

*Multi-component crystals as selective hosts*

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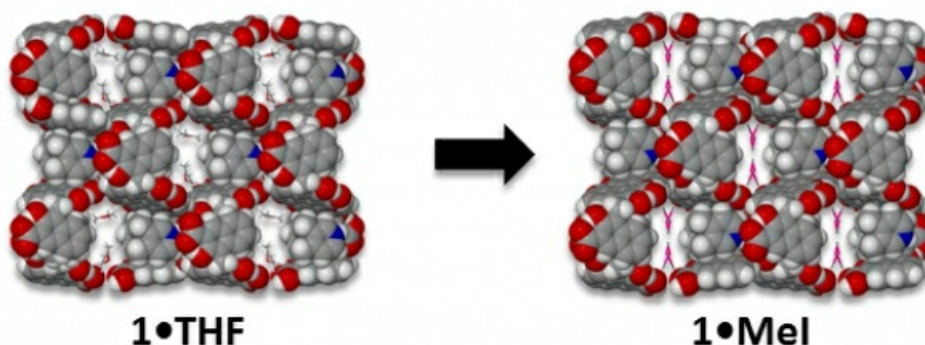
Multi-component crystals, which include both salts and co-crystals, have received much attention in the crystal engineering community due to their flexibility and the possibilities they offer in terms engineering desirable physical properties without altering key molecular properties. We have investigated the use of organic salts as molecular hosts, and as porous materials.

One salt in particular, 3,4-lutidinium pamoate hemihydrate (1), co-crystallises with a variety of solvents to form a remarkably robust framework material with stoichiometric amounts of solvent molecules included in channels [1]. When 1 is synthesised from THF, it crystallises as 1·THF. The solvent in 1·THF can be exchanged for a variety of other organic solvents, including in a stepwise fashion. The THF can also be exchanged for volatile solids such as iodine or pyrazine. If 1 is crystallised from a mixture of solvents, it shows a clear preference for inclusion of some solvents over others. [2]

The robust nature of framework 1 led us to investigate the construction of other frameworks based on the pamoate ion. The pamoate salt of 1,10-phenanthroline, 2, co-crystallises with various solvents to give a series of isostructural co-crystals of salt 2. Crystallisation of 2 from solvent mixtures shows selectivity for inclusion of DMA over other solvents. This selectivity is also observed when co-crystals of 2 are prepared mechanochemically. Our efforts to better understand the behaviour of these systems will be discussed.

[1] Wahl, H. et al. (2012) Chem. Commun., 48, 1775-1777.

[2] H. Wahl. (2014) PhD thesis, Stellenbosch University, Stellenbosch, South Africa.



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