

CHEMICAL, BIOLOGICAL & MATERIALS ENGINEERING

100 E. Boyd, Sarkeys Energy Center, T-301

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The University of Oklahoma

Norman, Oklahoma

PHILLIPS 66 SEMINAR SERIES, 2016 – 2017

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CHEMICAL AND BIOLOGICAL ENGINEERING
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AMES, IOWA

Our seminar

“DESIGNING HETEROGENEOUS CATALYSTS FOR THE SELECTION CONVERSION OF BIOMASS IN THE LIQUID PHASE”

The sustainable production of renewable commodity and specialty chemicals largely depends on the conversion of biomass-derived carbohydrates in the condensed phase. These reactions generate new constraints during catalyst design. Notably, hydrothermal stability and resistance to impurities are critical factors for future implementation in industrial processes. In the first part of the presentation, we show that typical oxide catalysts and catalyst supports undergo phase transitions and partial dissolution in water above 100 °C. New catalysts are therefore needed for the hydrothermal conversion of biomass-derived carbohydrates. Functional carbon materials synthesized using simple organic chemistry techniques hold significant promises to address this issue.

Biogenic impurities represent another important cause of catalyst deactivation. Recently, integrated processes that combine biological and chemical catalysts have emerged for the synthesis of complex bio-based molecules. In this approach, metabolically engineered microorganisms selectively convert glucose to a platform intermediate which is further diversified using chemical catalysts. Currently, complex and costly separation steps are required to isolate the intermediate from the fermentation broth and prevent irreversible catalyst poisoning. In the second part of the presentation, we show that electrocatalysis offers new routes to process fermentation broths directly, in the presence of all the impurities.

THURSDAY, NOVEMBER 3, 2016
COOKIES AND COFFEE -- 1:30 P.M.
SEMINAR -- 1:45 P.M.
SARKEYS ENERGY CENTER, M-204

THIS IS A REQUIRED SEMINAR FOR CHE 5971

Accommodations on the basis of disability are available by contacting the office.