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Unifying Concepts in Catalysis

Special Colloquium

TU Berlin, Division of Organic Chemistry in collaboration with UniCat

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Lecturer: **Prof. Charles P. Casey**, Dept. of Chemistry, University of Wisconsin, Madison, USA

Title: **An Efficient and Chemoselective Iron Catalyst for the Hydrogenation of Ketones**

Abstract: Mechanistic studies of the Shvo diruthenium catalyst showed that the active reducing agent, a monoruthenium complex, was in equilibrium with the major species, an inactive bridging hydride. We searched for sterically crowded Cp ligand systems that would destabilize the bimetallic system. In the course of these studies, we found that iron catalysts had similar reactivity to the ruthenium catalysts. These iron complexes which have electronically coupled acidic and hydridic hydrogens catalyze the reduction of ketones under mild conditions. They show high chemoselectivity for reduction of aldehydes, ketones, and imines; isolated C=C, C-X, $-NO_2$, epoxides, and esters are not reduced.
Iron alcohol complexes are intermediates in the hydrogenation and have been isolated and characterized. Mechanistic studies of ketone hydrogenation have shown that the iron hydride is the resting state and that reduction of the ketone is rate limiting. In contrast, an iron-alcohol complex is the resting state for aldehyde hydrogenation and reaction of H_2 with the alcohol complex is rate limiting.

Date: **Monday, 16 November 2009**

Time: **5:15 pm - around 6:45 pm**

Location: **TU Berlin**
Institute of Chemistry, Building C
Straße des 17. Juni 115, 10623 Berlin
room C 243

Organiser: Prof. Dr. H. Schwarz (TUB)

Coffee and tea will be served thirty minutes prior to the lecture start.
Guests are cordially invited to attend!

Prof. Dr. Matthias Driess, Chair of the Cluster of Excellence UniCat