

## Internship Position – University of Bordeaux Chemistry and Physical Chemistry of Polymers

### Industrial collaboration

Laboratoire de Chimie des Polymères Organiques (LCPO), ARKEMA

### *New Bio-Based Rheological Additives*

This 6-month internship is part of a collaboration between the [LCPO](#) and the company [ARKEMA](#). It will take place at LCPO facilities, in Bordeaux, under the joint supervision of both partners.

#### ARKEMA

ARKEMA is a leading company in the field of bio-economy and ecological transition. Its ambition is to become a global leader in specialty materials while placing sustainable development at the heart of its strategy and innovation. A particular focus is placed on circular economy principles, bio-based materials, lightweighting, and more sustainable industrial processes. As a responsible industrial actor, ARKEMA has set itself ambitious climate goals: to reduce greenhouse gas (GHG) emissions by 50% by 2025 (relative to 2012 levels) and to achieve carbon neutrality by 2050. To reduce its environmental footprint, ARKEMA relies on several approaches, such as the use of decarbonized energy, the development of less energy-intensive processes using biotechnologies, and above all, the use of low-impact raw materials, including those derived from polymer recycling, CO<sub>2</sub> capture and utilization, and bio-based synthons from biomass.

#### Scientific and Industrial Context

Polyurethanes (PUs) are among the most widely known and manufactured polymers in industry, particularly in the field of rheological additives. However, they require the use of highly toxic isocyanates, are poorly recyclable, and raise environmental and safety concerns. Several alternatives, such as blocked and aqueous isocyanates, show promise, but their large-scale deployment is limited by the alcohol reagents used, which are mostly not bio-based. In this context, non-isocyanate polyurethanes (NIPUs), obtained from diglycol dicarbonate (DGDC), appear to be the most suitable alternative to conventional PUs. ARKEMA's Crayvallac® rheological additives are organo-gelling agents based on polyamide chemistry containing a proportion of bio-based monomers derived from vegetable oils. The goal of the internship is to achieve 100% bio-based monomers.

#### Project Description

The objective of the collaboration with LCPO is to study the synthesis of new organo-gelling agents from bio-based monomers, based on non-isocyanate PU, polyamide, and polyester chemistries. The project will aim to synthesize these modifiers and evaluate their final gelling properties in hydrophobic systems according to ARKEMA's specifications. This will involve characterization techniques such as NMR, SEC, DSC, XRD, SEM, and rheology.

#### Candidate Profile

The candidate, enrolled in the second year of a Master's program or the final year of an engineering school in chemistry or polymer chemistry, should possess a solid foundation in organic and polymer chemistry. Proficiency in characterization techniques is also required. The candidate must demonstrate a strong motivation for research and exhibit excellent laboratory skills.

#### Candidature

Interested candidates are invited to submit a CV and a short motivation letter to the following contacts: Thomas Vidil ([thomas.vidil@enscbp.fr](mailto:thomas.vidil@enscbp.fr)), Henri Cramail ([henri.cramail@enscbp.fr](mailto:henri.cramail@enscbp.fr))