Collaboration/Licensing Opportunity

University of BRISTOL
Research and Enterprise Development

Cocrystal Synthesis Using Eutectic Solvents

Benefits:

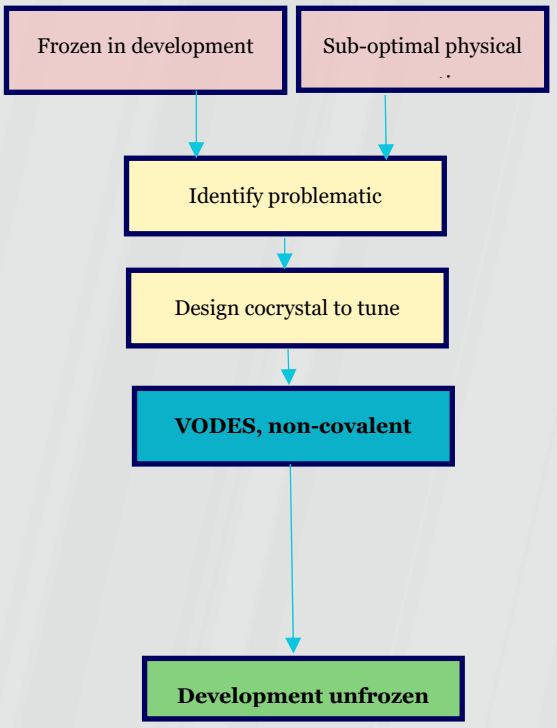
- Low-cost
- Easy to use
- Broad applicability
- Scalable
- Can be used in batch or continuous processes

Challenge

There are significant problems with polymorphism and cocrystallization in organic crystal systems. This is of concern in every industry dealing with organic molecules in the solid state, as the performance of the active ingredient is intimately linked to the properties of the polymorph and/or cocrystal. In some cases, the desired formulation cannot even be grown as cocrystals, due to incompatibility of the constituent coformers

Solution

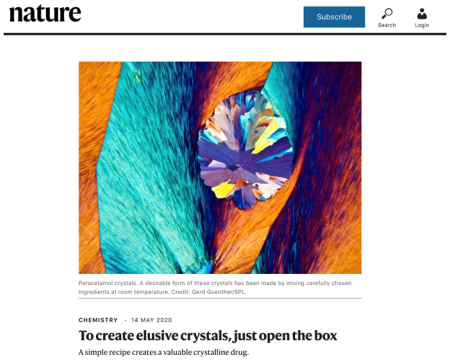
By judicious choice of a volatile hydrogen bond-donor or acceptor, solid mixtures of an active ingredient and a conformer can be made to form a liquid spontaneously at room temperature and pressure, with no need for additional stimulus. NMR indicates that the molecules remain unreacted and thus exist as a deep eutectic solvent. Removing the volatile component via processes as simple as room temperature evaporation, enables a premeditated, auto destructive capability which can lead to novel crystalline identities.



The Future

This innovation will allow industrial partners to produce bespoke materials in order to achieve new formulations and/or resolve issues with solubility and processability.

It has applicability in Pharmaceuticals; Fertilizers; Pesticides; Foodstuffs; Transistors; Lasers; Superconductors; Pigments; Explosives and Detergents.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Paracetamol crystals. A desirable form of these crystals has been made by mixing carefully chosen ingredients at room temperature. Credit: Gerd Guenther/SPL

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To create elusive crystals, just open the box

A simple recipe creates a valuable crystalline drug.

Publications
Potticary et. al., *Cryst. Growth Des*. 2020, **20**, 2877–2884.
Research Highlight, *Nature* 2020, **581**, 243.
Patent: WO 2020/169971 A1

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