

Research Topic for the ParisTech/CSC PhD Program
(one page maximum)

Field : Chemistry, Physical Chemistry and Chemical Engineering

Subfield: Organic Chemistry

Title: Development of Original Decarboxylative Reductive Cross-Couplings

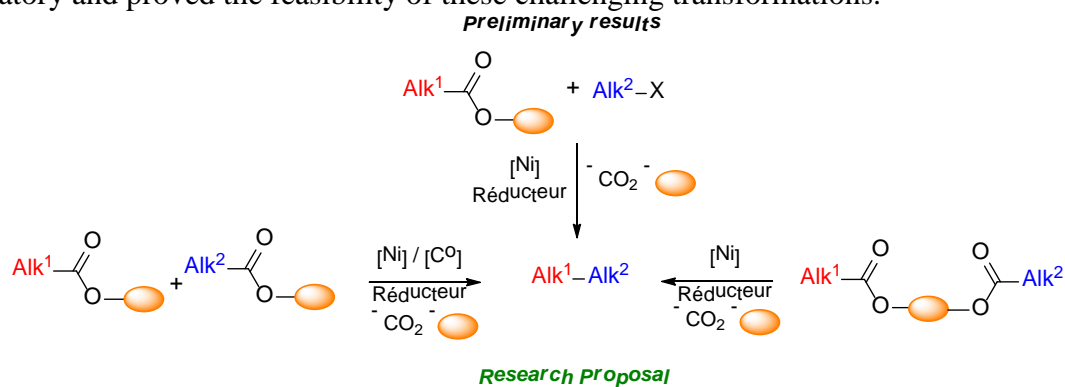
ParisTech School: Ecole Polytechnique

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Short description of possible research topics for a PhD: Metal catalysis is one of the best synthetic tools for C–C bond construction. Much effort has been devoted to the development of methods using precious metals such as palladium as catalyst. This impressive synthetic tool was awarded in 2010 by a Nobel Prize. “Classical” coupling reactions are catalysed by a transition metal to couple an electrophile, commonly an aryl halide, and a nucleophile such as an organometallic compound or an aryl boronic acid. The actual environmental concerns require to redesign completely the way to develop these coupling reactions. Therefore, the main goal of the present proposal is to develop original cross-coupling reactions involving cheap and benign carboxylic acid derivatives as sole coupling partners and eco-friendly first-row transition metal as catalyst. In addition to develop eco-compatible cross-coupling reactions, this proposal puts forward the development of new synthetic strategies to form challenging bonds such as C(sp³)–C(sp³) bond. Some preliminary results were found in the laboratory and proved the feasibility of these challenging transformations.



Required background of the student: The student should have a strong background in organic chemistry. Experience in catalysis would be an asset (but not mandatory). We are looking for a dedicated and highly motivated candidate. Moreover, the candidate should have good communication skills and a good team spirit.

A list of 5(max.) representative publications of the group:

Y. Bourne-Branchu, C. Gosmini, G. Danoun, *Chem. Eur. J.* **2018**, *accepted*

Y. Bourne-Branchu, C. Gosmini, G. Danoun, *Chem. Eur. J.* **2017**, *23*, 10043

M. Amatore, C. Gosmini, *Angew. Chem. Int. Ed.* **2008**, *47*, 2089-2092.

X. Qian, A. Auffrant, A. Felouat, C. Gosmini, *Angew. Chem. Int. Ed.* **2011**, *50*, 10402-10405.