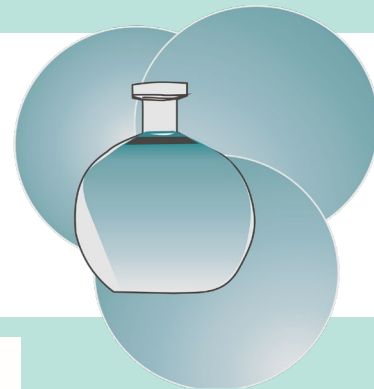


Fakultät für Naturwissenschaften

Institut für Chemie



lädt ein

gemeinsam mit der Gesellschaft
Deutscher Chemiker

zum
Vortrag

von Herrn

**Prof. Dr. Frank
Breher**

*Institute of Inorganic
Chemistry*

***Karlsruhe Institute of
Technology (KIT)***



“New Perspectives for Main Group Organometallics: Frustrated Lewis Pair Chemistry and Photoinitiated Radical Reactivity”

am: 05. Februar 2026

um: 09:30 Uhr

WO: im Raum 1/232

Gäste sind herzlich willkommen!

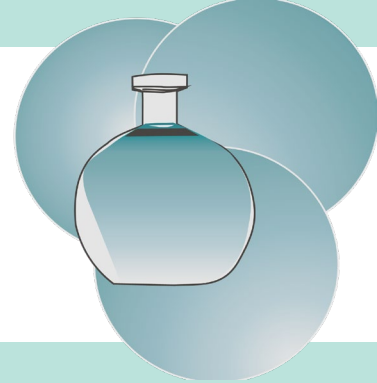


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New Perspectives for Main Group Organometallics: Frustrated Lewis Pair Chemistry and Photoinitiated Radical Reactivity

Since its first report, the use of so-called frustrated Lewis pairs (FLPs), consisting of sterically hindered Lewis acids and Lewis bases to prevent adduct formation in the activation of small molecules, has increased considerably. Notwithstanding these achievements, ambiphilic molecules are promising candidates for splitting highly stable bonds, for example, N–H bonds in NH_3 . B/P-based FLPs have been used for inter- and intramolecular hydroaminations of alkynes with secondary amines. In addition, quantum chemical studies present FLPs as promising candidates in the dehydrogenation of ammonia borane involving N–H bond activation. However, the combination of Al- or Ga-based Lewis acids and carbon-based Lewis base is uncommon in the field of FLP chemistry. In the first part of the talk, we discuss the synthesis of Al/C and Ga/C ambiphiles and their reactivity towards small molecules such as NH_3 .^[1–3]

In the second part, we address the photoinitiated homolysis of M–C bonds within organometallic compounds, which is an important mode of carbon radical formation.^[4] In this respect, the use of earth-abundant main group elements such as aluminum or silicon is attractive. However, these elements form strong E–C bonds, so that short-wave UV radiation is usually required for E–C homolysis, which impedes their use as a radical source. Some reports in the literature show that visible-light-induced E–C homolysis is possible when a redox noninnocent ligand (NIL)^[5] is coordinated to the organometallic fragment. Although the concept is not yet broadly established and needs to be further explored, the key point is that the presence of redox non-innocent ligands allows for homolysis of the E–C bond with wavelengths in the visible-light range.^[6]

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