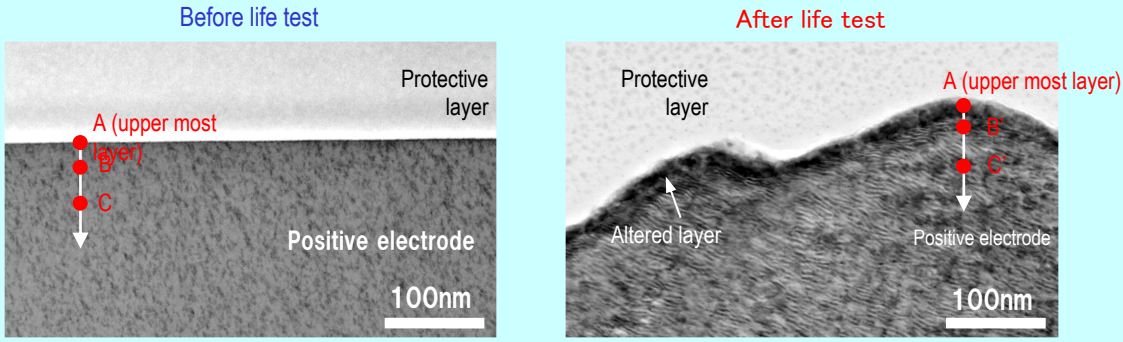
mc nac Technical Note

Lithium Ion Secondary Battery
Comparative Analysis of Performance of Positive Electrode Material between Before and After Life Test

Summary

EELS analysis in the depth direction is effective for evaluating the positive electrode material whose performance has declined due to life test conducted on a lithium ion secondary battery.
Equipment: Field emission-transmission electron microscope (FE-TEM)
Function: Electron energy loss spectroscopy (EELS)

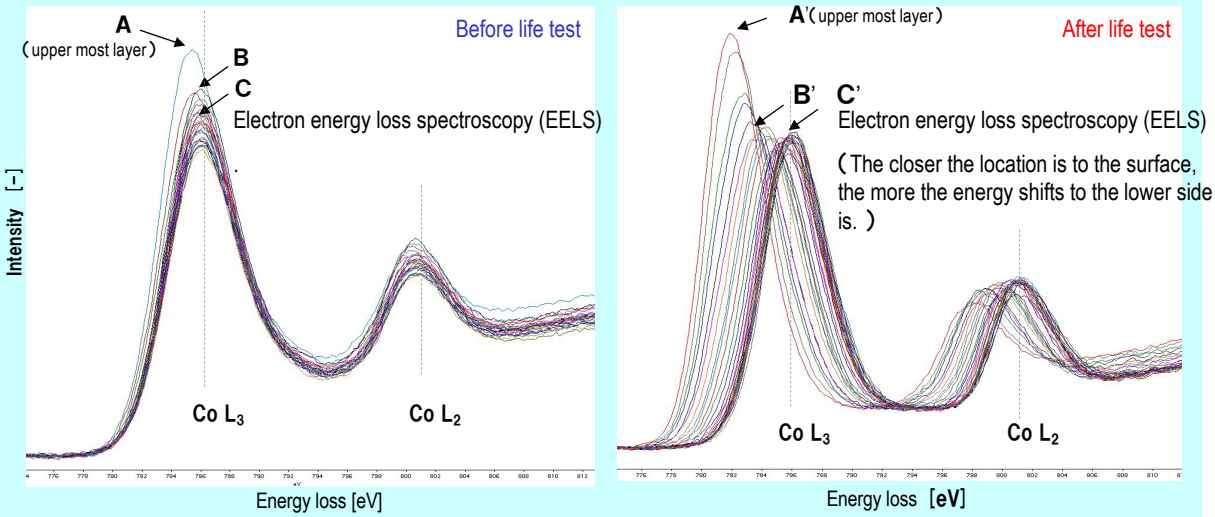
transmission electron microscope (FE-TEM) of the positive electrode material



An altered layer (black) was observed on the positive electrode surface after life test.

Electron energy loss spectroscopy (EELS) spectrum of the positive electrode material

Comparison of EELS spectrum near the Co-$L_{2,3}$ edge in the depth direction



Low-valence Co oxide is formed on the positive electrode surface due to degradation. Because of this, Co-L_{23} edge shifted to the low energy side on the side of the positive electrode surface after life test.

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