

Seminar



Wednesday, September 27, 2017

11:00 AM – 206 Furnas Hall

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Analysis and Characterization of Transport in Electrochemical Energy Storage

Electrochemical energy storage technologies, in the form of batteries or fuel cell/electrolysis systems, play a pivotal piece in many future visions of sustainable energy infrastructures. The commercial, engineering, and scientific interest in batteries is high because of their role in the electrification of transportation and in the stabilization of any electrical grid that is dependent on significant percentages of renewables. Development and optimization of batteries for a particular application is difficult because they are inherently complex, with various multiscale materials (and the interfaces between them). The complexity of the batteries is required to engineer conditions that allow electrochemical transport processes to occur at a sufficient rate to satisfy application requirement at an acceptable cost. We discuss theoretical and experimental studies that outline the challenges in understanding transport in two cathode materials. The challenges arise from the multi-scale nature of the cathodes, analysis of advanced characterization methods, and a multitude of chemical and electrochemical reactions and phase changes that are closely coupled to the transport phenomena.

Refreshments at 10:45