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Synchrotron based techniques for studying energy storage materials

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Synchrotron radiation with high flux and high resolution gives us information that would not be possible from laboratory X-ray instruments. Synchrotron X-rays are available as an extremely intense beam that allow fast scattering or diffraction studies of energy storage materials. At synchrotron sources various techniques at different beamlines offer structural and chemical information on different time and length scales. For example, in-situ X-ray powder diffraction (XRPD) uses the high intensity and resolution of synchrotron radiation for fast studies of phase transitions and detailed structure solution of novel compounds, while X-ray absorption spectroscopy (XAS) uses the energy tunability properties of synchrotron radiation to provide inter atomic distances, bonding valence, and oxidation states of the samples. This presentation will describe some case studies of the energy storage materials undertaken at the PD and XAS beamlines and demonstrate the method to the user community.

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