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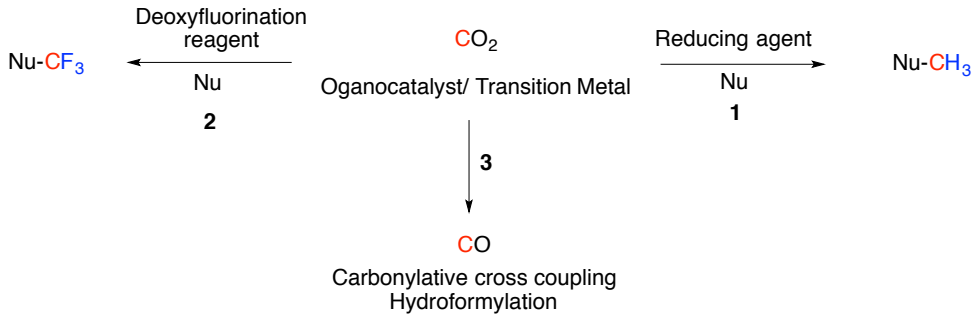
CO_2 as C_1 source for organic synthesis
Le CO_2 comme unité C1 pour la synthèse organique

Context: Reducing the concentration of atmospheric CO_2 is considered as one of the most challenging tasks that scientists are facing nowadays. Furthermore, in recent years, this challenge has been found to be highly important since the impacts of climate changes are more obvious in daily life. In recognition of the current CO_2 phenomenon, political bodies in most developing countries are implementing strategies to limit carbon growth. In parallel, the transformation of the anthropogenic CO_2 is an appealing field of research. From a chemical viewpoint, CO_2 is a cheap and abundant feedstock. Nevertheless, its transformation as a C1 source constitutes a major challenge to modern organic chemistry evoked by its thermodynamic stability and kinetic inertness. To date, a handful of industrial processes make use of CO_2 as a C1 source. In this context, the developments of new transformations based on the use of CO_2 are highly covetable. Thus, complementary to bulk industry efforts, the valorization of CO_2 has recently become more prominent in the fine chemical industry. In this context, we have established recently a new research program aiming the valorization of CO_2 as C1 source.[1]

Ph.D. Project: The aim of this Ph.D. project is to develop original methods and/or transformations to incorporate CO_2 in fine organic compounds. Herein, the use of organocatalyst/transition metal catalysis will enable innovative transformations: 1) using CO_2 in conjunction with reductant as methylating agent. 2) Deoxyfluorination reaction could take place to use CO_2 as source of trifluoromethylating agent. 3) The reduction of CO_2 to CO will allow new carbonylation/hydroformylation reactions.



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[1] K. Onida, A. Tlili, *Angew. Chem. Int. Ed.* **2019**, 58, 12545-12548.