SEMINAR SERIES

International Institute for Carbon-Neutral Energy Research
Kyushu University

Title Catalysis: A Key Technology for Sustainable Chemistry and Energy Technologies

Speaker Prof. Matthias Beller

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Date & Time Thursday, January 9, 2014 3:00 p.m.

Place I²CNER Hall, Ito campus, Kyushu University

Abstract

Despite numerous important methodological advancements in all areas of chemistry, still most organic synthesis as well as the industrial production of chemicals can be improved. Currently, more than 80% of all products of the chemical industry are made via catalysis. In this regard, the development of new and more efficient catalysts constitutes a key factor for achieving a sustainable production of all kinds of chemicals today and in the future. Here, several major challenges will be presented in the talk; e.g. the use of mixtures for the synthesis of bulk chemicals. Furthermore, it will be shown that recently developed molecular-defined as well as nano-structured cobalt and iron catalysts enable us to perform catalytic hydrogenation processes with high yields and unprecedented selectivity. Specific examples which demonstrate the potential of catalytic processes with bio-relevant metal complexes compared to more traditional catalytic reactions will include hydrogenations and dehydrogenations as well as applications in the energy sector. In the future, also for industrial processes improved economics based on the presented novel catalysts might be expected.

Keywords: Catalysis, Energy, Sustainable Synthesis.

Selected relevant references

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About the Speaker

Prof. Matthias Beller, born 1962 in Gudensberg, studied chemistry at the University of Göttingen, Germany, where he completed his PhD thesis in 1989 in the group of L.-F. Tietze. As recipient of a Liebig scholarship, he then spent a one-year with K. B. Sharpless at MIT, USA. From 1991 to 1995, Beller worked in industry. Then, he moved to the Technical University of München as Professor for Inorganic Chemistry. In 1998, he relocated to Rostock to head the Institute for Organic Catalysis, which became in 2006 the Leibniz-Institute for Catalysis. The work of his group was published in >600 original publications, reviews and >90 patent applications have been filed in the last decade. He has received several awards including the Otto-Roelen Medal and the Leibniz-Price of the DFG. In 2006, he was also awarded “Entrepreneur of the Year” of Rostock and he received the German Federal Cross of Merit. He received the first “European price for Sustainable Chemistry”, the “Paul-Rylander Award” of the Organic Reaction Catalysis Society of the USA and the Gay-Lussac-Alexander-von-Humboldt-Prize of the French Academy of Sciences. He is head of the German Chemical Society working group “Sustainable Chemistry” and a member of three German Academies of Sciences including the German National Academia “Leopoldina”. He is married to Dr. Anja Fischer-Beller and they have two sons.

Host: Professor Ken Sakai

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