Detroit ECS Student Chapter:
Trailblazers in Electrochemistry
(Vision 2020)

Thursday, October 29th, 2020 @ 2:30 pm ET

Toward Mechanistic Understanding in Electrocatalytic Syntheses with Renewable Feedstocks

Prof. Adam Holewinski
Department of Chemical and Biological Engineering
University of Colorado, Boulder, CO, 80303

Electrochemical reactions involve direct conversion between electrical energy and the energy of chemical bonds. While storage and harvesting of electricity are the most 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 in distributed-scale conversion, such as for biomass-derived intermediates.

Our recent work on electrochemical upgrading of biomass-derived small molecules into feedstocks for commodity and specialty chemicals will be discussed, with a focus on novel analytical approaches. These include combining online electrochemical mass spectrometry (OLEMS) and in situ attenuated total reflectance-surface-enhanced infrared reflection-absorption spectroscopy (ATR-SEIRAS) to understand aspects of the elementary chemical mechanisms that occur. Further discussion will center on a kinetic modeling analysis and perspective on the transition from exploratory chemistry on common metallic electrocatalysts toward design of more active and product-selective multicomponent catalysts. Possible fundamental limits on so-called “bifunctional” catalysts will be discussed.

President: Ruchiranga Ranaweera
Fourth Year Graduate Student
Luo Lab
Department of Chemistry
Wayne State University
Detroit, MI, 48202
trranaweera@wayne.edu

Vice President: Samji Samira
Fifth Year Graduate Student
Nikolla Lab
Department of Chemical Engineering
Wayne State University
Detroit, MI, 48202
ssamira@wayne.edu

Treasurer: Chaturanga Hewa
Fourth Year Graduate Student
Luo Lab
Department of Chemistry
Wayne State University
Detroit, MI, 48202
hewa@wayne.edu

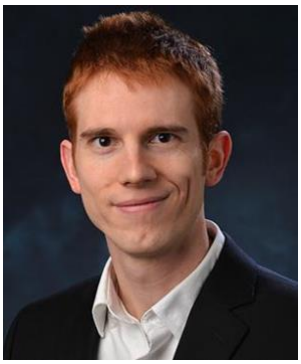
Detroit ECS Student Chapter:

Trailblazers in Electrochemistry

(Vision 2020)

Thursday, October 29th, 2020 @ 2:30 pm ET

Professor Adam Holewinski



Biography: Adam Holewinski is an Assistant Professor of Chemical and Biological Engineering at the University of Colorado–Boulder, and a Fellow of the CU-NREL Renewable and Sustainable Energy Institute. His research interests lie in heterogeneous catalysis and electrochemistry for sustainable production of energy and chemicals, with emphasis on characterization through kinetics, spectroscopy, and computational modeling. Prior to CU, he obtained a Ph.D. at the University of Michigan in 2013, followed by a postdoctoral fellowship at Georgia Tech until 2015. He is an NSF CAREER award recipient and was recently selected to the Industrial and Engineering Chemistry Research 2020 Class of Influential Researchers.

President: Ruchiranga Ranaweera
Fourth Year Graduate Student
Luo Lab
Department of Chemistry
Wayne State University
Detroit, MI, 48202
trranaweera@wayne.edu

Vice President: Samji Samira
Fifth Year Graduate Student
Nikolla Lab
Department of Chemical Engineering
Wayne State University
Detroit, MI, 48202
ssamira@wayne.edu

Treasurer: Chaturanga Hewa
Fourth Year Graduate Student
Luo Lab
Department of Chemistry
Wayne State University
Detroit, MI, 48202
hewa@wayne.edu