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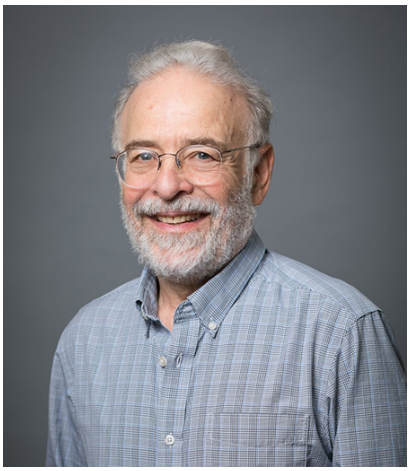
Frontiers in Catalysis Science and Engineering
Seminar Series

Operando Methods for the Study of Energy Materials



Héctor D. Abruña

Department of Chemistry & Chemical Biology and Energy Materials Center at Cornell University
Ithaca, New York

August 2 ♦11:00 am
EMSL 1077

This presentation will deal with the development of *operando* methods for the study and characterization of fuel cell and battery materials. The presentation will begin with a brief overview of the methods employed with particular emphasis on the use of X-ray diffraction (XRD), X-ray absorption spectroscopy (XAS) X-ray microscopy and tomography and transmission electron microscopy (TEM) under active potential control. The utility of these methods will be illustrated by selected examples including electrocatalysts for the oxygen reduction reaction (ORR) employing ordered intermetallic phases including the phase transformation from alloy phase to ordered intermetallic phase. Spectroscopic studies of Li/S batteries and Li metal deposition and dendritic growth will also be discussed. The use of operando TEM will be illustrated by studies of fuel cell catalyst degradation and coalescence and lithiation/de-lithiation dynamics of LiFePO4 via energy-filtered TEM. The presentation will conclude with an assessment of future directions.

The Abruña Group

Focuses on the development and characterization of new materials using a wide variety of techniques for fuel cells, batteries, and molecular assemblies for molecular electronics.

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Host: Zdenek Dohnalek
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