



Seminarios itinerantes

Christian MÜLLER

Freie Universität Berlin

30 de Septiembre a 12 de Octubre 2016

Recent developments in the chemistry of aromatic phosphorus heterocycles:

From fundamental aspects to applications

Viernes, 30 de Septiembre, Universidad de Alcalá de Henares

12:00 h, Aula de Grados, Facultad de Farmacia (juanc.flores@uah.es)

Lunes, 3 de Octubre, IIQ, CSIC – Universidad de Sevilla

12:00 h, Salón de actos del IIQ (campora@iiq.csic.es)

Miércoles, 5 de Octubre, ISQCH, CSIC – Universidad de Zaragoza

12:00 h, Sala de Grados de la Facultad de Ciencias (sola@unizar.es)

Jueves, 6 de Octubre, Universidad del País Vasco – EHU, S. Sebastián – Donostia

12:00 h, Sala de Actos, Facultad de Química (zoraida_freixa@ehu.es)

Lunes, 10 de Octubre, Universitat Rovira i Virgili, Tarragona

12:00 h, Sala de Grados de la Facultad de Química (carmen.claver@urv.cat)

Miércoles, 12 de Octubre, Université de Toulouse III – Paul Sabatier

14:00 h, Salle P. Maroni, Module de Haute Technologie (gomez@chimie.ups-tlse.fr)

- Esta conferencia forma parte de las actividades formativas del programa “Química Aplicada y Materiales Poliméricos” de la UPV-EHU.

GEQO

Grupo Especializado de Química
Organometálica de la Real Sociedad
Española de Química

RSEQ
Real Sociedad Española de Química
El Sitio de la Química en España

Low-coordinate phosphorus compounds have recently regained noticeable interest as the very peculiar stereoelectronic and coordination properties of such $\lambda^3\sigma^2$ -species differ significantly from classical trivalent $\lambda^3\sigma^3$ -phosphanes. These special characteristics can have interesting effects in applications, such as homogeneous catalysis or material science.

Due to a modular synthetic approach, we have lately demonstrated the access to various donor-functionalized 2,4,6-triaryl- λ^3 -phosphinines (phosphabenzenes, type A, Figure 1), including phosphorus derivatives of 2,2'-bipyridine and terpyridine. By making use of the chelate effect, we could demonstrate for the first time that neutral P,N and anionic P,C hybrid ligands form easily coordination compounds with transition metal centers in both low as well as medium to high oxidation states, which is an important aspect for applications in more applied research fields.

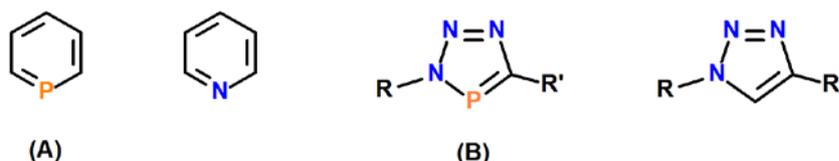


Figure 1. Phosphinine (A) and triazaphosphole (B) and comparison with their nitrogen-analogues.

Inspired by these findings, we started to investigate also other classes of functionalized, low-coordinate phosphorus compounds. We anticipated that derivatives of 3*H*-1,2,3,4-triazaphospholes (type B, figure 2) are suitable candidates, as they can generally be prepared in a modular “click”-reaction, starting from azides and phosphalkynes. First results show indeed, that this powerful tool can be used as well for the straightforward and simple preparation of donor-substituted, chelating triazaphospholes.

This lecture will focus on the design and preparation of especially pyridyl-functionalized phosphinines and triazaphospholes. The access to such compounds provides new perspectives for areas of chemical research, which are otherwise dominated by transition metal complexes based on pyridine-, bipyridine- and terpyridine-based ligands. A detailed comparison of the here-presented low-coordinate phosphorus compounds with their structurally related nitrogen-counterparts, having an identical substitution pattern, will be provided.



Christian MÜLLER was born in Germany in 1972. He studied Chemistry at the University of Bielefeld and the University of Michigan, Ann Arbor (USA) and received his Ph.D. under the supervision of Prof. Dr. P. Jutzi at the University of Bielefeld/Germany in 2000. He was awarded with a fellowship of the Deutsche Forschungsgemeinschaft (DFG) to work with Prof. Dr. W. D. Jones at the University of Rochester, New York (USA) and started in 2002 a second postdoc with Prof. Dr. P. W. N. M. van Leeuwen at the University of Amsterdam, The Netherlands. Afterwards he joined the group of Prof. Dr. D. Vogt at Eindhoven University of Technology in 2003 where he got appointed as Assistant Professor in 2004. In 2008 he received the prestigious Vidi grant from the Netherlands Organization of Scientific Research (NWO) to conduct research in the field of low-coordinate organophosphorus chemistry. In summer 2011 he got nominated to Associate Professor of Inorganic Chemistry and Homogeneous Catalysis at Eindhoven University of Technology, which he refused to accept. Instead he got appointed full Professor of Inorganic Chemistry at the Free University of Berlin, Germany, where

he started in February 2012. His research interests are centered around the subjects “low-coordinate phosphorus and arsenic compounds”, “activation of small molecules”, “functional coordination compounds”, and “homogeneous catalysis”.

Institute of Chemistry and Biochemistry, Freie Universität Berlin, Fabeckstr. 34/36, 14195 Berlin, Germany
 cmueller@fu-berlin.de

<http://www.bcp.fuberlin.de/en/chemie/chemie/forschung/InorgChem/agmueller/index.html>

GEQO

Grupo Especializado de Química
 Organometálica de la Real Sociedad
 Española de Química

RSEQ
 Real Sociedad Española de Química
 El Sitio de la Química en España