

UniCat Colloquium

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Homogeneous Activation of Dihydrogen with Cu Catalysts: Towards Atom-Economic and Sustainable C-C Bond Formation Reactions

Research in the Teichert lab aims at the replacement of stoichiometric metal-based reducing agents in carbon-carbon bond formation reactions with cheap and atom-economic dihydrogen gas. At the same time, the research is directed towards the use of readily-available first row transition metals. The focus of this approach is twofold: Understanding the mechanisms of transition metal-based dihydrogen activation and application in new and useful synthetic transformations.

Our current efforts revolve around the employment of homogeneous Cu complexes for the catalytic generation of Cu hydrides from dihydrogen gas. These compounds are known to react smoothly with alkynes to generate vinylcopper compounds. We are interested in using the latter as vinyl anion synthons for follow-up C-C bond forming reactions. Classically, vinyl anion synthons are generated from the corresponding halogen precursors with a stoichiometric amount of metal such as Mg or Li. Cu hydrides are generated from suitable Cu precursors and a silane as reducing agent. Both processes generate stoichiometric amounts of waste (metal and/or silane byproducts), which we are trying to avoid by replacing the reducing agents with dihydrogen, rendering the resulting process a sustainable transformation.

The catalytically generated vinylcopper complexes can be used in a variety of downstream transformations, such as 1,2- and 1,4-addition, allylic substitution or cross-coupling reactions, displaying their utility as versatile building blocks. To study the dihydrogen activation, our research is focused on the development of new alkoxide-tethered ligands which allow for a cooperative dihydrogen activation. At the same time, these complexes are ideally set up for the detailed study of the activation mechanism itself.

Wednesday, October 15, 2014 at 5:15 PM

TU Berlin, Institute of Chemistry
Straße des 17. Juni 115, 10623 Berlin

Building C, Lecture Hall **C 264**

Prof. Oestreich (TUB)

Organizer

Coffee and cake will be served 30 minutes before the lecture. Guests are cordially invited to attend!
Prof. Dr. Matthias Driess - Chair of the Cluster of Excellence UniCat - www.unicat.tu-berlin.de



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