

**SEMINARS IN
CHEMICAL AND BIOMOLECULAR ENGINEERING****Wednesday, February 10, 2016 2:00PM****Engineering V → 2101**

Presented by

Dr. Xianwen MaoPostdoctoral Associate, Department of Chemical Engineering
Massachusetts Institute of Technology***“Rational Design of Functional Electrochemical Interfaces”***

Highly efficient electrochemical interfaces are promising to offer solutions to many of mankind’s greatest challenges such as wastewater management, development of renewable energy technologies, prevention and treatment of diseases. Rational design of an electrochemical interface for a specific application requires careful consideration of three key components that constitute such an interface: the electrode, a redox-active foreign material that imparts specific functions, and the electrolyte. In this talk, two material systems will be highlighted: carbon-based electrodes with tunable electronic structure, and electroactive polymers that exhibit distinct properties at different redox states. My study focuses on the identification of the critical factors that govern the efficiencies of electron transfer and charge storage, and the development of electrochemically responsive systems that offer precise control over important catalytic and separation processes.

***Xianwen Mao** obtained his B.S. degree in Polymer Science and Engineering from Tsinghua University, China. He then came to Massachusetts Institute of Technology in September 2008 to pursue his graduate study in Chemical Engineering, working on the design of carbon materials and electroactive polymers for sensing, catalysis, and energy storage applications. He is currently working as a postdoctoral associate in the groups of Professor T. Alan Hatton and Professor Gregory C. Rutledge at the Department of Chemical Engineering, Massachusetts Institute of Technology. His current research interests focus on the development of electrochemical modulation strategies that offer precise control over catalytic and transport processes for applications related to energy, healthcare and the environment.*