Post-doc opportunity at the IMP laboratory (24 months) starting early 2025

Innovative Upcycling of Polypropylene-Based Automotive Waste: Formulations for Robust Processing

Context:

The REACTIF collaborative project aims to develop innovative approaches in designing and manufacturing of eco-friendly, lightweight plastic body parts for the automotive industry. This project focuses on incorporating high percentages of recycled plastics while balancing economic feasibility for mass market and micro-mobility applications.

Piloted by OPmobility, this project covers the entire value chain, from collecting and treating end-of-life vehicle components to integrate them into new automotive parts. In this context, the research will focus on the in-depth characterization of recycled materials and their reformulation to develop systems that meet automotive body part standards, with particular attention to processability and paintability.

Postdoctoral Work Description:

As a postdoctoral researcher, you will be involved for a 24-month work focusing on:

1. Characterizing and understanding the composition of recyclates (chemical, thermal, morphological analyses…)
2. Studying processability: behavior in injection molding and correlations with rheological, thermo-mechanical properties and PvT diagrams.
3. Developing processes to remove and compatibilize impurities in recyclates through eco-friendly washing processes and reactive extrusion.
4. Enhancing formulations to increase recyclate concentration while maintaining required standards of automotive body parts.

This project will mainly take place at the IMP laboratory (Ingénierie des Matériaux Polymères, UMR CNRS 5223) in Lyon, under the supervising of R. Fulchiron and V. Bounor-Legaré, while remaining in connection with OPmobility development facilities (Sigmatech R&D center for Exterior Business Group).

Profile:

- PhD in polymer science or a related field.
- Knowledge in polymer physico-chemistry, rheology and melt properties.
- Experience in extrusion and melt compounding.
- Hands-on experience in mechanical characterization techniques (e.g., traction, flexural testing, Charpy).
- Previous knowledge in microstructure characterization and phase identification (e.g., SEM, AFM)

Contacts
Please send your CV and motivation letter to:

- René Fulchiron : rene.fulchiron@univ-lyon1.fr
- Véronique Bounor-Legaré : veronique.bounor-legare@univ-lyon1.fr

IMP Laboratory Description:

The Polymer Materials Engineering Laboratory (IMP, UMR CNRS 5223) is a joint research unit involving the CNRS and three higher education and research institutions: INSA of Lyon, Claude Bernard Lyon 1 University and Jean Monnet Saint-Etienne University. The IMP laboratory brings together nearly 200 people, including 83 permanent staff and more than 110 doctoral and post-doctoral students. The Laboratory has a unique set of skills covering the entire value chain in the field of polymer materials. The strength of the IMP lies in its ability to coordinate scientific knowledge and the means to implement a multi-scale and multi-disciplinary engineering approach by assembling fundamental building blocks from the chemistry and physics of polymers involved in implementation processes in the laboratory, but also at the pilot scale to design polymer materials with a controlled architecture, respectful of the environment and with functionalities.

OPmobility Description:

OPmobility is a world-leading provider of innovative solutions for a unique, safer and more sustainable mobility experience. Innovation-driven since its creation, the Group develops and produces intelligent exterior systems, customized complex modules, lighting systems, clean energy systems and electrification solutions for all mobility companies. With a €11.4 billion economic revenue in 2023, a global network of 152 plants and 40 R&D centers, OPmobility relies on its 40,300 employees to meet the challenges of transforming mobility.

By adding intelligent functions, lighting & sensors etc and by extending the scope of what is possible in terms of design, OPmobility is making cars safer, smarter and more stylish. Body panels are now packed with technologies that improve the driver experience, safety and vehicle appearance. The result? An elegant car that will, in time, be made largely from bio-sourced or recycled materials.

Our ambition? Provide automakers with cutting-edge equipment and solutions to develop tomorrow’s clean and connected car.