Poster Presentation

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Towards continuous crystallisation of layered and disordered solid forms

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Crystallisation is a vital step in the manufacture of many pharmaceuticals and fine chemicals, producing solids in a form ideal for downstream processes. Unlike others, these industries have not kept pace with advances in continuous production and for centuries industrial crystallisation has operated as a batch process, relying heavily on stirred tank reactors which bring batch to batch variations and limited control over particle attributes. Continuous crystallisation can offer improved product quality, less waste and access to new products more efficiently. One such particle attribute is the presence of molecular disorder in crystalline materials where different ratios of disordered components may show different physical properties [1]. However, disorder can be difficult to control and characterise so has not to date been widely exploited for achieving optimised properties. Multi-component crystallisation can be used to encourage orientational disorder and layering within the crystal lattice by appropriate choice of co-former and by utilising the principles of crystal engineering. The research being presented aims to systematically study disordered and layered materials. Systems that exhibit these characteristics will be discussed structurally, together with results from transferring production of these materials from evaporative to cooling crystallisation, frequently a key first step in achieving crystallisation in a continuous flow environment. In addition, the structural attributes of the particles produced will be correlated with different physical properties such as solubility and compressibility [2].

[1] *S. R. Byrn, R. R. Pfeiffer, G. Stephenson et al., Chemistry of Materials, 1994, 6, 1148-1158,* ***[2]*** *A. Saleki-Gerhardt, C. Ahlneck and G. Zografi, et al, 1994, 101, 237-247*

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