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Type: **Invited Speaker Abstract**

Using Neutron Reflectometry to Probe Electrode-Electrolyte Interfaces of Si Anodes

Silicon based anodes have been of interest due to their large specific capacity (3579 mAh/g) when compared to traditional graphite based electrodes currently used in Li-ion batteries. The limitation to wide scale application of Si is its characteristic poor calendar life and cyclability due to its inability to form a stable passivating layer known as the solid-electrolyte interphase (SEI). Most of our understanding of the SEI comes from ex situ characterization techniques that will inherently alter the chemistry of the layer due to the nature of sample preparation.

In this talk, I will highlight how we have used neutron reflectometry (NR) to study the SEI of silicon-based anodes in situ. Neutron reflectometry's ability to study buried interfaces has allowed us to track the formation of the SEI, as we lithiate/delithiate the anode, and allowed us to follow changes in the SEI as a function of electrolyte additive, polymeric binders, conductive salts and pre-lithiation of the Si. Lastly, I will highlight how we have recently used the NR to probe next generation solid-state batteries.

Topic

Energy Storage

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