Synthesis of Flavonoid Derivatives Precursors of Active Pharmaceutical Ingredients by Mechanical Chemistry

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Abstract : Flavonoids are secondary metabolites that belong to a polyphenolic class, present in fruits and vegetables, playing a significant role in biological systems. The structural variations of these flavonoids are associated with many biological and pharmacological activities (antioxidant, anti-inflammatory, anticancer, antibacterial, antifungal, antiviral, and antimalarial). Given their importance in plants and health-promoting roles in humans, significant efforts have been devoted towards their isolation of flavonoids and chemical elaboration (organic synthesis). But with the increasing public concern over environmental degradation and future resources, it is of great importance for chemists to come up with different approaches, less hazardous to human health and the environment. Being employed in large amounts, the solvents used in organic synthesis are high on the list of environmental pollutants. To overcome these problems, our approach is to develop unconventional processes involving solvent-free conditions. The application of mechanical forces to solvent-free or solvent-less reaction mixtures through the use of ball mills offers many advantages over traditional solvent-based strategies. It is one of the unconventional activation methods, which makes it possible to overcome the use of solvents, in the context of green chemistry and more respectful of the environment.

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