



MATERIAL SEMINAR

Toward Understanding Mechanisms in Electrocatalytic Syntheses with Renewable Feedstocks

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Host: Prof. Kyoung-Shin Choi

Electrochemical reactions involve direct conversion between electrical energy and the energy of chemical bonds. While storage and harvesting of electricity are a common goal, electrochemistry also provides a unique platform for performing oxidation and reduction reactions with product distributions and conversion efficiencies that can differ favorably in comparison to analogous thermochemical routes. Such processing has particular appeal for distributed-scale applications, such as utilizing diffuse renewable electricity sources to upgrade biomass-derived intermediates to fuels, chemicals, and materials.

Our recent work on electrochemical upgrading of biomass-derived small molecules into various chemical commodities will be discussed, with a focus on advanced analytical approaches. These include combining online electrochemical mass spectrometry (OLEMS) and in-situ attenuated total reflectance surface-enhanced infrared absorption spectroscopy (ATR-SEIRAS) to understand aspects of the elementary chemical mechanisms that occur. Further discussion will center on a theoretical analysis and perspective on the transition from these exploratory chemistries on common metallic electrodes toward design of more active and product-selective multicomponent electrocatalysts.

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TIME: 12:05 PM – 1435 Learning Studio, North Tower

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