MSE SEMINAR

September 29, 2017
113 McBryde Hall
3:30 – 4:30 PM
Refreshments at 3:00 PM

Professor Feng Lin

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"Materials Electrochemistry in Rechargeable Batteries for Electric Vehicles and Grid Energy Storage"

Abstract

Electrochemical energy storage devices (e.g., rechargeable batteries) lie at the heart of electrochemistry and impose significant challenges for materials science in increasingly demanding high–energy–power applications such as electric vehicles and grid electricity storage. At Virginia Tech, our research is positioned at the crossroad of interdisciplinary energy research, with the ultimate goal of achieving unprecedented control of materials properties for next-generation battery applications as well as contributing to the fundamental progress of materials electrochemistry and solid state chemistry. In this talk, we will highlight our recent progress in understanding and improving electrode materials for lithium and sodium batteries. Chemical evolution and structural transformations at the surface of electrode materials influence greatly the key performance metrics of these batteries. We design novel synthetic approaches to overcome the surface challenges of oxide cathode and anode materials and develop lithium and sodium batteries with high energy density, high power density and excellent cycle life in the lab. We also employ multiscale synchrotron and electron spectroscopic and imaging techniques to investigate materials electrochemistry and to generate a chemical basis for designing safe, affordable, and long-life alkali metal batteries.

Bio

Dr. Feng Lin is currently an Assistant Professor of Chemistry, with a courtesy appointment in the Department of Materials Science and Engineering at Virginia Tech. He holds Bachelor's degree in Materials Science and Engineering (2009) from Tianjin University, and MSc degree (2011) and PhD degree (2012) in Materials Science from Colorado School of Mines. Prior to Virginia Tech, Feng worked at QuantumScape Corporation as a Senior Member of Technical Staff, Lawrence Berkeley National Lab as a Postdoctoral Fellow, and National Renewable Energy Lab as a Graduate Research Assistant. Feng is fascinated by energy sciences, materials electrochemistry and synchrotron X-rays.