

UniCat Colloquium

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A Rational Preparation of Single and Bi-Metal Supported Catalysts

Our group's efforts have been directed toward "the transformation of the art of catalyst preparation into a science." To this end, we have been conducting fundamental studies of catalyst impregnation, the process whereby solutions containing atomically dispersed metal precursors are contacted with high surface area supports. The goal of the synthesis is to create a catalyst with the highest amount of stable active sites: small metal particles firmly anchored to the support. In the case of bimetallic catalysts, in addition to high metal dispersion the additional goal is intimate contact of the two metals.

The adsorption of noble metal coordination complexes such as platinum hexachloride, $[\text{PtCl}_6]^{2-}$, and platinum tetraammine, $[(\text{NH}_3)_4\text{Pt}]^{2+}$, over many oxides and carbon surfaces can be explained by a relatively simple electrostatic model. Oxide and oxygenated carbon surfaces terminate in hydroxyl groups, which can become protonated and positively charged at low pH and deprotonated and so negatively charged at high pH, relative to the characteristic pH of point of zero charge (PZC) of a material.

In this talk, it will be demonstrated that "strong electrostatic adsorption" (SEA) of many noble and base metal cationic and anionic complexes occurs over a wide variety of oxide and carbon supports, and after reduction, this synthesis strategy yields small, well dispersed metal particles.

Applications of the SEA method for selective metal partitioning over mixed oxide supports such as promoted or bound catalysts and for homogeneously alloyed or core-shell bimetallic catalysts will also be demonstrated.

Wednesday, October 29, 2014 at 5:15 PM

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

Building C, Lecture Hall **C 264**

Dr. Krähnert (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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