PhD offer: Molecular Supported Catalysts for Olefin Polymerization

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Work context: Polyolefins are the most important class of thermoplastics with a yearly production of ca. 170 million tons. They are everywhere in our daily life with applications in advanced packaging, automotive industry, in fluid transport, or medicine. Based on their diverse uses they meet the demand of sustainable development via in particular the reduction of energy consumption. The field of polyolefins has changed with the discovery, in 1976, of the capability of organometallic complexes, in particular the group 4 metallocenes, to be activated in the form of a cation by methylaluminoxane. The development of single-site catalysts has allowed major breakthroughs in the field of polyolefins. The first one is the access to new specialty polyolefins by copolymerizing olefins with various comonomers and the second is the preparation of "homogeneous" polyolefins with better properties (mechanical, optical). In spite of considerable research development on single-site technology, their commercialization has been slower than expected. One of the main difficulties concerns the adaptation of single-site catalysts to main processes of olefin polymerization. Actually, the major production capacities for polyolefins are based on slurry and gas-phase processes because they are less energy consuming. The main requirement of these processes is the formation of polymer particles, which is insured by a controlled fragmentation of the catalyst grains. This means that these processes require the use of supported catalysts.
The CP2M laboratory and INEOS have been collaborating for several years to develop well-defined molecular supported catalysts for the preparation of performance polyolefins. This project is focused on the mechanistic study, the implementation and the optimization of the developed catalysts.

Required skills: A master degree or a diploma of a French Engineering School (or equivalent) is requested with a chemistry specialization and knowledge in organometallic chemistry and in polymerization chemistry. Autonomy, anticipation, proactive spirit, spirit of initiative, being a source of proposals, teamwork skills are requested.

Application: Applications should be submitted on the CNRS employment website using the following link: https://emploi.cnrs.fr/Offres/Doctorant/UMR5128-CHRBOI-008/Default.aspx. The candidate must provide a letter of motivation, a CV including the contact information of two advisors. Remuneration: 2135 euros gross monthly.

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