X-Ray Absorption Spectroscopy studies on battery active materials

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Abstract:

X-ray absorption spectroscopy (XAS) is one of the most powerful techniques to investigate the electrochemical mechanisms occurring in energy storage materials [1-2]. XAS is a site selective technique therefore it provides important information on the electronic state of the absorbing atoms and the local structural environment around them. Differently from x-ray diffraction, XAS does not require long range order and therefore amorphous, liquid and strongly disordered materials can be studied as well. Moreover, XAS is both a surface and a bulk sensitive technique, depending on the detection mode and the incident energy. Thanks to its peculiarities, XAS has been widely used to investigate the redox phenomena and the local structural evolution in Li and Na-ion batteries [3-6].Understanding the working mechanism of an electrode material at the local scale is fundamental to developing better materials and the key to this is the real-time investigation, i.e. in *operando* conditions. We present some examples of *operando* XAS studies on Li-ion batteries, providing a deeper understanding of the phenomena occurring in electrodes.

Contribution: Invited x

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