

## Recruitment for a 12 months post-doctorate position

### Towards Biosourced polystyrene from lignin derived compound (LDC) Using Sustainable Transformation methods (BioMUST)

**UTC-MSTD 2023-2024 funding**

#### Research project

**BioMUST** aims to prepare **biosourced** materials for **packaging application** starting from LDCs. To reach this goal, direct valorization of LDCs for the synthesis of polystyrene-type polymers will be achieved. The idea is to perform functional arrangements on benzaldehydes, obtained from lignin, to yield -after alkylation and olefination- a series of styrene derivatives. Such monomers will be employed in radical polymerization to yield polystyrene-type materials. *In vitro* tests using model bacteria but also specific bacterial strains reported to (at least) partially degrade polystyrene will be performed to assess the end of life of the biosourced polymers produced in this project.

Environmentally-friendly transformation of LDCs into monomers will take place within the **TIMR lab** of **UTC Compiègne**, while the macromolecules will be synthesized using green processes in **IPCM lab** of **Sorbonne Université** (PARIS). The microbiological experiments will be carried out in **TIMR lab** (Compiègne).

#### Missions :

- He/She is expected to engage with the research teams of both laboratories on the three main tasks.
- He/She will contribute to the transformation of the phenolic aldehyde compounds into vinyl compounds and characterize them.
- He/She will perform free radical and/or controlled radical polymerization and characterize the obtained macromolecules.
- He/She will do the microbiological tests and biodegradability assessment

#### Required Qualifications :

- A recent Ph.D in Polymer Chemistry or any related field with experience in macromolecular synthesis (not more than 2 years after PhD). Experience in organic chemistry is recommended.
- Additional skills on controlled radical polymerization or in microbiology will be a plus.
- Proficiency of analytical techniques to characterize the macromolecules will be essential.
- A strong command of written and spoken English is highly recommended.
- Ability to work collaboratively, good communications, laboratory, and organizational skills.

#### Disciplines / Keywords :

Organic and **Polymer Chemistry**; Macromolecular Engineering; Green Chemistry ; **Biobased polymers**; **Biodegradability**

| <b>Salary</b>  | <b>Duration</b>  | <b>Application</b>  |
|--|--|---|
| 30-31 k€/year  | 12 months<br>Starting 12/2023-01/2024  | Curriculum Vitae // Publication List //<br>References from two people & contact details |
| <b>Contact</b>   | <b>Location</b>  |   |
| <b>IPCM lab, Sorbonne Université :</b><br>Fanny Coumes<br><a href="mailto:fanny.coumes@sorbonne-universite.fr">fanny.coumes@sorbonne-universite.fr</a> | Polymer Chemistry team (ECP) IPCM – UMR 8232 CNRS<br>Sorbonne Université /Campus Pierre & Marie Curie<br>4, Place Jussieu, 75005 PARIS – France<br><a href="https://ipcm.fr/index.php/recherche/presentation-chimie-des-polymeres/">https://ipcm.fr/index.php/recherche/presentation-chimie-des-polymeres/</a> |   |
| <b>TIMR lab, UTC Compiègne :</b><br>Vincent Terrasson<br><a href="mailto:v.terrasson@escom.fr">v.terrasson@escom.fr</a>                                | OCAT team – TIMR – UTC ESCOM ; Centre de recherche de Royallieu<br>rue du docteur Schweitzer, CS 60319 ; 60203 Compiègne Cedex France<br><a href="https://timr.utc.fr/">https://timr.utc.fr/</a>   |   |
| <b>Université La Salle :</b><br>Victorien Jeux<br><a href="mailto:victorien.jeux@unilasalle.fr">victorien.jeux@unilasalle.fr</a>                       | Transformation & Agroressources, ULR 7519<br>19 rue Pierre Waguët 60000 Beauvais<br><a href="https://beauvais.unilasalle.fr/">https://beauvais.unilasalle.fr/</a>  |   |