Horizon Europe - Marie Sklodowska-Curie - Doctoral Networks
ReBond: A Universal platform for recycling plastic waste using dynamic covalent bonds

Doctoral Candidate 6
Influence of vitrimers on the viscoelastic properties and structure of degraded semi-crystalline polymers

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This PhD project is part of the European Doctoral Network 'ReBond', which involves eight Universities, five industrial partners and 15 PhD students. By combining the expertise of the different partners in synthesis, advanced characterization, linear and nonlinear dynamics, mechanical properties, modelling, and plastic product development and processing, we shall uncover the underpinning relationships among processing and performance of vitrimer-based recycled plastics and elastomers.

Within this framework, the objective of this PhD project will be to investigate how vitrimers can be used to improve the properties of degraded semi-crystalline polymers. This study will mainly focus on the linear viscoelastic properties and on the crystallization process of high-density polyethylene samples.

This project contains experimental works, mainly based on rheometry techniques and scattering techniques. It also requires the use and development of mesoscopic models to describe the rheology of these vitrimers.

ReBond is a highly interdisciplinary and inter-sectorial project, the groups involved are world-leaders in their fields, and the tasks strategically designed to ensure strong synergies. It offers young researchers an extraordinarily diverse training platform with a deep grasp of soft matter and unique exposure to industrial environment, needed to address emerging scientific and technological challenges.

The applicant must have a Master's degree in material science, physics, or engineering. The applicant should have a good background in polymer physics and in rheology. For the modelling part of the project, good knowledge of Matlab or Python is required.

Applications should be sent by email (a single pdf file containing a detailed CV, a transcript of marks obtained during the Master, a motivation letter, and the names of two referees) to: rebond-manager@uclouvain.be

The applicant has to clearly indicate the number of the project(s) for which he/she is applying.

Starting dates: between October 2023 and December 2023

Project duration: 36 Months at UCLouvain (Belgium) and 12 Months at University of Ioannina (Greece)