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The CATALYSIS SOCIETY of Metropolitan New York
www.nycsweb.org

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(732) 205-5173
Lucas.Dorazio@basf.com

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ZHONG HE
(908) 281-6000 (x131)
zhe@primusge.com

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(908) 730-2932
(262) 313-4051 (FAX)
John.f.brody@exxonmobil.com

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(631) 632-8433
taejin.kim@stonybrook.edu

Student Representative
CHRISTOPHER KETURAKIS
(610) 758-5149
cjk209@lehigh.edu

Wednesday, February 19, 2014
Somerset-Bridgewater Hotel, Somerset, New Jersey
(Formerly Crowne Plaza Hotel)

Paul J. Dauenhauer
Department of Chemical Engineering
University of Massachusetts Amherst
Amherst, MA 01003 USA
Email: dauenhauer@ecs.umass.edu

Renewable Aromatic Chemicals by Diels-Alder Cycloaddition of Biomass-Derived Furans

With a focus on production of chemicals including p-xylene, we demonstrate new technology to convert sugars derived from cellulose to furans and eventually six-carbon aromatic chemicals. Combination of a zeolite catalyst with favorable reactor conditions results in a new process capable of achieving 90% selectivity to p-xylene from dimethylfuran and ethylene by Diels-Alder cycloaddition. This step completes the entire process of (a) glucose dehydration to hydroxymethylfurfural (HMF), (b) reduction of HMF to dimethylfuran, and (c) cycloaddition/dehydration of DMF to p-xylene. The DMF/ethylene reaction proceeds via two steps: a symmetry-allowed [4+2] Diels-Alder cycloaddition of DMF and ethylene to produce an oxa-norborene cycloadduct intermediate, and subsequent dehydration of the intermediate to form p-xylene. In this work, the kinetics of the combined cycloaddition/dehydration chemistry was experimentally evaluated, and the rate-limiting phenomena were identified. The apparent activation energy for the formation of Diels-Alder products from DMF and ethylene was experimentally measured as 17 ± 3 kcal/mole using DMF in heptane with an H-Y catalyst in the temperature range of 200-250 °C. Research also focused on characterizing the effects of catalyst loading and determining reaction orders with respect to DMF, ethylene and p-xylene.

Dinner is a buffet, and includes <u>a choice of beef, chicken or fish</u>		Members	\$40
		Non-members	\$50
Social Hour (Cash Bar)	6:00 PM	Students	\$25 (Student Members = \$10)
Dinner	7:00 PM	Retired/Post-Doc/ Unemp.	\$40 (Members = \$30)
Presentation	7:45 PM	Annual Dues	\$35 (Student/Retired = \$15)

Deadline for dinner reservations is **2:00 p.m. Friday, February 14, 2014**

Email Zhong He (zhe@primusge.com) for reservations. With the exception of extreme circumstances, anyone not canceling reservations by the above deadline will be billed for dinner regardless of attendance.

2013-2014 Officers: Lucas Dorazio (Chair), Xiaoming Wang (Chair-Elect), Simon Podkolzin (Past Chair), Israel Wachs (Catalysis Society Rep), Zhong He (Secretary), John Brody (Treasurer), Robert McGuire (Webmaster), John Byrne, Marco Castadi, Partha Nandi (Directors), Taejin Kim (Director-Membership), Christopher Keturakis (Student Representative)