

BOUNDARY-SPANNING SEMINAR SERIES

The road to improving experimental understanding with statistical modeling

Seminar by Dr. Stephanie Wettstein
Montana State University



Abstract: New initiatives for reducing adverse environmental impacts in chemical and fuel manufacturing open the door for the development of novel refining strategies using renewable feedstocks. The use of organic solvents for xylose dehydration reactions has recently gained interest due to faster reaction rates and the higher furfural yields obtained, but solvent selection has been mainly “guess-and-check” versus a systematic selection. This presentation focuses on the experimental work that found correlations between the reaction severity and solvent polarity to both xylose conversion and furfural yield. Using principal component analysis and projection to latent structures (PLS), a semi-empirical model was developed that provided estimates of

xylose conversion and furfural yield over a range of experimental reaction severity and solvent polarity values. Additionally, an Artificial Neural Network was created that confirmed the results of the PLS findings. This presentation will also discuss how networking and mentoring led to this collaboration.

Bio: Stephanie Wettstein is an Associate Professor in MSU’s Chemical and Biological Engineering department where she joined in 2012. Her research focuses on synthesizing platform chemicals, specialty chemicals, and biofuels from lignocellulosic biomass using novel catalytic and separation processes. She received her B.S. in Paper Science at the University of Wisconsin

– Stevens Point and worked as a Process Engineer for three years at Kimberly-Clark after graduation. Dr. Wettstein then obtained her Ph.D. from the University of Colorado in the area of zeolite membrane separations under Profs. Falconer and Noble and then completed a two-year post-doc at the University of Wisconsin – Madison in the area of catalysis under the guidance of Prof. Dumesic.

Seminar overview: this seminar series nurtures learning across academic boundaries. Expect rich conversations, spanning machine learning to catalysts, from lab bench to smokestack, with an eye toward protecting nature. Sponsoring units include: KU’s Center for Environmentally Beneficial Catalysis (CEBC), the Internet of Catalysis National Science Foundation Research Traineeship (NRT), Information and Telecommunication Technology Center (ITTC), and the Departments of Chemistry, Chemical and Petroleum Engineering, and Electrical Engineering and Computer Science.

You belong here! We invite everyone from the KU community to join us for this inclusive seminar.

9:00 a.m.
Tuesday
October 19, 2021

Join us by Zoom:

[https://kansas.zoom.us/j/93](https://kansas.zoom.us/j/93403833438)

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