HIGHLANDS IN CHEMISTRY SEMINAR SERIES

JEFF BYERS

BOSTON COLLEGE

"Capitalizing on Redox-Switching and Host-Guest Interactions in Catalysis"

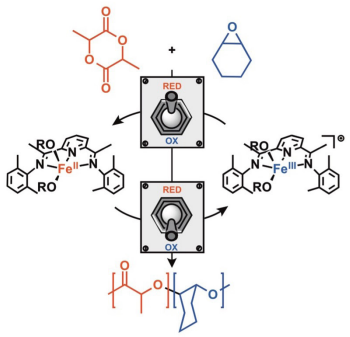
SEPTEMBER 3, 2021

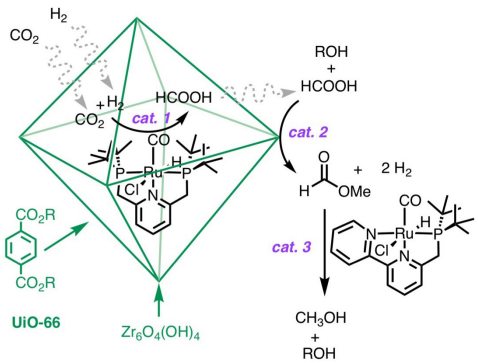
2:30PM ET

HAHN HALL NORTH 140

FACULTY HOST:
JOHN MATSON

Catalytic reactions are often dictated by a series of fundamental transformations that benefit from reactive intermediates that are difficult to form in the absence of the catalyst. Modifications to catalyst identity through systematic changes in their structure has been the predominating paradigm to improve catalytic performance. In this talk, two underutilized alternatives will be described to alter the course of a catalytic reaction and to improve catalytic performance. First, polymerization reactions will be described that take advantage of in situ redox-switches that alter the chemoselectivity of the catalyst for ring-opening polymerization reactions. Such switches can be used to synthesize block copolymers, cross-linked polymers, and in surface initiated polymerization reactions. Second, a strategy for carrying out catalysis using transition metal complexes encapsulated in metal-organic frameworks will be outlined. These host-guest catalysts can be used to carry out carbon dioxide hydrogenation reactions for the formation of useful fuels, such as formic acid and methanol. The simplicity of constructing the host-guest system will be highlighted with the development of tandem catalytic reactions and reactions that benefit from installation of second-sphere interactions that improve catalytic performance.





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