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Type: **Talk (20 min + 5 min discussion)**

## **Operando investigation of the electrolyte uptake of the electrodes in 18650-type Li-ion batteries**

*Thursday 5 December 2024 16:15 (25 minutes)*

During the operation of Li-ion batteries, Li-ions are exchanged between the cathode and the anode of the battery. During this exchange, the lithium gets extracted (deintercalated) from one electrode and inserted (intercalated) into the other electrode. During this mass transport the structure of the materials changes, which leads to and volume expansion/contraction of the electrode materials. As these volume changes of the materials are non-linear, the liquid electrolyte get soak into / pressed out of the liquid electrolyte [1].

In this contribution, the theoretical changes of the electrode material were related to the operando liquid electrolyte excess measured with neutron radiography visible inside the center pin of the cell. The results have shown the correlation between the electrolyte uptake of the electrodes and the non-linear volume changes of the electrode materials.

1. Ziesche, R.F., et al., 4D imaging of lithium-batteries using correlative neutron and X-ray tomography with a virtual unrolling technique. *Nature Communications*, 2020. 11(1): p. 777.

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