

## Thesis Offer

### « Synthesis of new, low-impact, isocyanate-free polyurethane foams »

#### Context

Tremco Illbruck is an expert in filling, sealing, bonding and coating solutions for the construction and manufacturing industry. Tremco Illbruck believes, it is often the hidden details that play a crucial role in the success and efficiency of a project. The more stringent regulation on the use and handling of toxic products in the chemical industry has prompted the development of alternative methods that respect Human and the Environment. The market for polyurethanes (PUs) is particularly affected by these recent changes since their synthesis requires the use of (poly) isocyanates, many of which being classified carcinogenic, mutagenic and reprotoxic (CMR). To overcome this limitation, alternative routes are gaining increased attention in both academic and industrial communities.

#### Objective of work

The aim of this doctoral work is to develop new access routes to isocyanate-free polyurethane foams. The work will focus on the synthesis of monomers, porogenic agents, the study of their polymerization and the physico-chemical characterization of the formulation additives obtained. Work will continue with the formulation of these additives in industrial formulations and their characterization.

This work will be carried out within the Macromolecular Engineering and Architectures team at the Charles Gerhardt Institute in Montpellier (France), and will be carried out in collaboration with the company Tremco (Netherlands).

Duration: 36 months

Recruitment planned for June 2019 with a view to starting in October 2019

The candidate needs a Master of Science or engineer degree, specialized in polymer chemistry. Strong physico-chemistry skills of polymers are also required.

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*The IAM team, based on organic chemistry applied to polymers, is recognized for its technological integration in the development of integrated materials synthesis solutions, from monomers to polymers to meet high performance applications. For many years, it has also developed a chemistry using simple and clean processes and based on sustainable development (polymers derived from renewable resources, substitution, etc.). It is also recognized for its expertise and expertise in the macromolecular chemistry of P and F heteroatoms.*