

Research Topic for the ParisTech/CSC PhD Program

Subfield: Chemistry, Coordination Chemistry, Catalysis

ParisTech School: Ecole polytechnique

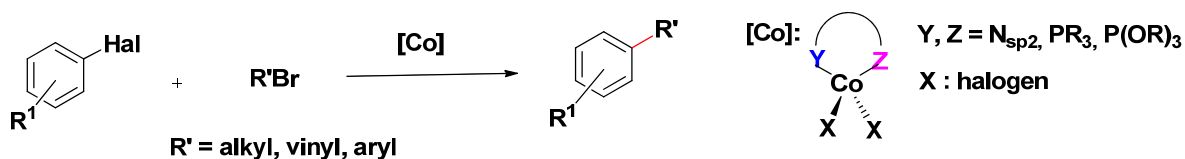
Title: Well defined complexes for cobalt catalysis

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Short description of possible research topics for a PhD:

The transition metal catalyzed coupling reactions have revolutionized the synthesis of organic molecules. For these reactions, palladium remains the most used metal nevertheless non-noble and more eco-compatible alternatives based on Cu, Fe, or Co have emerged. We reported some years ago, the first cobalt-catalyzed reductive couplings allowing the formation of C-C bond by reacting two electrophiles. This therefore avoids the preparation of often stoichiometric organometallic partner. In recent years, we have continued our research in this area and tried to take benefit of complementary skills in the laboratory to use well-defined pre-catalysts to perform those reactions with the objective to simplify the reaction mixture (avoiding for example the use of co-solvent), reduce reaction time... Thus, the PhD project deals with the synthesis of cobalt complexes featuring mixed bidentate ligands for the catalysis of reductive couplings.



Required background of the student: organic chemistry and/or catalysis, experience in handling organometallic compounds would be a plus.

Representative publications of the group:

C. Gosmini, J.-M. Bégouin, A. Moncomble *Chem. Commun.* **2008**, 3221; M. Amatore, C. Gosmini, *Chem. Eur. J.* **2010**, *16*, 5848-5852.

X. Qian, Z. Yu, A. Auffrant, C. Gosmini, *Chem. Eur. J.*, **2013**, *19*, 20, 6225-6229 ; Y. Cai, X. Qian, A. Rérat, A. Auffrant, C. Gosmini *Adv. Synth. Catal.*, **2015**, *357*, 3419-3423.

Pal, S.; Chowdhury, S.; Rozwadowski, E.; Auffrant, A.; Gosmini, C., *Adv. Synth. Catal.* **2016**, *358*, 2131-2435; Y. Cai, A. D. Benischke, P. Knochel, C. Gosmini *Chem. Eur. J.*, **2017**, *23*, 250-253.