Applications:

- Characterization of materials for energy
- Study of the degradation stage in lithium-ion batteries

2D and 3D quantitative imaging of lithium in electrode materials

This technique probes the electrode material with a slight ion microbeam of several MeV in energy, up to a depth as large as twenty microns.

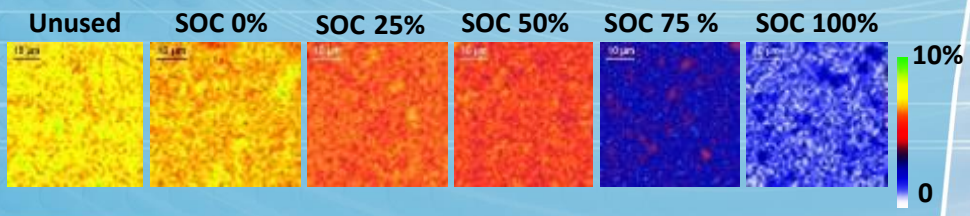
The induced nuclear reactions allow quantitative and accurate imaging of lithium in the electrodes of the battery with 1 μm^3 resolution, allowing to monitor the evolution of the material.

Features:

- Non-destructive method
- Lithium concentration measurement
- Ability to map out the fading process
- Visualization of the electrode ageing stage

Example: Electrode analysis for lithium-ion batteries

Lithium distribution according to the state of charge (SOC)



"Nuclear microanalysis of lithium dispersion in $LiFePO_4$ based cathode materials for Li-ion batteries"
A. Habrioux, S. Surblé, P. Berger, H. Khodja, A. D'Affroux, S. Mailley, T. Gutel, and S. Patoux,
Nuclear Instruments and Methods in Physics Research B **290** (2012) 13.

Technological Sheet

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