

POST-DOCTORAL POSITION

Eco-design of In-Chain Functionalized Polyethylenes from Catalytic Ethylene-CO Copolymerization

Topic specifics:

This project takes place in the CP2M laboratory in Villeurbanne (CP2M: Catalysis, Polymerization, Processes & Materials - UMR 5128 - CNRS - CPE Lyon – University Claude Bernard Lyon 1; <https://www.cp2m.org>) under the supervision of Dr Sébastien NORSIC and Dr Vincent MONTEIL.

The project's framework is a collaboration between CP2M laboratory and University of Constance (Pr. Dr. Stefan Mecking) funded by a France-Germany PRCI ANR program (SUPRCAT project).

Polyethylene is the largest produced plastic material, used in many key technology areas. Its production efficiency is superior to most other plastics in terms of environmental impact. The linear hydrocarbon chains of polyethylene (HDPE) enable crystalline packing and provide excellent mechanical properties. However, their chemically inert nature results in persistence for many decades when released to the environment.

It has been found that polyethylene materials with in-chain keto groups can be generated by non-alternating copolymerization of ethylene with carbon monoxide. These endow the material with a desirable photodegradability, while not compromising the processing and materials properties (Science 2021, 374, 604). Gas phase polymerization can be considered the most advanced process for the generation of semicrystalline polymers as it is solvent-free and enables a direct control of the resulting polymers' morphology. For the copolymerization of ethylene with polar monomers in general, gas phase polymerization has been neglected essentially, however.

This project will study the catalytic gas phase copolymerization of ethylene with carbon monoxide. Supported catalysts will be explored in gas phase copolymerizations to keto-polyethylenes, addressing amongst others support fragmentation and morphology evolution, and effect of support and gas phase conditions on the catalysts' fundamental copolymerization behaviour.

Laboratory: Catalysis, Polymerization, Processes & Materials (CP2M) Laboratory, UMR 5128

Candidate requirements:

- Doctorate in catalysis or polymer chemistry
- Knowledge of polymerization chemical engineering would be considered a strong asset

Catalysis, Polymerization, Processes & Materials (CP2M), UMR 5128,
CNRS, Université Claude Bernard Lyon 1, CPE Lyon – campus La Doua, 3 rue Victor Grignard,
Villeurbanne, France



Université Claude Bernard



Additional Info

Length: 2-year contract

Apply by: 15/10/2024

Salary range: > 35 k€ & < 45 k€ annual gross income (depending on experience)

Starting date: from October 2024

How to apply for the position?

Please provide: Curriculum Vitae and Recommendation Letter (or references)

Contact(s)

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