



call for papers

225th ECS Meeting, Orlando, FL, May 11-16, 2014

BATTERY & HIGH TEMPERATURE MATERIALS SYMPOSIUM

Mechanical-Electrochemical Coupling in Energy Related Materials and Devices

Significant coupling often exists between the electrical, chemical and mechanical responses of the materials used for batteries, fuel cells, chemical separators, and other high performance energy conversion/storage devices. In these systems, electrochemical reactions affect stress evolution, deformation, and fracture. Similarly, stress evolution, deformation, and fracture can also affect electrochemical properties, device performance, and durability. This symposium will provide a forum for the presentation of original research concerned with the interplay between mechanics and electrochemistry. **Topics of interest include, but are not limited to, experimental and/or modeling studies of:**

- a) the effect of stress and strain on: the surface and bulk atomic structure of electrochemically active materials; the defect thermodynamics (point defect concentrations, chemical expansion coefficients, etc.) of electrochemically active materials; diffusion kinetics (diffusion coefficients, surface exchange coefficients, etc.); catalytic activity; the electronic structure of electrochemically active materials; reaction pathways; phase transformations (phase-boundary shifting, ferroelastic domain switching, strain-induced self-assembly, etc.) in electrochemically active materials; the microstructural evolution of electrochemically active materials; and the performance and durability of electrochemically active materials and devices.
- b) stress, strain, and/or fracture resulting from: electrochemical insertion; intercalation; phase transformations; electrode reactions; and other electrochemical processes and/or device operation;
- c) new approaches to understand, model and and/or control mechano-chemical coupling and/or degradation in electrochemical systems;
- d) novel *in-situ* and *ex-situ* characterization tools;
- e) electrochemical actuation based on Faradaic and non-Faradaic interactions
- f) mesoscale perspective on mechano-electrochemical interplay.

Confirmed invited speakers include: Bilge Yildiz (MIT), Brian Sheldon (Brown), Ting Zhu (Georgia Tech), Jake Christensen (Bosch), Sergei Kalinin (Oak Ridge National Lab), Igor Lubomirsky (Weizmann Institute), Jose Santiso (Centre D'Investigacio en Nanociencia I Nanotecnologica), and Tatsuya Kawada (Tohoku University).

Papers from this symposium will be considered for a planned September 2014 Journal of the Electrochemical Society Focus Issue on **Mechano-Electro-Chemical Coupling in Energy Related Materials and Devices**. All authors accepted for presentation are encouraged to submit full manuscripts for inclusion in either the JES Focus Issue or an "AFTER" meeting issue of *ECS Transactions*. The full manuscript submission deadline for both options is June 20, 2014.

Questions and inquiries should be sent to the symposium organizers: **Jason D. Nicholas** (Michigan State University, jdn@msu.edu); **Yue Qi** (General Motors R&D, yue.qi@gm.com), **Sean Bishop** (Kyushu University, bishop@i2cner.kyushu-u.ac.jp), and/or **Partha P. Mukherjee** (Texas A&M University, pmukherjee@tamu.edu).

Please visit <http://www.electrochem.org/meetings/biannual/225/> to submit your abstract. **The Abstract submission deadline is November 15, 2013.**

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