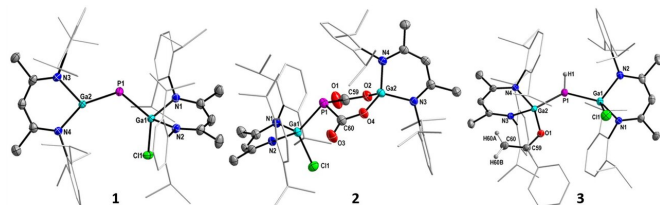


Future options for storing carbon dioxide: Synthesis of inorganic heteroalkenes

14 January 2021



Structures of the gallaphosphene (1) and the complex of CO₂ (2) and acetophenone (3). (c) UDE/S.Schulz

Julia Krüger et al. From ??Bonded Gallapnictenes to Nucleophilic, Redox?Active Metal?Coordinated Pnictanides, *Angewandte Chemie International Edition* (2020). DOI: [10.1002/anie.202013618](https://doi.org/10.1002/anie.202013618)

Stephan Schulz et al. Multi?talented gallaphosphene for Ga–P–Ga heteroallyl cation generation, CO₂ storage and C(sp³)–H bond activation, *Angewandte Chemie International Edition* (2020). DOI: [10.1002/anie.202014381](https://doi.org/10.1002/anie.202014381)

Group 13/15 heteroalkenes RMER' with M–E double bonds (M = B–Tl; E = N–Bi) offer promising potential for bond activation reactions, but they are difficult to prepare. A team led by CENIDE professor Stephan Schulz now describes new synthetic methods for group 13 metallapnictenes in no less than three articles in the journal *Angewandte Chemie*. They allow for the preparation of preparative amounts as a basis for systematic reactivity studies.

It was shown that the gallaphosphene L(CL)Ga=P–GaL (L =?-diketiminato) not only selectively activates the C(sp³)-H bonds of acetone and acetophenone, but also CO₂. The latter reaction is even completely reversible in this process, and thus the bound CO₂ can be re-released with reversion of the gallaphosphene at 90 °C.

"I would never have thought that such a reversible reaction, that reveals new options in CO₂ storage, was possible. Together with CH activation, the supreme discipline in organometallic chemistry, this results in a wide range of options—including catalytic reactions," Schulz says.

More information: Bin Li et al. Synthesis and Reactivity of Heteroleptic Ga?P?C Allyl Cation Analogues, *Angewandte Chemie International Edition* (2020). DOI: [10.1002/anie.202012595](https://doi.org/10.1002/anie.202012595)

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