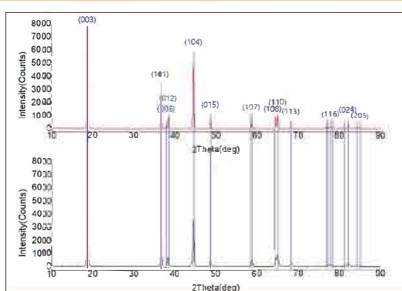
Identify the chemical environment of oxygen

## ToF Secondary Ion Mass Spectrometry



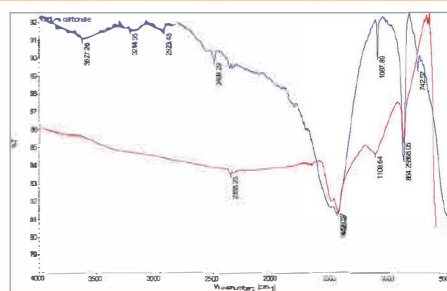
Cathode-electrolyte interface analysis

## X-Ray Diffraction



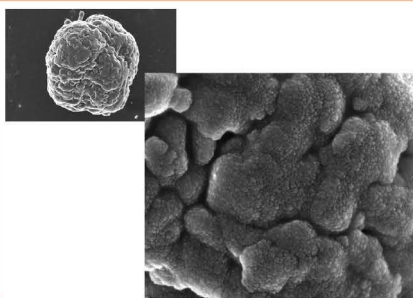
Crystal structures of electrode material

## Fourier-Transform Infrared Spectroscopy



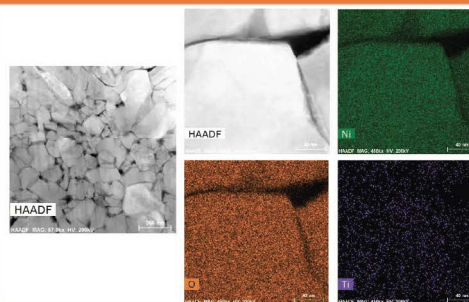
Determination of residual Li-ion

## FIB Scanning Electron Microscopy



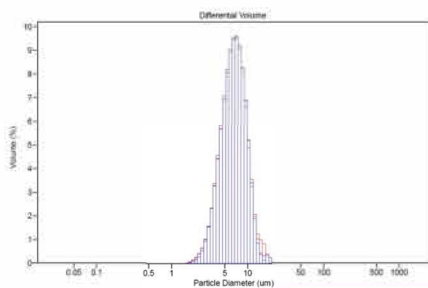
Morphology evolution

## (Cs- or HR-) TEM with EDS/EELS



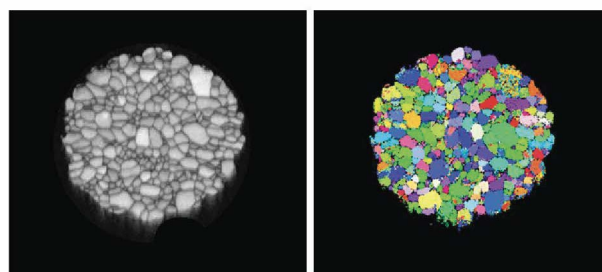
Nanoscale chemical mapping of cathode

## Laser Diffraction



Particle size distribution

## Electron Back-Scatter Diffraction



Electrode particle architecture