



Solubility Data-Driven Workup Design & Crystallisation Development

CASE STUDY



The challenge

CatSci was tasked with designing a new bromination method for a key reaction intermediate. Use of bromine rendered the previous process unsuitable for a larger campaign and would require expensive and time-consuming alterations to the plant.



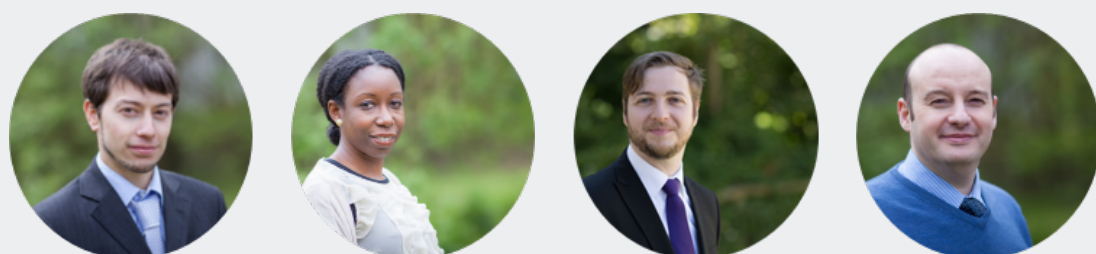
How?

Product solubility data, rapidly acquired on Crystal 16 apparatus in a variety of solvents and solvent mixtures, were used to design the isolation and workup by "starting with the end in mind."



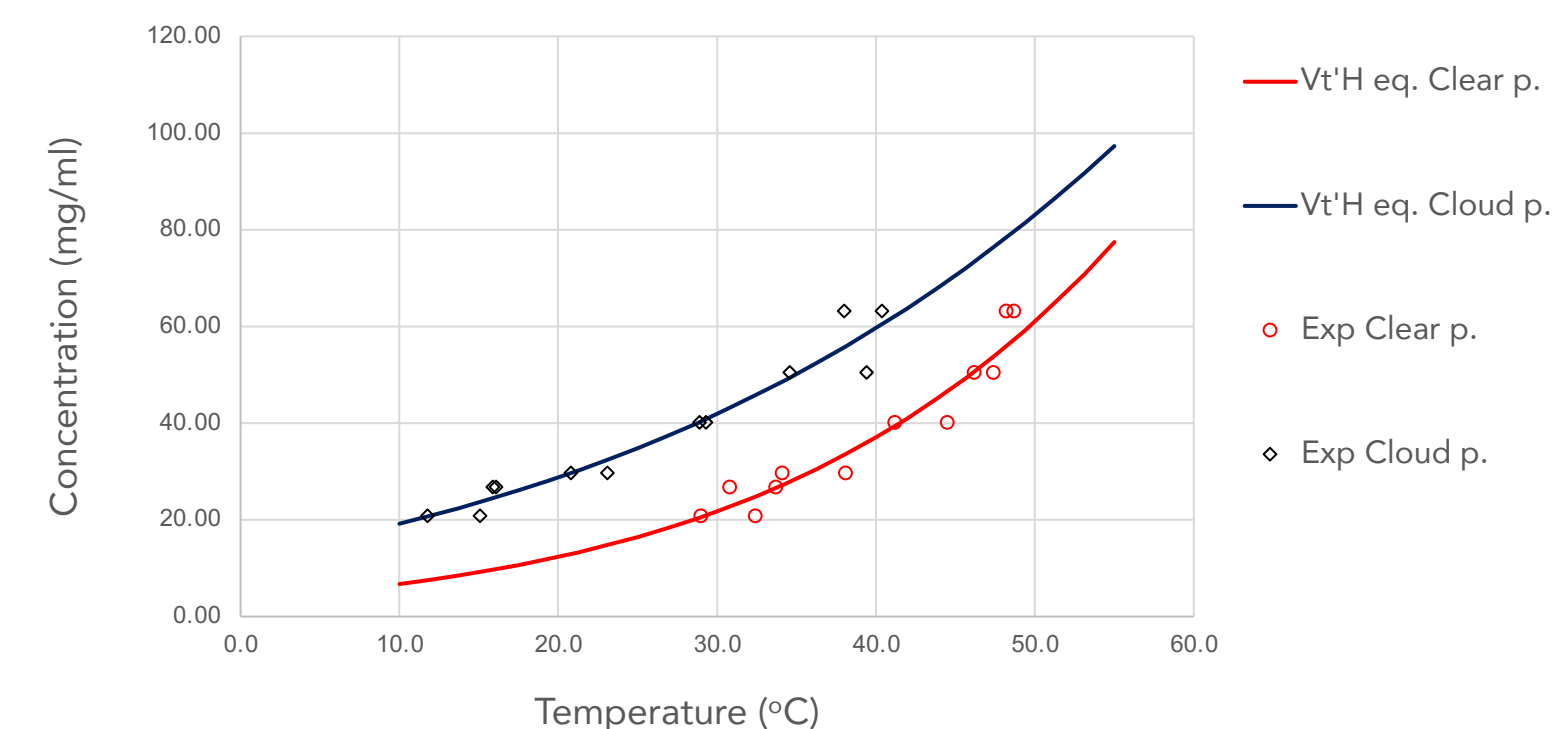
The achievement

The reaction volume and charge of caesium carbonate were halved. These modifications opened the way to a more concentrated water wash followed by an easy filtration. To provide assurance over control of levels of potentially Critical Quality Attributes, a low volume water/methanol cooling recrystallisation was developed. This gave an excellent recovery (85%) and product of high purity (>99% strength). This process intensification activity allowed CatSci to manufacture more than 10 kg of material with suitable quality and downstream performance attributes.



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Example of solubility study run on amination intermediate in H₂O/MeOH system



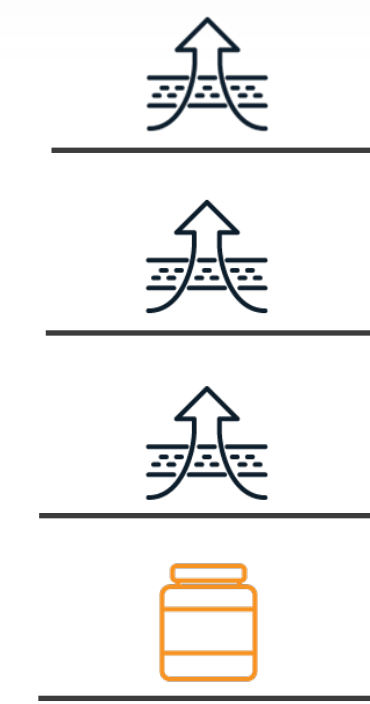
Old Process

> 70 RV of water used

Total process volume:
97 RV

Solvent swap to dioxane

No purification applied



New Process

Only 7 RV of water required

Total process volume:
20 RV

No solvent swap

Purity > 99% after
recrystallisation



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