

ION INSERTION REACTIONS IN MATERIALS FOR BATTERIES & FUEL CELLS



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Lecture: 4:00-5:00 p.m.

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Reception at 3:15 p.m. – Benson Lobby

Abstract

Electrochemistry plays a crucial role in virtually all energy storage and conversion technologies, such as batteries, fuel cells, and artificial leaves. Ion insertion processes, such as those involving lithium and oxygen ions in solids, are ubiquitous. Unlike electrochemical reactions on metal surfaces, ion insertion reactions involve the two-way traffic of ions and electrons. However, despite the importance of these reactions, the microscopic nature of these processes remains mysterious. We are employing in-situ spectroscopy, microscopy, and computation to shed light on the detailed kinetics and thermodynamics of ion-insertion reactions. In this talk, I will present new insights on two important classes of electrochemical reactions (1) insertion of oxygen ions in oxide fuel cell electrocatalysts, and (2) intercalation of lithium ions in lithium iron battery electrodes.

Speaker Biography

An outstanding Will Chueh is an Assistant Professor in the Materials Science & Engineering department and a Center Fellow of the Precourt Institute for Energy at Stanford University. He received his B.S. in Applied Physics, M.S. and Ph.D. (2010) in Materials Science from Caltech. Prior to joining Stanford in 2012, he was a Distinguished Truman Fellow at Sandia National Laboratories. Prof. Chueh has received numerous honors, including the Solid State Ionics Young Scientist Award (2013), Caltech Demetriades-Tsafka-Kokkalis Prize in Energy (2012), and the American Ceramics Society Diamond Award (2008). In 2012, he was named as one of the “top 35 innovators under the age of 35” by MIT’s Technology Review.