

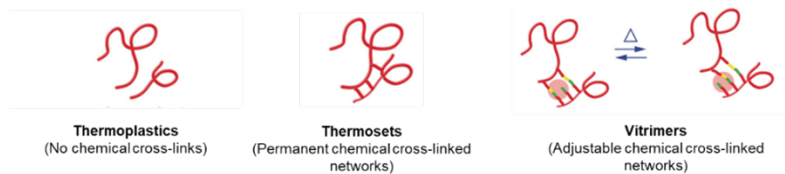
PhD position

Modelling the nonlinear rheology of polymers in the presence of vitrimers

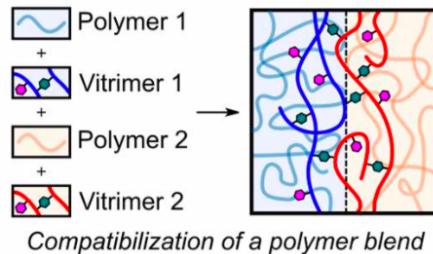
*Department of Chemical, Materials, and Production Engineering, Federico II University, Naples, Italy;
Department of Materials Science & Technology, University of Crete, Greece.*

This 3-year PhD project is part of the European Doctoral Network 'ReBond' (www.rebondproject.eu), 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.

Vitrimeric polymers consist of dynamic covalent networks, which can change their topology by thermally activated bond-exchange reactions. At high temperature, they flow like thermoplastic polymers, while at low temperature they behave like classical thermosets.



In the framework of 'ReBond', the first objective of this PhD is to develop new molecularly based models for the nonlinear rheology of homopolymer melts with added vitrimers. Polymer blends will also be considered (with the aim of understanding the role of vitrimers in compatibilization), starting from existing models developed for non-vitrimeric systems. The modelling activity will be validated against suitably designed experiments.



The PhD degree will be a double degree, jointly issued by the University of Naples (Italy) and the University of Crete (Greece). Due to EU mobility rules, the candidate must not have spent more than 12 months in Italy in the last 3 years.

The applicant must have a Master's degree in engineering, materials science or physics, with a capability in mathematical or computational analysis. Additionally, good knowledge of soft matter with emphasis on polymer physics is helpful and will be seriously considered (but not essential).

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

Salary/month: net salary is about 2.8k€ + family allowance (about 600€, if applicable).

Starting date: preferably between January and April 2024, certainly not later than September 1st 2024.

Project duration: 24 months in Naples, and 12 months in Crete.