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 : VULUGA Given names : Daniela

Status (prof., assistant prof., ...) : Lecturer

Laboratory : Polymers, Biopolymers, Surfaces Website address : https://www.pbs.cnrs.fr/en/home/

Institution : INSA Rouen Normandy Website address : http://www.insa-rouen.fr/

Scientific competence of the supervisor:

Polymer and organic chemistry, Polymerisation in continous flow reactor, biobased self-healing coatings

Two major publications in the field proposed for the PhD :

1. J. B. Garrison, R. W. Hughes, B. S. Sumerlin, ACS Macro Lett. 2022, 11, 441; 10.1021/acsmacrolett.2c00091.
2. Marcus H. Reis, Frank A. Leibfarth, Louis M. Pitet, ACS Macro Lett. 2020, 9, 1, 123–133

Website address of the personal page :

Supervisor's email : daniela.vuluga@insa-rouen.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** IV-10

Title : Electrocatalysed synthesis of bio-based polymers in a continuous flow reactor for a sustainable chemistry

Subject :

The main idea of the ePolymFlow project is based on the production of polymers by ferroelectro-catalysed atom transfer radical polymerisation in a gentle and controlled manner from acrylate monomers derived from biomass in a conventional cell and in continuous flow. By combining electrochemical activation (sustainable conditions) and flow chemistry (residence time control, improved faradic yield), we plan to effectively control the formation of biobased polymers by introducing a redox-active comonomer to give them different recycling options.
The methodological study we are planning will therefore be divided into three work packages (WP):
1. Ferroelectro-catalysed radical atom transfer polymerisation of methyl methacrylate
2. Continuous flow transposition
3. Introduction of a single co-monomer for two possible types of degradation

Keywords :

Acrylates, Electrosynthesis, ATRP, Iron, Flow chemistry, Biobased products, Degradation

Expected collaborations :

This thesis project is proposed as a joint supervision with Dr. Laëtitia CHAUSSET-BOISSARIE (CNRS Research Scientist)at CARMeN Institute (UMR CNRS 6064, Université de Rouen Normandie)

Background required from the applicant :

The applicant must have a master's degree in organic or polymer chemistry. A good level of English or French is required.

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

(see guidelines on the website www-csc.utt.fr)