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 : COUVE-BONNAIRE Given names : Samuel

Status (prof., assistant prof., …) : Full Professor

Laboratory :	CARMeN Institute - UMR 6064	Website address : http://www.lab-cobra.fr
Institution :	Institut National des Sciences Appliquées - Rouen Normandie	Website address : http://www.insa-rouen.fr/

Scientific competence of the supervisor:

Our research group is working on the development of new methodologies for the construction of relevant fluorinated building blocks. My research deals with fluorinated alkenes (fluoroalkene, trifluoromethylalkene or derivatives) which can find many applications in medicine or materials. These last years we have developed new modern and elegant strategies to construct organofluorinated molecules bearing these relevant fluororinated alkene motif.

Two major publications in the field proposed for the PhD :

1. « Organophotocatalysis Enables the Synthesis of gem-Fluorophosphonate Alkenes ». Morand, S.; Lecroq, W.; Jubault, P.; Lakhdar, S.; Bouillon, J.-P.; Couve-Bonnaire S. Org. Lett. 2022, 24, 8343−8347.
2. « Chemo- and Regioselective Palladium-Catalyzed Internal Hydrosilylation of gem-Difluoroallenes to Access β-Fluorinated Vinylsilanes ». Yu, X.-L.; Wen, A.-J.; Xu, Z.; Couve-Bonnaire, S.;* Xu, L.-W.; * Bouillon, J.-P.*

Website address of the personal page :

Supervisor's email : samuel.couve-bonnaire@insa-rouen.fr

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

Title : Developement of new access to fluorinated alkenes by catalysis, mechanochemistry and/or photochemistry

Subject :

Organofluorine chemistry is an area in tremendous expansion and the market of organofluorine fine chemicals still keeps growing up every year. Fluorinated molecules have applications in almost all areas of science (medicinal chemistry, agrochemistry…). Of particular relevance is the emergence of fluorinated alkenes, versatile compounds that have found many applications as, for examples, peptidomimetics, drugs and materials. Despite interesting application in biological/structural study or in medicine, the synthesis of these fluorinated alkenes is however still very challenging and classical methods for their preparation suffer from major limitations, which clearly disallow their full development. There is therefore a strong need for new processes that would tackle this major challenge in chemical synthesis. In this proposal, we aim at developing new relevant pathways towards fluorinated alkenes via catalysis, metathesis, photocatalysis or mechanochemistry. These novel methodologies will allow the development of new fine fluoroalkene chemicals which could have many applications such as fluoroanalogues of biorelevant molecules. To support this research program we are looking for an outstanding and highly motivated candidate to pursue his PhD within our group.

Keywords :

Organofluorine Chemistry; Catalysis; Asymmetric Synthesis; Mechanochemistry; Photochemistry

Expected collaborations :

Background required from the applicant :

A Master degree in Organic Chemistry with excellent knowledge in organic synthesis and good knowledge of the analytical methods dedicated to organic molecules (NMR, MS…).

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

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