New Catalytic Reactions using CO_2 for Radiolabeling of Tracers

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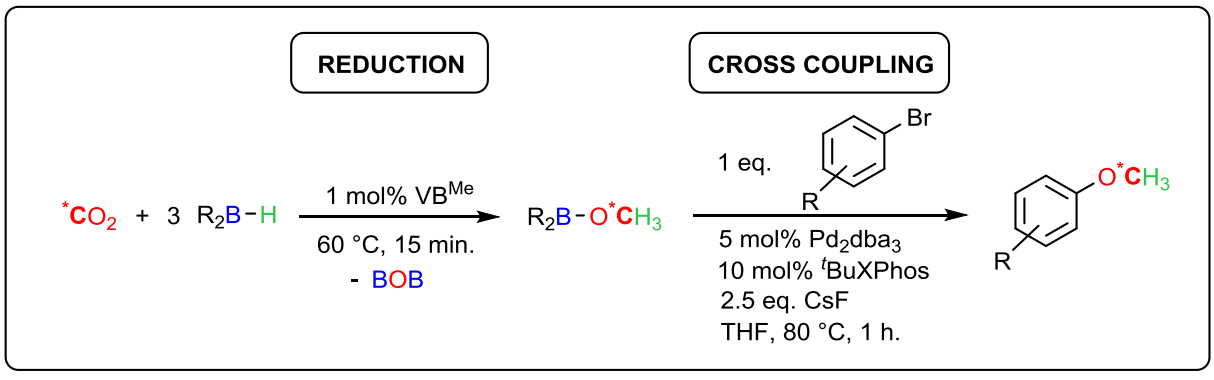
Alexia Ohleier,[a] Davide Audisio,[b] Fabien Caillé[c], Thibault Cantat.[a]

[a] CEA Saclay - IRAMIS/NIMBE/LCMCE, 91191 Gif sur Yvette Cedex. [b] CEA Saclay - DRF/JOLIOT/SCBM/LMC, 91191 Gif sur Yvette Cedex. [c] Imagerie Moléculaire In Vivo UMR1023 CEA, INSERM, CNRS, Université Paris Sud, Université Paris-Saclay, Service Hospitalier Joliot, Orsay, France
e-mail : alexia.ohleier@cea.fr

CO_2, well known as a greenhouse gas responsible for global warming and considered as a cheap, non-toxic, renewable C1 building block, is by far the most accessible primary source of carbon for all radiolabeled compounds. However, its kinetic and thermodynamic stability significantly restrains potential applications. Broader availability of secondary labeled carbon sources would therefore grant access to a wide array of highly functionalized bioactive tracers. Indeed, ^{14}C labelled compounds are commonly required during the development process of drugs where as ^{11}C molecules are key radiotracers for positron emission tomography (PET) imaging.

In this context, we have been investigating CO_2 reduction into methoxy derivatives followed by a Suzuki cross-coupling to generate anisoles moieties. Selective borane mediated organocatalytic CO_2 reduction into OMe synthons has been previously disclosed by our group. [1] However, very few couplings between methanol derivatives and aryl halides have been reported to date. [2] Inspired by Novak's work, [3] an innovative, efficient palladium catalyzed cross-coupling between methoxyboranes and aryl bromides has been developed under mild conditions. Working in a double chamber set-up allows both reactions to be compatible. This strategy is further expected to be tested on therapeutic targets and ideally transposed to ^{14}C and ^{11}C isotopes.



Statut : Post-doctorante

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