

## Thermal Decomposition of Mono and Bimetallic Metal Amidoborane Complexes

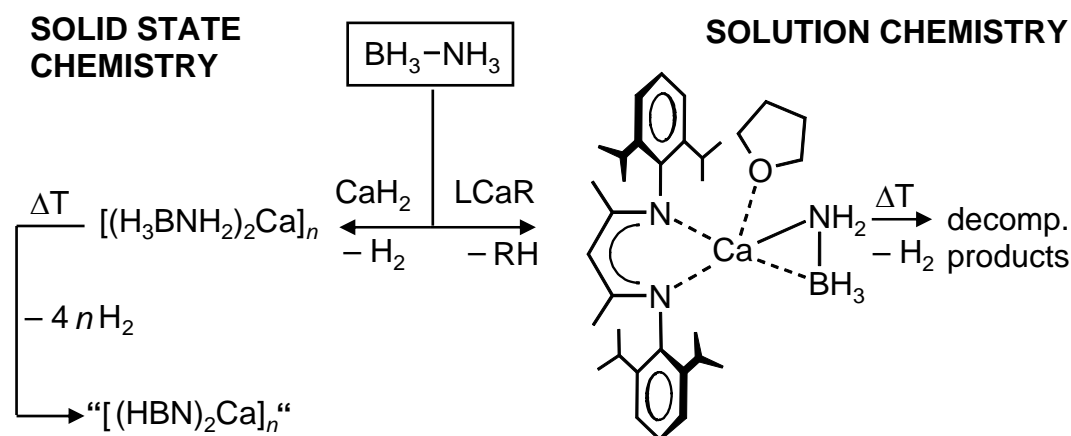
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The search for safe and convenient high-capacity hydrogen storage materials is strongly focusing on ammonia-borane ( $\text{H}_3\text{NBH}_3$ ), a material that contains nearly 20 w% of hydrogen. Recently  $\text{Ca}(\text{NH}_2\text{BH}_3)_2$  has been introduced as a hydrogen storage material.<sup>[1]</sup> Its thermal decomposition differs advantageously from  $\text{NH}_3\text{BH}_3$  and the hydrogen released is not contaminated with undesirable borazine by-products (see figure).

As difficulties in the characterization of intermediates and products are a general problem in solid state chemistry, we investigated this intriguing reaction under homogeneous conditions. Use of a  $\beta$ -diketiminato ligand gave access to hydrocarbon-soluble calcium amidoborane complexes and allowed for a detailed characterization of their thermal decomposition products.<sup>[2, 3]</sup>

Here we present our latest investigations on the influence of the metal on the thermal decomposition behaviour and compare magnesium amidoborane complexes with their calcium analogues.<sup>[4, 5]</sup> In addition bimetallic magnesium amidoborane compounds are introduced that show different decomposition pathways.



Literature:

[1] H. V. K. Diyabalanage, R. P. Shrestha, T. A. Semelsberger, B. L. Scott, M. E. Bowden, B. L. Davis, A. K. Burrell, *Angew. Chem. Int. Ed.* **2007**, *46*, 8995. [2] J. Spielmann, G. Jansen, H. Bandmann, S. Harder, *Angew. Chem. Int. Ed.* **2008**, *47*, 2690. [3] J. Spielmann, S. Harder, *J. Am. Chem. Soc.* **2009**, *131*, 5064. [4] J. Spielmann, M. Bolte, S. Harder, *Chem. Commun.* **2009**, 6934. [5] J. Spielmann, D. F.-J. Piesik, S. Harder, *Chem. Eur. J.* **2010**, *16*, 8307.