

A MECHANOCHEMICAL PROCESS FOR IMPROVING RESVERATROL PROPERTIES BY CO-CRYSTALLIZATION

Elena Mirabela Soare¹, Raul Augustin Mitran¹, Daniel Lincu¹, Irina Atkinson¹, Simona Ioniță¹, Adriana Rusu¹, Jeanina Pandelescu¹, Coca Iordache², Victor Fruth¹

¹Ilie Murgulescu Institute of Physical Chemistry, Romanian Academy

²TeraCrystal SRL, 67-103 Donat, 400293 Cluj Napoca, Romania
e.msore96@gmail.com

Natural antioxidant compounds, such as trans-resveratrol, could be used as an alternative for the antibiotics used in meat production, without their disadvantages. The unique physical properties exhibited by novel solid forms of a drug, such as co-crystals, can impact key pharmaceutical parameters, including storage stability, compressibility, density as well as dissolution rates and solubility, which are essential factors in achieving suitable bioavailability.

Trans-Resveratrol is a promising bioactive compound with antibacterial activity, but low bioavailability due to its low aqueous solubility. Mechanochemical synthesis is an alternative route to solution-based co-crystal synthesis, offering higher energy efficiency, reduced solvent waste, high yields and improved recovery of the final product. The aim of this study is the mechanochemical synthesis of resveratrol (R)– piperazine (P) co-crystals, used as nutraceutical compounds. Different synthesis conditions (the nature and amount of added solvent, reaction time) were investigated and their influence on the co-crystal phase and purity were determined. A reaction time of up to 1 h is sufficient for the completion of the reaction. Non-toxic solvents (water, ethanol) can be used to obtain a desired co-crystal phase with high purity.

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