

## **Solid State NMR and Synchrotrons X-ray Spectroscopic investigation of SnO-Based Lithium-Ion Battery Anodes**

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Oxides of tin have recently received a great deal of attention as promising new anode materials for high capacity lithium ion batteries. In principle, the partially reversible reaction between Li and SnO is relatively simple, but some of the important details that can affect cell lifetime and capacity are not well understood. Two different spectroscopic methods have been applied to a series of samples, with Li/SnO molar ratios varying between 0.5 and 6.4, synchrotrons x-ray absorption at the Sn K- and L- edges, and solid state  $^7\text{Li}$  NMR. The former yields information about the average Sn oxidation state and atomic coordination, the latter provides knowledge concerning the Li ionic environment. Of particular interest in this investigation are correlations between features in the voltage vs. capacity curve and spectroscopic parameters which reflect the structural and chemical environments of the metal ions.