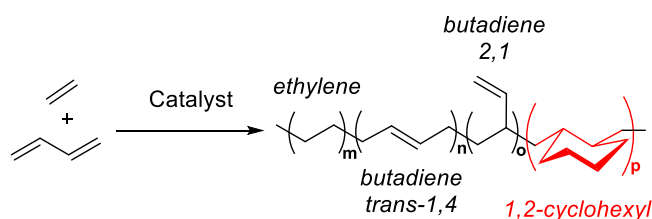


**Research Collaboration between ICBMS-CP2M-Michelin
within the CHEMISTLAB
(a joint laboratory between ICBMS, CP2M and Michelin)**

Subject open to the INSA LYON selection process

Precision macromolecular engineering based on ethylene and conjugated diene building blocks to design sustainable elastomer materials

The ICBMS (UMR 5246), the CP2M (UMR 5128) and Michelin have partnered around a research program oriented towards the design of new-generation elastomers meeting high criteria of performance, recyclability and low environmental impact. We are developing a global approach that integrates the entire life cycle of elastomers, from raw materials to reuse/recycling. In particular, this work has led to the discovery of a family of copolymers containing ethylene, butadiene and ring units. These new rubbers, known as ethylene butadiene rubber (EBR – see the scheme below), are a particularly attractive class of materials for applications in durable tires, thanks to their improved resistance to wear.



Scheme. Synthesis of EBR by copolymerization of ethylene with butadiene.

We are seeking to enrich the EBR family of synthetic rubbers by modulating the characteristics of the polymer, synthesizing new EBR-based architectures. To meet this challenge, a combination of several catalysts or different polymerization chemistries (anionic and coordination catalysis) will be implemented. The key stage in the polymerization process lies in the ability of the growing polymer chains to shuttle between two different polymerization systems, thereby enabling unprecedented microstructures to be achieved. A joint experimental / theory investigation will be performed to fully master the original polymerization process.

Required skills: Applicants should have a Master Degree in Chemistry. Strong knowledge of organometallic chemistry and/or catalysis is required. He should be interested in mechanisms and rational development of catalytic systems, in polymer chemistry and physico-chemical characterization of polymers.

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