Research Topic for the ParisTech/CSC PhD Program

Field: Chemistry, Physical Chemistry and Chemical Engineering

Subfield: Chemistry

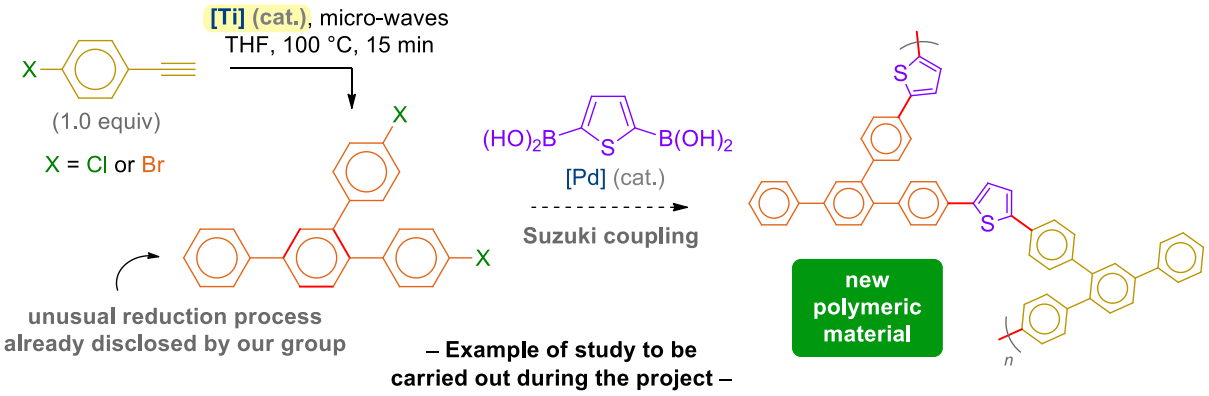
Title: DEvelopMent of the potential Of alkyne-TItanium Complexes (DEMOTIC)

ParisTech School: Ecole Polytechnique

Advisor(s) Name: Dr Yvan Six
Advisor(s) Email: yvan.six@polytechnique.edu
(Lab, website): https://portail.polytechnique.edu/lso/en/research-groups/small-rings-and-organotitanium-chemistry

Short description of possible research topics for a PhD:

The goal of this project is to extend the chemistry of alkyne-titanium complexes, generated using the Ti(O*i*Pr)$_4$/*n*BuLi reagent system, and to develop new applications thereof. Studies will be focused on: (*i*) investigations of new alkyne functionalisation reactions (in particular with CO_2 at standard pressure) and (*ii*) extension of our preliminary work on [2+2+2] cycloaddition processes, with the development of applications towards the synthesis of new materials.



Please note that other research topics are possible as well (see our website): e.g. synthesis of novel endoperoxide compounds with antimalarial activity, cycloaddition reactions from cyclopropane precursors for the synthesis of complex nitrogen-containing systems…

Required background of the student: We are looking for a student having a strong background in organic chemistry, preferably with some experience in polar organometallic chemistry. Some knowledge and interest in material science will also be valued for the project presented above.

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

- A. Wolan, J. A. Kowalska-Six, H. Rajerison, M. Césario, M. Cordier, Y. Six, *Tetrahedron* **2018**, *74*, 5248−5257. (“Barton Centennial Symposium in Print” special issue)
- V. A. Rassadin, E. Nicolas, Y. Six, *Chem. Commun.* **2014**, *50*, 7666–7669.
- F. Hermant, E. Urbańska, S. Seizilles de Mazancourt, T. Maubert, E. Nicolas, Y. Six, *Organometallics* **2014**, *33*, 5643–5653. (“Catalytic and Organometallic Chemistry of Earth-Abundant Metals” special issue)
- E. Augustowska, A. Boiron, J. Deffit, Y. Six, *Chem. Commun.* **2012**, *48*, 5031–5033.
- C. Madelaine, Y. Six, O. Buriez, *Angew. Chem. Int. Ed.* **2007**, *46*, 8046–8049.