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Title: "Mechanochemical processes for the development of synthetic methodologies"
Position: Full Doctorate
Keywords: Synthetic methodologies, Organofluorine chemistry, Mechanochemistry, Sustainable chemistry

Although mechanochemistry has been known for centuries, its application has long been confined to inorganic synthesis and materials science. Only in recent years have organic chemists begun to exploit this technology, primarily as a means to eliminate or significantly reduce solvent use in synthetic methodologies, thereby aligning with several of the twelve principles of green chemistry. The reliance on solvents is increasingly recognized as environmentally deleterious due to their origin from fossil resources as well as the energy-intensive processes required for their production, purification, recycling and storage. Replacing solvents with mechanical energy not only improves the sustainability profile of chemical processes but often leads to shorter reaction times, enhanced reactivity and selectivity, and enables the use of reagents that are poorly soluble in organic solvents. Recently, our research group, "Synthesis of fluorinated molecules", has developed a strong interest in the use of ball-milling for the preparation of fluorinated molecules, successfully designing new solvent-free transformations. There is therefore a clear need to develop new synthetic strategies that enable access to value-added organic molecules while addressing the sustainability challenges of the 21st century. In this proposal, we aim to develop new mechanochemical synthetic pathways for the preparation of fluorinated molecules, which are nowadays molecules of particular importance in medicinal chemistry or agrochemistry, for instance. In particular, the generation and reactivity study of radical and carbene intermediates under solvent-free conditions will constitute a central focus of the proposed PhD work.
To support this research program, we are seeking an outstanding and highly motivated candidate to pursue his PhD within our group.

Requirement for the position: a Master degree in chemistry

URL: http://www.lab-cobra.fr/?equipe=synthese-de-bilomolecules-fluorees
Laboratory: UMR 6064 CNRS- CARMeN Institute, Université et INSA de Rouen
Ecole Doctorale Normande de Chimie N° 508

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