

Key Word: Li-ion battery, cathode materials, transition elements

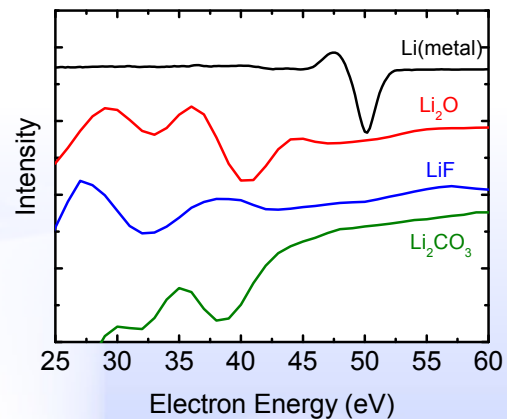
What a wonderful tool to detect Li easily !

A Li-ion battery is widely used for a power supply of cellular-phones, mobile PCs, and latest electric vehicles because it is a light-weighted rechargeable battery with higher electric power capacitance. A Li-ion rolled a important electric carrier between a cathode and an anode; the cathode is made of polymers and some transition metal oxides including Li and the anode is made of graphite. It is investigated by a lot of researchers to reveal any feature of Li and develop more powerful Li-ion battery.

The new Auger instrument (JAMP-9510F) can detect Li clearly in short time. These are some Auger application data for a cathode made of LiFePO_4 in below.

Standard spectra of Lithium in several chemical state

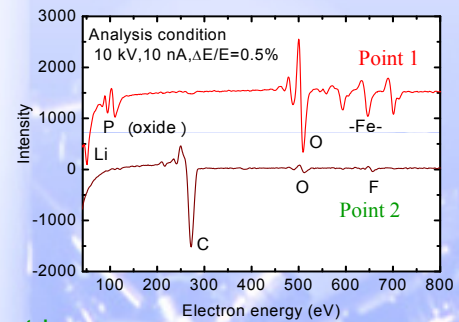
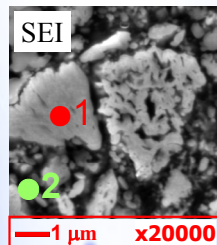
The Auger spectrum of Li has different peak positions in a unique spectrum shape depending on its chemical states.



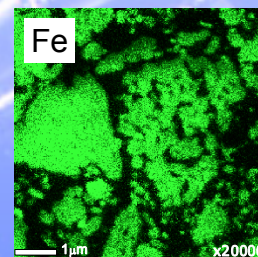
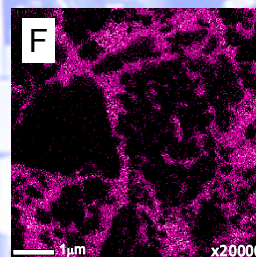
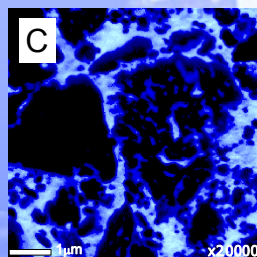
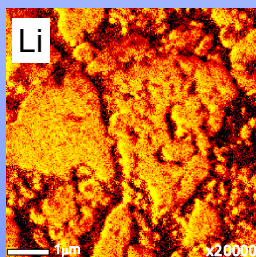
Cross-section of Cathode

Li can be detected clearly by electron beam

- All constituent elements (Li, O, P, Fe) are detected at a particle of LiFePO_4
- Constituent element of polymer (C, O, F) can be detected definitely at a polymer matrix part.



Point 1 : particle
Point 2 : polymer matrix



Advanced peak deconvolution method

- Advanced peak deconvolution method can evaluate the oxidation number of iron (Fe^0 , Fe^{2+} , and Fe^{3+}) at a particle in the cathode with higher energy resolution spectra of Fe LMM.
- It can separate correct Li KVV spectra from even a practical spectrum overlapped several Auger peaks of other elements.

Access the QR codes below for more information on the Field Emission Auger Microprobe

◆ Overview →



◆ Mechanisms →



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