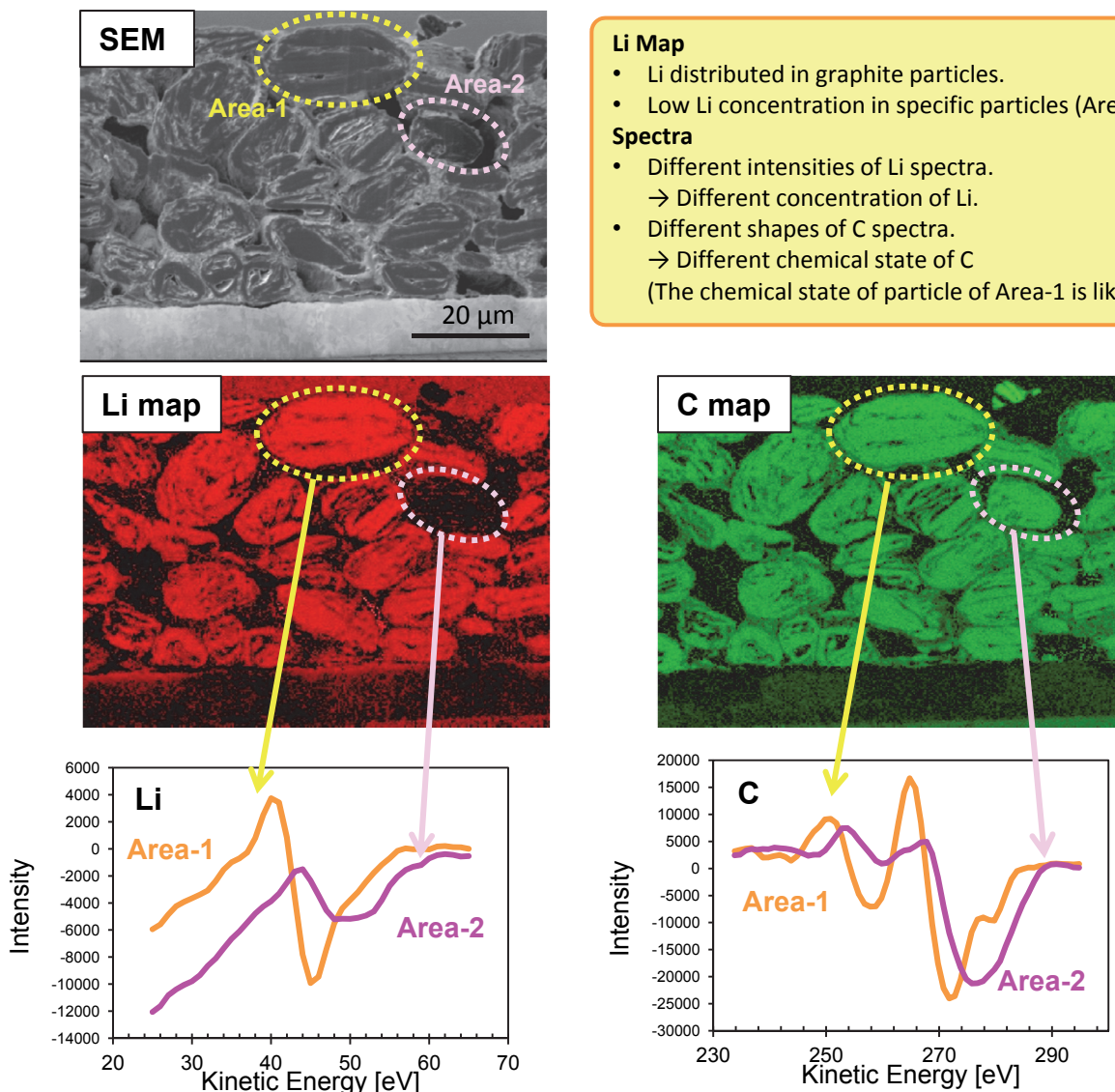


Cross sectional Li imaging in negative electrode of lithium ion battery by auger electron spectroscopy

Auger electron spectroscopy (AES) is a powerful technique to detect elements on material surfaces in order of several nm and to observe elemental distributions with sub-micron of spatial resolution due to a focused electron beam. Therefore, we can obtain cross sectional Li distributions in negative electrodes of lithium ion batteries (LIBs) by AES.

Li distribution in graphite negative electrode with SOC 100 % SOC : State of charge

The cross sections of the graphite negative electrode with SOC 100 % are prepared by broad ion beam method. Then, the cross sectional images are obtained by AES.



Li Map

- Li distributed in graphite particles.
- Low Li concentration in specific particles (Area-2).

Spectra

- Different intensities of Li spectra.
→ Different concentration of Li.
- Different shapes of C spectra.
→ Different chemical state of C
(The chemical state of particle of Area-1 is like a carbide)

Optimizing the preparation of cross sections (e.x. non air exposure, cooling) and the measurement conditions to suppress the Li degradation and diffusion, we can obtain the Li distributions in graphite negative electrodes of LIBs.