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Unifying Concepts in Catalysis

UniCat Colloquium

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Heavier Low-valent Group 14 Compounds: Alternatives for Carbenes and Phosphines as Transition Metal Ligands

Transition metal catalysts make possible an enormous amount of selective and atom-economical transformations and are being used in almost every field of chemistry, and their applications in industry are on the increase, even at the production level. Traditionally, phosphines were used, later, the successful application of carbenes, especially N-heterocyclic carbenes (NHC), broadened the list of potential transition metal ligands. This raises the question whether heavier low-valent group 14 compounds, such as silylenes and germylenes, can be used for the same purpose.

Thus, we gathered all synthesized low-valent silicon and germanium compounds and investigate them with quantum chemical methods for their possible effects on the catalytic activity of transition metals catalysis. In this lecture, I will show that heavier low-valent group 14 compounds can provide even better results compared to regularly applied phosphines and carbenes in all considered features that can influence the reaction rate: σ-donating and π-accepting abilities, ligand-to-metal charge transfer (LMCT), and steric properties. I will also show the principles behind the enhanced properties and how to design even better heavier low-valent group 14 ligands with the small modification of known compounds.

Wednesday, November 05, 2014 at 5:15 PM

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

Building C, Lecture Hall **C 264**

Prof. Driess (TUB)
Organizer

Coffee and cake will be served 30 minutes before the lecture. Guests are cordially invited to attend!