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# Nondestructive determination of Li concentration and distribution in prismatic Li-ion battery

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Li-ion batteries' (LIBs) popularity is a result of their outstanding characteristic, in particular high capacity, long lifetime, no memory effect. Among different form factors, the prismatic cells are mostly used for small electronics, but they also become an attractive option for e-mobility applications in the latest years. Among various experimental tools, the powder diffraction has been a proven one for studies of Li-ion batteries. In particular, synchrotron and neutron radiations enable non-destructive probe of structure for LIB components and their constituents under real and non-ambient operating conditions. 2D Li distribution inside the prismatic cell for the anode and the cathode can be traced by utilizing high-energy X-ray diffraction. Employing neutron diffraction with a thermal monochromatic neutron beam both ex-situ and in-situ/operando studies of prismatic LIBs are possible as it was recently reported.
In the current contribution, a fresh and electrochemically aged commercial prismatic LIBs used in the iPhone 6 were inspected by both X-ray diffraction radiography and neutron powder diffraction. Neutron diffraction allowed the evaluation of the overall structural changes of cell constituencies in the prismatic LIB, which were correlated to electrochemical treatment, where the changes of 2D Li distribution were determined with high energy X-ray diffraction.

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