



MATERIALS & SURFACE SCIENCE INSTITUTE
RESEARCH FORUM 2010
IN CONJUNCTION WITH THE CHARLES PARSONS INITIATIVE

PRESENTATION BY

Dr. Dmitri Bulushev
MSSI and Charles Parsons Initiative

TITLE OF PRESENTATION

Formic Acid Derived from Biomass as a Source of Hydrogen for Vapour-Phase Catalytic Reactions

ABSTRACT

Formic acid (FA) is a by-product of some “second generation” biorefineries. Hydrogen production from FA and the direct catalytic hydrogenation of olefins by FA have been studied. Pd/C catalysts with the average Pd particle size of less than 10 nm showed good catalytic properties, giving complete conversion of FA at temperatures lower than 423 K, with 95-97% selectivity to hydrogen. FA hydrogenated ethylene and propylene effectively over these catalysts, thus eliminating the need for a separate step of H₂ production. As compared to the Pd catalysts, Au/C and Au/TiO₂ catalysts were found to be less active; neither hydrogenated the olefins. Effect of products on the FA decomposition has been also investigated.

ABOUT THE PRESENTER

Dmitri Bulushev has got his PhD degree from the Boreskov Institute of Catalysis (Novosibirsk, Russia) in 1991. Before entering UL in August 2008 he was working as a chemical engineer at the Swiss Institute of Technology (EPFL, Lausanne) for a number of years. Dmitri is currently a Senior Research Fellow at UL supported by Charles Parsons Initiative and Science Foundation of Ireland. Recently he was elected as an MSSI member. He is a co-author of about 45 peer reviewed articles and a referee for different catalytic, chemical engineering and physical chemistry journals. His main field of research is catalysis. Dmitri elucidated factors determining activity and selectivity of different catalysts using transient kinetics, adsorption, temperature-programmed, isotopic, “in situ” spectroscopic and catalysts characterization methods. At present, he is involved in a research on catalytic conversion of intermediates derived from biomass to valuable chemicals.

DATE: Thursday, 4 February 2009
TIME: 12h00
VENUE: MSB-012 MSSI Building

REFRESHMENTS WILL BE PROVIDED AT 11h45

For further information, please contact:

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