Groupe d'Etudes en Chimie Organique
63ème édition
27 août – 1 septembre 2023

Mechanochemistry as an efficient tool for synthesis

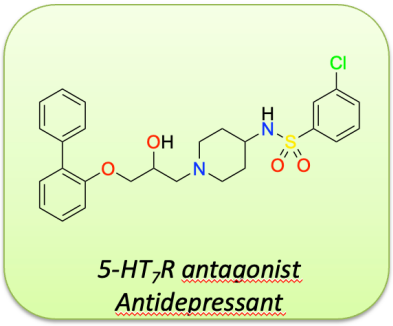
Xavier BANTREIL

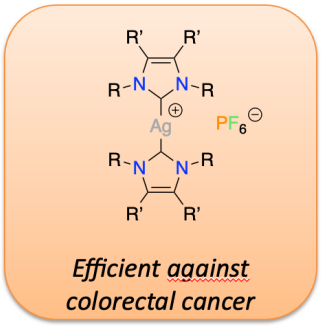
IBMM (Institut des Biomolécules Max Mousseron), Université de Montpellier, CNRS, ENSCM, 34094 Montpellier, France
Institut Universitaire de France (IUF)
E-Mail : xavier.bantreil@umontpellier.fr

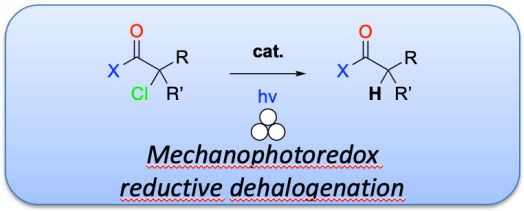
The first report of a mechanochemical reaction was made by Theophrastus of Eresus in 315 B.C. with the reduction of cinnabar into mercury thanks to grinding using a copper mortar and pestle in the presence of acetic acid. Despite this early discovery, mechanochemistry has only been recognized in 2019 by IUPAC as one of the ten technologies that could change our world.[1]

In the Green Chemistry and Enabling Technologies research group in Montpellier, we are using mechanochemistry, and more specifically ball-milling and twin-screw extrusion, to develop more sustainable methodologies for the synthesis of high value molecules.

In the past years, we developed our expertise in numerous domains, including Metal-Organic Frameworks (MOF) synthesis,[2] sustainable monomer preparation and catalyst synthesis for polymerization,[3] the synthesis of organic molecules potent against anxiety[4] and organometallic molecules featuring N-heterocyclic carbene ligands with high activity against colorectal cancer.[5] More recently, we have been focusing on merging ball-milling and photoredox chemistry for the catalytic reductive dehalogenation reaction.[6]







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