

## INTERNSHIP POSITION

**Domain :** Chemistry, Inorganic chemistry, Porcess

Proposed by the PRAYON company (<http://www.prayon.com>)

**Title :** « Preparation and characterization of polyphosphates the food industry »

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**Laboratory :** UCCS - Unité de catalyse et de chimie du solide,  
UMR CNRS 8181

**Company :** Site PRAYON located at Engis (Belgium)

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### SUJET DU STAGE

The PRAYON company is a world leader in the production of phosphates. These are used in numerous technical applications (metal processing, detergents, batteries, ...) or food (meat, cheese, pastries, ...).

Specifically in the field of pastry, manufacturers commonly use baking powders that work by the reaction, in a controlled manner, of an acidic agent (typically a phosphate) with a basic agent (generally sodium bicarbonate). To be effective, most of the reaction should take place in the oven, under the action of heat. This is called the “delayed effect”.

One of the most commonly used acid phosphate is sodium acid pyrophosphate (SAPP). During the academic year 2014-2015, research efforts have been made to understand the origin of the delay effect induced by the molecule of SAPP.

The internship project aims to:

- Identify new polyphosphates with acidic nature
- Prepare the precursors in the laboratory
- Convert these precursors with acid agents, and characterize the effect
- Validate application performance delays and improve their delayed effect
- Assess if their production is compatible with the technology of calciner / continuous granulator available in the factories of Prayon.

The internship will take place on the first industrial site of PRAYON Engis (B), to allow the trainee to learn phosphate chemistry, synthesis tools (laboratory, pilot, industrial), the application and pastry, and achieve the synthesis of precursors (spray dryer).

The second part of the internship will take place at UCCS to:

- Characterize the precursors by DSC-TGA.
- Characterize the products using techniques such as X-ray diffraction in temperature, electron microscopy, and solid state NMR.

If the synthesis of molecules proves to be compatible with available industrial technology, then the course will be conducted within a pilot test.

The training period is six months. The trainee will benefit from an internship gratification.