



Catalytic Conversion of Concentrated Feed of Sugars to Specialty Chemicals

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ABSTRACT

Although there is a plethora of articles published daily on the catalytic conversion of carbohydrates to chemicals and fuels, in many cases, process productivities remain unacceptable for a deployment at an industrial scale. In this field, catalysis is facing important scientific hurdles such as deactivation of catalysts, utilization of diluted feed of carbohydrates, selectivity issues, etc.

Starting with the Fischer catalytic glycosylation of glucose with fatty alcohols as a case in point, we will show that recently developed perfluorinated sulfonic polymers (Aquivion PFSA) are capable of producing alkylglycosides from highly concentrated feeds of glucose. Importantly, Aquivion PFSA even surpasses the performances of sulfuric acid (commonly used in industry) in terms of selectivity and productivity. Conversely to H_2SO_4 , over Aquivion PFSA, alkylglycosides were successfully obtained from low value sugar feeds such as glucose syrup and cellulosic waste. A life cycle assessment of the whole process revealed that the environmental impact of this heterogeneously-catalyzed pathway was even lower than the industrial one, in particular thanks to the utilization of cellulosic waste (*vs* corn-derived refined sugar in industrialized processes).

On the continuation of our works on glycosylation reactions, we will discuss the possibility to activate the anomeric position of monomeric sugars and cellulosic waste using alternative activation methods such as atmospheric plasma and high frequency ultrasounds. In some cases, these technologies permit the processing of sugars without any solvent or catalyst. In particular, high value oligosaccharides were obtained. The potentialities and limitations of these emerging activation technologies will be discussed.

Date: 27 October 2017 (Friday)

Time: 11:00 a.m. – 12:00 noon

Venue: Room ZS970, 9/F, Block Z,
The Hong Kong Polytechnic University,
181 Chatham Road South,
Hung Hom, Kowloon

SPEAKER'S BIOGRAPHY

François JEROME received his Ph.D. degree in chemistry from the University of Burgundy (France) in 2000 under the supervision of Prof. R. Guillard. Then, he moved as a Postdoc to the University of California of Davis (USA) in the group of Prof. K. M. Smith followed by a second postdoctoral position at the University of Rennes 1 under the guidance of Prof. P. H. Dixneuf where he worked on homogeneous catalysis. In 2002, he joined the CNRS as a permanent researcher in the Laboratoire de Catalyse en Chimie Organique at the University of Poitiers.

In 2010, his researches on catalysis have been awarded by the French division of catalysis. In 2011, he was promoted as a CNRS research director at the Institut de Chimie des Milieux et Matériaux de Poitiers. In 2015, he created the research federation INCREASE, hosted by the CNRS, gathering scientists from academia working together with chemical companies on the catalytic conversion of renewable feedstocks to specialty chemicals. He is also the chairman of the International Symposium on Green Chemistry (organized at La Rochelle in 2013, 2015 and 2017), member of the advisory board of Green Chemistry and member of the executive committee of the French division of catalysis.

*** All Interested Are Welcome ***

For further information, please contact Dr. Dan Tsang at Tel. 2766-6072.

Free admission. Certificates of attendance will be provided to registered participants if they attend the whole lecture.