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Title of the presentation: Upscaling pharmaceuticals by mechanochemistry

Abstract

Although there have been efforts to reduce the environmental impact of active pharmaceutical ingredient (API) production, the use of organic solvents (responsible for 75% of energy used) is still a critical step in many processes. Benign-by-design, mechanochemistry complies with several of the 12 Green Chemistry Principles,¹ contributing to the achievement of the United Nations Sustainable Development Goals (UN SDGs) and the European Green Deal objectives.

It is an effective and more sustainable approach to improve chemical processes and their safety,^{2,3} or to access organic molecules or pharmaceutically relevant fragments and functionalities, including APIs at different scales.

This presentation highlights case studies illustrating the upscaling of mechanochemical syntheses, both in batch and continuous modes, aimed at the environmentally friendly preparation of pharmaceuticals. It showcases how mechanical processes offer a sustainable and cost-effective pathway, facilitating the transition to a greener industry.

References

- [1] Colacino, E.; Isoni, V.; Crawford, D.; Garcia, F. *Trends in Chemistry*, **2021**, 3, 335.
- [2] Sharma, P.; Vetter, C.; Ponnusamy, E.; Colacino, E. *ACS Sustainable Chem. Eng.*, **2022**, 10, 5110.
- [3] Fantozzi, N.; Volle, J-N., Porcheddu, A., Virieux D., Garcia, F.,* Colacino, E.* *Chem. Soc. Rev.* **2023**, 52, 6680.