• PERSONAL INFORMATION

Family name, First name: Kretschmer, Robert

Research ID: I-5523-2015; orcid.org/0000-0002-7731-3748

Publications (journals): 29; Citations 235; Citations / article 8.4; H Index 8

Publications (book chapters): 1

Patents: 2

Nationality: German

Date of birth: 07.02.1984

URL for web site: http://www.ur.de/chemie-pharmazie/anorganische-chemie-kretschmer/index.html

• EDUCATION

2012	Dr. rer. nat. (Ph.D.) in Chemistry, Technical University Berlin, Germany
2010	Diplom (M.Sc.), Friedrich-Schiller-University Jena, Germany
2004	National craft certificate, qualified chemical laboratory worker, Schering AG Berlin, Germany

• CURRENT POSITION(S)

2015 - today	Research group leader (Habilitand), University of Regensburg, Germany

• PREVIOUS POSITIONS

2013 - 2014	Postdoctoral Fellow, Technical University Berlin, Germany
2012 - 2013	Postdoctoral Fellow (with Guy Bertrand), University of California at San Diego, USA
2012	Postdoctoral Fellow (with Helmut Schwarz), Technical University Berlin, Germany
2006 - 2007	Qualified chemical laboratory worker, Wacker Biotech GmbH, Jena, Germany
2004 - 2006	Qualified chemical laboratory worker, ALTANA Pharma AG, Konstanz, Germany

• FELLOWSHIPS AND AWARDS

2014 - today	Liebig Fellowship, Fonds der Chemischen Industrie
2013 - 2014	Feodor-Lynen-Comeback-Fellowship, Alexander von Humboldt Foundation
2012 - 2013	Feodor-Lynen-Fellowship, Alexander von Humboldt Foundation
2010 - 2012	Kekulé Scholarship, Fonds der Chemischen Industrie
2007 - 2010	Undergraduate Fellow, Hans Böckler Foundation

• TEACHING ACTIVITIES

since 2015	Teaching of “Inorganic Chemistry” for B.Sc. and “Methods in Physical-Inorganic Chemistry” for M.Sc. students at the University of Regensburg
since 2008	Trainer for youth and adult education

• MEMBERSHIPS OF SCIENTIFIC SOCIETIES

German Chemical Society (GDCH)

• RESEARCH PROFILE

(1) One research field of our group focusses on the design and synthesis of low-valent polynuclear Group 13 and 14 compounds. Besides the investigation of structure and bonding in these unique organometallic compounds, we are interested in their application towards small molecule activation and catalysis. Tailored chelating ligands are used to systematically modify the oxidations states of the metals, the metal-metal distances and the electronic interactions between them. The well-directed variation of the cooperativity between the metal(loid) centers may lead to novel and exciting chemistry, beyond the scope of conventional monometallic Group 13 and 14 reagents.

(2) The second aim of our group is the investigation and elucidation of reaction mechanisms and catalytic cycles. By combination of computational chemistry, isotopic labeling studies and high-resolution mass-spectrometry we are investigating chemicals transformations mediated by polynuclear complexes of main-group elements and transition metals, for which the mechanisms are so far only scarcely understood.

Representative publications

1. *Single and Double NH Bond Activation of Ammonia by $[Al_2O_3]^{\bullet+}$: Room Temperature Formation of the Aminyl Radical and Nitrene*; R. Kretschmer, Z.-C. Wang, M. Schlangen, H. Schwarz, *Angew. Chem. Int Ed.* **2013**, *52*, 9513-9517; 10.1002/anie.201302506

2. *Direct Conversion of Methane into Formaldehyde Mediated by $[Al_2O_3]^{\bullet+}$ at Room Temperature*; Z.-C. Wang, N. Dietl, R. Kretschmer, J.B. Ma, T. Weiske, M. Schlangen, H. Schwarz, *Angew. Chem. Int. Ed.* **2012**, *51*, 3703-3707; 10.1002/anie.201200015

Both papers demonstrate the cooperative effects originating from two main-group elements combined in one molecule, which give rise to the conversion of methane to methanol and of ammonia to nitrene. We are using the results originating from these gas-phase studies in our current (condensed-phase) experiments with the aim of reconstructing an Al_2O_2 active site by using ligands possessing two binding sides.

3. *C-N and C-C Bond Formations in the Thermal Reactions of "$Ni(NH_2)^+$ with C_2H_4: Mechanistic Insight on the Metal-Mediated Hydroamination of an Unactivated Olefin;* R. Kretschmer, M. Schlangen, H. Schwarz, *Angew. Chem. Int Ed.* **2012**, *51*, 3483-3488; doi:10.1002/anie.201104433

In this paper we demonstrated that C–N bond formation occurs in the reaction of $Ni(NH_2)^+$ with ethylene. This rather simple example helps to understand the elementary steps of the Nickel-mediated hydroamination of olefins – a very important topic in catalysis.