EXPLORING THE ROLE OF BASES IN CARBOXYLATION OF GRIGNARD REAGENTS WITH CO_2

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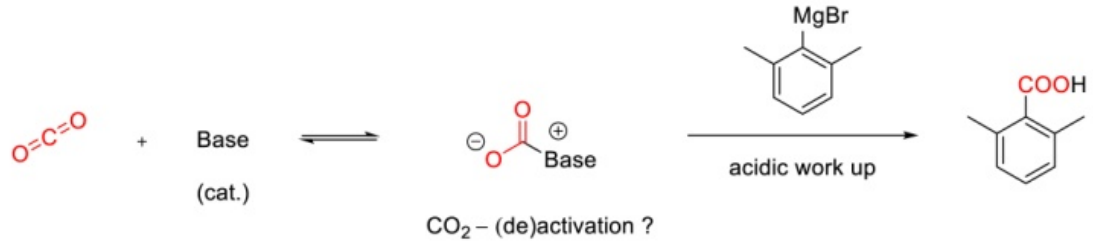
The intrinsic high reduction potential of Grignard reagents allows facile formation of C-CO_2 bond to access carboxylic acids. However, an ideal chemical CO_2-functionalization reaction is yet to be developed because of the high thermodynamic stability and kinetic inertness of CO_2.[1] Therefore, it is desired to develop a CO_2-activation catalyst – which would increase effective concentration of CO_2 in reaction medium, while decreasing LUMO energy of CO_2 to facilitate chemical process. To probe this, we designed a model study: Grignard reaction with carbon dioxide in the presence of basic catalysts, which are prone to interact with CO_2. Although the form of "carbamates" – CO_2 adducts of amine bases – exhibits sp^2 carbon,[2] with the base as a leaving group, its action in substitution reactions is unclear.

We are quite curious about whether CO_2-adducts are more active or less active toward Grignard reagents.



[1] Y. Yang, J. –W. Lee. *Chem. Sci.,* **2019**, *10,* 3905.

[2] D. B. Dell'Amico, F. Calderazzo, L. Labella, F. Marchetti, and G. Pampaloni. *Chem. Rev.* **2003**, *103,* 3857.