In situ Measurements of Degradation Process in Lithium Ion Batteries by micro-Raman, NMR/MRI and Acoustic Emission.

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Degradation mechanism in lithium ion battery (LIB) is a key issue in recent study of LIB for Electric Vehicles (EV), which relates the safety and cost problems.
In this seminar, some new in situ techniques to observe the degradation process in lithium ion batteries will be demonstrated, which we have been developed in NEDO project.

1. in situ micro Raman scattering of positive electrodes (LiCoO2, LiMn2O4) in liquid and solid electrolytes, in which the degradation of cathode materials are observed.
2. in situ observation of LIB by Nuclear Magnetic Resonance (NMR) and NMR micro-Imaging (μMRI),in which were observed the degradation of electrolyte and positive electrodes.
3. in situ Acoustic Emission (AE) from LIB materials while charge/discharge process, which is useful to observe the fracture and crack of cathode/anode materials due to phase transitions.