



The Electrochemical Society
Seminar Notice: Thursday, October 28, 2010

Modeling and Visualization of Li-ion Battery Deformation

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The mechanics and microstructure of electrodes are critical in determining the performance and durability of lithium-ion batteries, especially the new large format cells and packs developed for transportation applications. A multi-scale modeling approach, based on first principle calculations and continuum theory, is being developed to interpret these mechanical and microstructural changes. The results are compared with the first direct in-situ measurements of microstructural strain in a commercial graphite anode. Through the comparison of experimental measurement and theoretical analysis, the unexpected contraction during lithiation is explained by the stiffening of graphite upon lithiation, as predicted from first principle calculations. The results demonstrate the importance of integrating the SOC dependent material properties into Li-ion battery modeling.

Dr. Yue Qi is a Staff Research Scientist working on multi-scale modeling on various materials at Chemical Sciences and Materials Systems Lab, General Motors R&D Center. She completed her B.S. (1996) on Materials Science and Computer Science at Tsinghua University. She received her PhD in Materials Science from California Institute of Technology in 2001. She then joined GM as a Sr. Research Scientist in 2001. She has received 2009 GM Campbell awards for “Multi-scale Modeling of High-temperature Deformation in Aluminum” and “Fundamentals of Interfacial Tribology”, a 2006 GM Campbell Award for “Advances in Nano-scale Plasticity”, and was the co-recipient of the 1999 Feynman Prize in Nanotechnology for Theoretical Work with Dr. T. Cagin and Prof. W. A. Goddard III (PhD advisor). She has published over 40 journal papers.

Date: Thursday, Oct 28, 2010
Location: Lawrence Technological University
21000 West Ten Mile Road, Southfield, MI 48075
Building #5 (Taubman Welcome Center), 4th Floor, Room 406
Use Parking Lot A, C or D (Lots C & D are accessed off NW Highway)
Time: 5:30 pm Reception / 6:30 pm Dinner / 7:30 pm Speaker
Price: \$20 Members / \$22 Guests / \$10 Students **Payment:** Cash or Check
RSVP by: Tuesday, Oct 19, 2010 to Dr. Kimber Stamm
kimber.stamm_at_tema.toyota.com
<http://www.electrochem.org/ecs/sections/detr/detr.htm>



