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Text:

Human energetic paradigm currently implies getting low oxidation state carbon (fossil oil) to upper states (as CO_2). To move from this linear system to a more sustainable one, renewable carbon sources such as biomass or polymer wastes are good candidates but are often highly oxidized. Therefore, to valorize such substrate, versatile reductants and related methodologies are required. Hydroboranes present suitable electro-redox potential for the carbon-oxygen bonds reduction. A major drawback is the synthesis of such reductants, highly energy consuming. The hydroboranes are synthesized from BH_3,[1] and end as oxygenated wastes after use. Activation of small molecules such as hydrogen is well-known with boron derivative in the Frustrated Lewis Pair (FLP) chemistry[2]. Herein we report the first example of H_2 activation and followed by hydrogenolysis of the B-chloroborane bond to form hydroborane derivatives in quantitative yields. We also found that in our method the chloroborane can act as surrogate for hydroborane given our hydrogenolysis conditions are compatible with hydroboration conditions, allowing domino reactions without hydroborane isolation. Thus, this extend the possible applications of chloroboranes in synthesis. It also paves the way for hydroboranes synthesis from other B-X compounds.

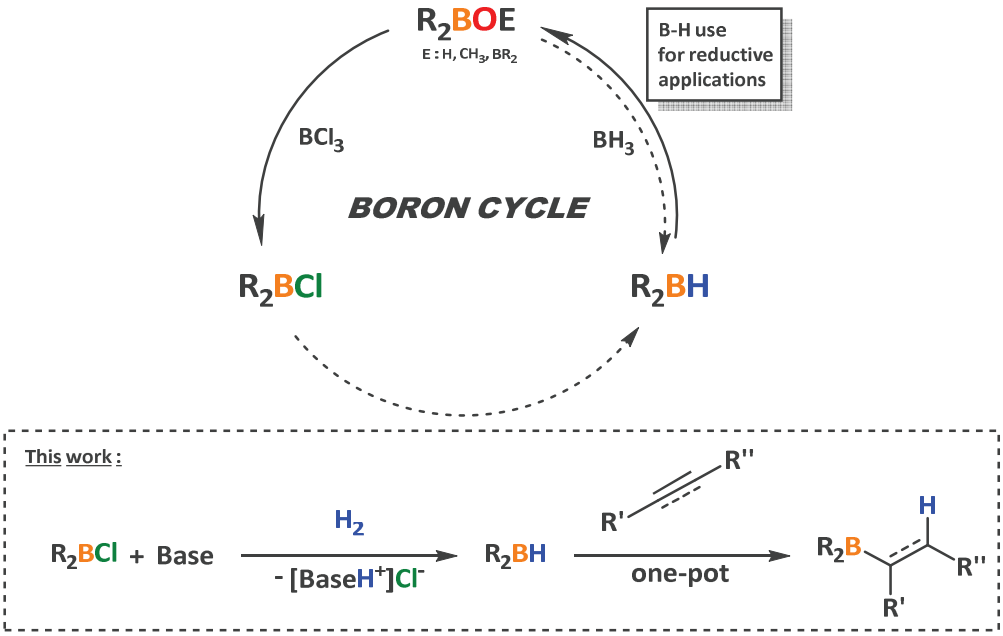

Fig. 1 : Hydrogenolysis of chloroboranes in boranes with an organic base, applications and context

(1) Brown, H. C.; Klender, G. J. *Inorg. Chem.* **1962**, *1* (2), 204–214. https://doi.org/10.1021/ic50002a003.
(2) Ginovska, B.; Autrey, T.; Parab, K.; Bowden, M. E.; Potter, R. G.; Camaioni, D. M. *Chem. – Eur. J.* **2015**, *21* (44), 15713–15719. https://doi.org/10.1002/chem.201501899.