## **Monitoring Polymorphic Transformations in Solution**

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Applying diffraction techniques to the study of crystallisation from solution is a way to study the process of crystallisation under different solvent conditions, supersaturation and cooling regimes. For polymorphs systems this approach provides a means to map the stability of one polymorph in relation to another during the crystallisation process in real time. An issue is the trade off between solid diffraction and solution scatter on the overall pattern obtained, and specifically the overall signal to noise.

Even using the light intensity from a synchtron the diffraction from the solid phases present, remains buried in thesignal due to the solution scattering the x-rays. A novel clarifying crystalliser has been developed which by virtue of the design forms a plume of solid for the beam to probe. Thereby increasing the weight fraction of solid pressnted to x-ray beam thus the overall signal to noise obtained from the solid present. To date the crystallisation of urea, citric acid, glutamic acid and piracetam has been studied using the cell on station 16.4 at the SRS Daresbury, and the outcome for these systems will be presented. These examples systems highlight how it has been possible to monitor the evolution of morphology, induction times and the rates of inter conversion from one polymorphs to another.

Keywords: polymorphism, insitu diffraction, crystal growth