

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 6064 Institut CARMeN (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 electrochemistry with a strong emphasis on the elucidation of the reaction mechanism to get a fundamental overview.

Two major publications in the field proposed for the PhD :

1. Feng, T., Biremond, T. Jubault, P., Poisson, T. Electrochemical Synthesis of Allenyl Silanes and Allenyl Boronic Esters. Nature Communication 2025, accepted.
2. 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 : Electrochemical silylation with silane or chlorosilanes

Subject :

The development of new methodologies and reagents is of paramount interest for the rapid expansion of green chemistry. Besides, silicon containing building blocks are very important and very appealing for scientists. Thus, methods to synthesize these molecules are of high interest. 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. We recently developed several reactions for the electrochemical synthesis of silylated molecules most of them using the Suginome reagent. Here we would like to found alternative reagents (ie silane or chlorosilanes) that would avoid the use of this non stable reagent. A peculiar attention will be paid to inexpensive and commercially available silylated reagents. Taking advantage from our expertise in the field and willing to push beyond the boundaries of knowledge in radical chemistry, we intend to develop new electrochemical transformations to develop more efficient transformations with a better understanding. The formation of silyl radicals through a new electrochemical is sought after. 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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