

Electrochemical Energy Storage Materials and Systems: Insights from In-situ and Operando Diffraction

Amy C. Marschilok, Esther S. Takeuchi, Kenneth J. Takeuchi
Stony Brook University

Insights regarding the function of electrochemical energy storage materials and systems gained from in-situ and operando diffraction measurements will be the focus of this presentation. Complementary spectroscopy and ex-situ measurements will also be discussed. Diffraction measurements can track the progress of conversion reactions in which the crystallographic structure of the active material changes as a result of the redox process. For electrochemical energy storage materials which undergo insertion (i.e. (de)lithiation) with retention of the parent structure, diffraction measurements can also provide important information. The opportunity for visualization of structural evolution and locational differences within a bulk electrode can provide particular insight regarding the functional capacity of energy storage systems with implications for utilization of energy storage materials. In this presentation, we will strive to present progress to date in each of these areas.

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