

UniCat Colloquium

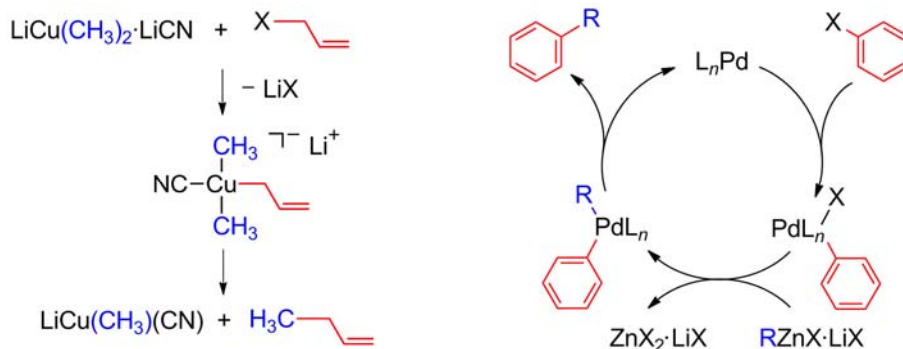
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Lecturer: **Prof. Konrad Koszinowski**, Institut für Organische und Biomolekulare Chemie, Georg-August-Universität Göttingen, Germany

Title: **Intermediates of Transition-Metal Mediated Cross-Coupling Reactions**

Abstract: Transition-metal mediated cross-coupling reactions are among the most useful transformations in organic synthesis. Despite their importance and despite extensive investigations, the mechanisms of many cross-coupling reactions remain poorly understood to date and, thus, do not permit the rational optimization of reagents and catalysts. In particular, the intermediates of these multi-step reactions need to be identified and characterized.

To this end, we employ a combination of electrospray-ionization mass spectrometry, electrical conductivity measurements, and NMR as well as UV/vis spectroscopy. In addition, kinetic measurements in the gas or the condensed phase provide further information on the reactivity of the probed systems. Our present activities center on two reaction types (Scheme 1): (i) cross-coupling of organocuprates and alkyl halides, and (ii) Pd-catalyzed Negishi cross-coupling reactions. For the former, we not only observe the in-situ formed organocuprate(I) aggregates,^[1] but also the elusive Cu(III) intermediates and determine their unimolecular reactivity.^[2] In the case of the Negishi cross-coupling reactions,^[3] we focus on the rate-increasing effect of lithium halide additives.^[4] Here, the simultaneous presence of Pd, Zn, and Li species gives rise to an enormous level of complexity.



Scheme 1: Cu- and Pd-mediated cross-coupling reactions investigated.

[1] A. Putau, K. Koszinowski, *Organometallics* **2011**, *30*, 4771-4778.

[2] A. Putau, H. Brand, K. Koszinowski, *J. Am. Chem. Soc.* **2012**, *134*, 613-622.

[3] M. A. Schade, J. E. Fleckenstein, P. Knochel, K. Koszinowski, *J. Org. Chem.* **2010**, *75*, 6848-6857.

[4] J. E. Fleckenstein, K. Koszinowski, *Organometallics* **2011**, *30*, 5018-5026.

Date: **Wednesday, March 6, 2013 at 5:15 pm**

Location: **TU Berlin, Department of Chemistry
Straße des 17. Juni 115, 10623 Berlin
Building C, Lecture Hall C 264**

Organiser: **Prof. Helmut 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