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 : Brière | Given names : Jean-Francois

Status (prof., assistant prof., ...) : CNRS senior research scientist

Laboratory : COBRA - UMR 6014 | 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 interested in the functionnalisation and construction of chiral heterocycles and valuable building blocks, especially for the elaboration of 3D-fragments. To do so, we developped an expertise in organocatalysis, using mainly Bronsted bases and quartenary ammoniums salts. We recently got interested in electrosynthesis as a new tool to perform sustainable and efficient radical processes and we aim to exploit our knowledge in organocatalysis to develop enantioselective electro-mediated reactions.

Two major publications in the field proposed for the PhD :

1. Plesniak, M. P.; Huang, H.-M.; Procter, D. J., Radical cascade reactions triggered by single electron transfer. Nat. Rev. Chem. 2017, 1, 77
2. Chang, X.; Zhang, Q.; Guo, C. Asymmetric Electrochemical Transformations. Angew. Chem. Int. Ed. 2020, 59, 12612

Website address of the personal page : http://www.lab-cobra.fr

Supervisor's email : jean-francois.briere@insa-rouen.fr

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

Title : Merging Electrosynthesis and Organocatalysis

Subject :

Although neglected for decades, radical chemistry has recently witnessed a blossoming renaissance, especially due to the re-emergence of eco-efficient techniques, such as photoredox and electrochemistry. The mild conditions afforded by these tools enabled the construction and functionalization of complex molecules, and especially the development of enantioselective radical reactions for the elaboration of valuable chiral molecules. Yet, in electrosynthesis, examples using organocatalysts to induce chirality remains scarce.

Based on our expertise in organocatalysis and our recent interest in electrosynthesis, we aim at developing efficient constructions of 3D-molecular building blocks via radical processes by exploiting electricity for the transfer of single electron and organic catalysts for facilitating the reaction and eventually inducing chirality.

To support this research program, we are looking for an outstanding, open-minded and highly motivated candidate to pursue his PhD within our group.

Keywords :

Green chemistry, radical chemistry, electrosynthesis, organocatalysis, chiral molecules

Expected collaborations :

Create a network of researchers interested in asymmetric radical chemistry, especially mediated by electrosynthesis and organocatalysis.

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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