POST-DOCTORAL position: Degradable Polypyrophosphates Based Elastomeric Networks by photocatalysis (DOLORES)

Context :

Elastomers are a class of materials that exhibit unique mechanical properties combining high elasticity and significant resistance to deformation, which allows their use in many fields, such as automotive components, sports equipment and medical devices. Both from the point of view of managing their end of life and of the applications where their degradation is desired (for example, for temporary prostheses, or tissue engineering), their non-biodegradability is a major drawback. In this context, the **DOLORES** project proposes to design elastomers by including degradable covalent bonds into the skeleton of elastomers in order to improve their degradability while preserving its physical properties. The chemical process that will be developed in the **DOLORES** project does not require the polymerization of elaborate monomers, thus avoiding complex syntheses and important purification steps. It uses existing non-biodegradable polymers and transforms them into biodegradable polymers via the introduction of phosphorus-based functional groups by new photocatalysis process.

Within the framework of the "LabEx Synorg Post-doc 2023 Call", the **DOLORES** project was selected for funding with a 12 months research fellowship. The research project will be performed in the Polymers team of LCMT laboratory in Caen (https://www.lcmt.ensicaen.fr/).

Activities :

The recruited PhD candidate will be in charge of:

- Setting up the reaction conditions of phosphorus-based polydiene by photocatalysis process.
- Purification of the obtained polymers and oligomers using regular purification techniques (precipitation, flash chromatography, and so on…)
- Analyses and characterization using NMR, IR, SEC, DSC
- Biodegradation tests
- Writing of reports and publications
- Literature survey related to the project

Context of the work :

This work will take place in the Laboratoire de chimie Moléculaire et Thioorganique (LCMT) which is part of the « Institut Normand de Chimie Moléculaire, Médicinale et Macromoléculaire » (INC3M Federation). With more than 200 researchers, INC3M meets the requirements for a high-quality level of research in the fields of organic synthesis, macromolecules, and medicinal chemistry. The LCMT, laboratory (UMR-6507) is gathering researcher from CNRS, Caen Normandy University and ENSICAEN, and is a leading partner of the 2 LABEX SynOrg and EMC_3M, the Carnot I2C institute and the EUR XL Chem, a proof of the excellence of the laboratory. LCMT is a major player in the field of the molecular and macromolecular chemistry. It participates in national (ANR) and European

projects (INTERREG IV, COST). In addition, it has developed various long-term public-private partnerships with chemical industries and research institutions in France and abroad.

Complementary Information:

Place of work: LCMT laboratory
Type of contract: fix-term
Duration: 12 months
Starting date: 1st October 2023 (It will probably be possible to start in November or December 2023)
Salary: 2 900 € / month (gross salary)
Profile: PhD in polymer chemistry
Required experience: None
Working time: full-time

Expected skills:

We are looking for an outstanding and highly motivated **PhD in organic chemistry** or **polymer chemistry** with excellent knowledge in polymer synthesis and polymers characterization (NMR, SEC, IR, DSC…).

In addition, we are expecting:

- Good communication skills to work within a team
- Independence
- good organizational skills
- Good writing and reporting skills

Selection process

The applicant should provide a CV, a cover letter (please indicate the desired starting date), and the coordinates of 2 scientific managers who can be contacted, to Pr Isabelle Dez (isabelle.dez@ensicaen.fr) by email.

Due to the summer holidays, applications will be reviewed end of August.

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