Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name : Poisson Given names : Thomas

Status (prof., assistant prof., ...) : Professor of Chemistry

Laboratory : UMR 6014 COBRA (ZRR) Website address : http://www.lab-cobra.fr

Institution : INSA de Rouen Normandie Website address : www.insa-rouen.fr

Scientific competence of the supervisor:

Our research group is interested in the development of new methodologies for the construction of relevant fluorinated and non-building blocks. In that context, we mainly focus on the design of metal catalyzed or mediated reaction. Since the last 5 years, we devoted lots of efforts to achieve new transformation by using inexpensive and powerful copper catalysts with a strong emphasis on the elucidation of the reaction mechanism to get a fundamental overview. In additon, we established a strong research topic on single electron transfer based reation using copper photocatalyst and electrochemistry.

Two major publications in the field proposed for the PhD :

1. Ivanova, M. V.; Bayle, A.; Besset, T.; Pannecoucke, X.; Poisson, T. Angew. Chem. Int. Ed. 2016, 55, 14141.
2. (1)Zhong, M.; Gagné, Y.; Hope, T. O.; Pannecoucke, X.; Frenette, M.; Jubault, P.; Poisson, T. Angew. Chem. Int. Ed. 2021, 60, 14498.

Website address of the personal page :

Supervisor's email : thomas.poisson@insa-rouen.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** II-13

Title : New electrochemical formation of silyl radicals, their use in basic transformations and mechanism understanding

Subject :

Nowadays, the quest for new methodologies and reagents to efficiently synthesize valuable silicon containing building block is very important and very appealing for scientists. In addition, the understanding of these transformations is still important to push the contemporary boundaries of knowledge. Indeed, only few scientific reports discussed the mechanism of these reactions, hampering their use.

Besides, electrochemistry, although known for years is a powerful tool to develop new transformations, impossible so far. Thanks to the newly developed commercially available set-up, which are worldwide supplied, electrochemistry is in its renewal.

Taking advantage from our expertise and willing to push beyond the boundaries of knowledge in radical chemistry, particularly the silicon radical chemistry, we intend to develop new electrochemical transformations to develop more efficient transformations with a better understanding. The addition of silyl radical, on cyclic, aromatic, and original scaffold has been poorly studied and will be achieved within this project. A strong emphasis will be devoted to the fundamental understanding of the reaction mechanisms to decipher the nature of the reactive radical. These fundamental results will be share with the whole community through publications.

Keywords :

Radical Chemistry; Synthetic methodology; Electrochemistry; Reaction Mechanism

Expected collaborations :

Background required from the applicant :

A Master degree in Organic Chemistry, good knowledge of the analytical methods (NMR, MS…)

Existence of a PDF file detailing the proposal ("yes" or "no") : YES

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