

**INSTITUTION:** University of Lille

**Laboratory(s) to which they are attached :** Unité de Catalyse et Chimie du Solide (UCCS)

**Scientific field, Specialty :** Catalysis

**Thesis supervision :** Pr Mickael CAPRON

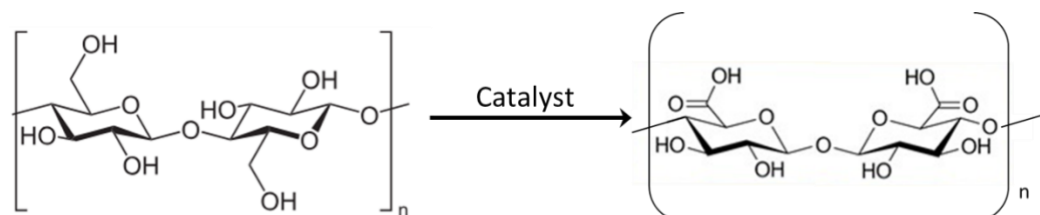
**Co-supervision :** Pr Karine Vigier De Oliveira

**Thesis title:**

**THESIS SUBJECT (about 1/2 page)**

This PhD is partially included in the ANR APERO project (**A**dvanced catalysts **P**roperties **E**nhancement and **R**eaction condition **O**ptimizations for cellulose valorization). The main objective of this project is **the oxidation of cellulose to produce celluronic acid using heterogeneous catalysis**. The products formed could find applications in detergents or packaging for food or health industries for instance [J Polym Environ 13(3) (2005) 261].

Two main challenges will have to be tackled: i) to increase the reactivity of cellulose by appropriate pre-treatment, ii) to selectively oxidize the C6 carbon of each glucose unit of cellulose. Two PhDs will be involved in this project.



***Schematic oxidation of cellulose in celluronic acid***

The focus of this PhD will be mainly on the second part of the project and will consist in using heterogeneous catalysts developed by the first PhD student in the oxidation of cellulose to determine the best catalysts formulations, along with the optimal reaction conditions. Heterogeneous catalysis will be coupled with mecanochemistry to enhance the reactivity of the cellulose. This Phd will be shared between IC2MP in Poitiers (especially working on mecanochemistry) and UCCS in Lille (working on oligosaccharide oxidation).

**Planned recruitment date:** 01/10/2026

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**Additional Notes/Comments:**

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