Minimizing time spent investigating a speculative route

Introduction

It has become increasingly more common to have to consider more speculative route candidates for process development. Frequently, chemist's intuition suggests that a route candidate is unlikely to work, however, other alternative, and superior routes may not be apparent. More speculative work must be tried in order that the project can be progressed. It is vital that, in these circumstances, experimental time is managed wisely. This case study demonstrates how powerful the Amigo workstation, in combination with factorial design software is in addressing such PRD challenges.

Study details

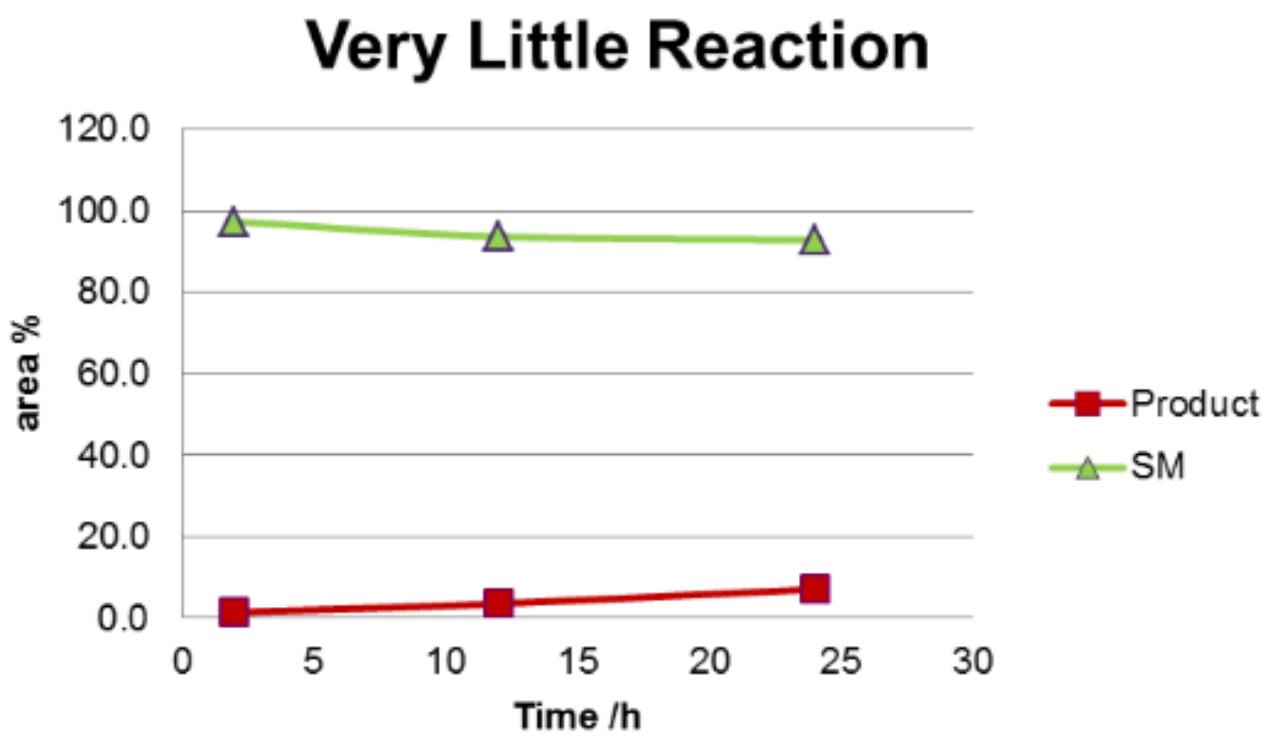
The Pharmaceutical company's intial study produced a 10% yield. Could this be optimised further?

A factorial design experiment was set up varying 4 factors (temperature, reagent charge, base charge and solvent volume) 10 x 75mg scale experiments were run in parallel using Amigo.

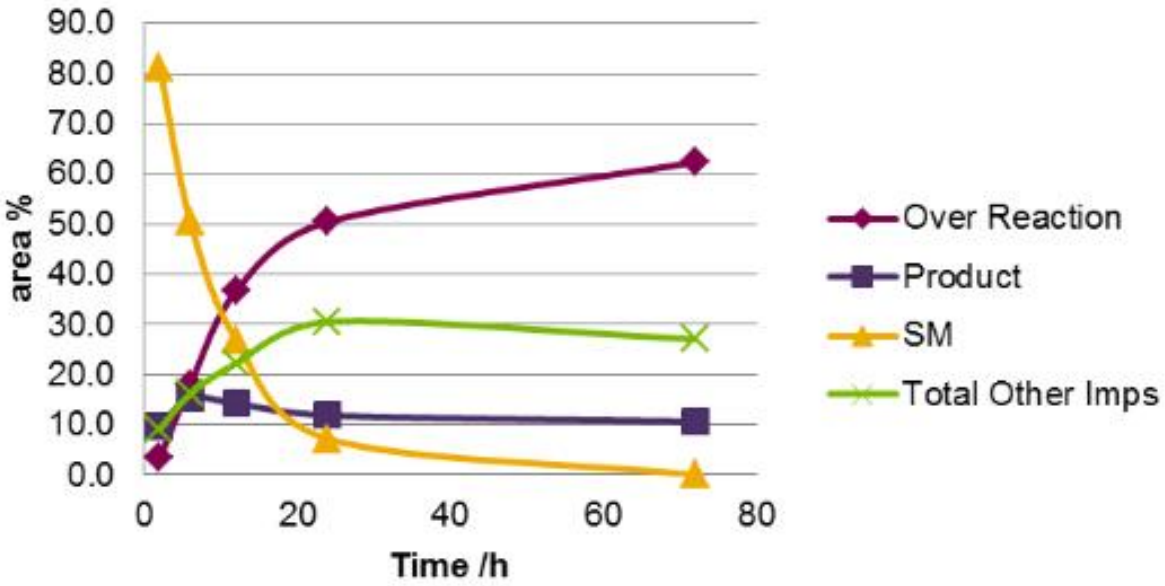
Data obtained from Amigo

A very large range of reaction data was observed.

from

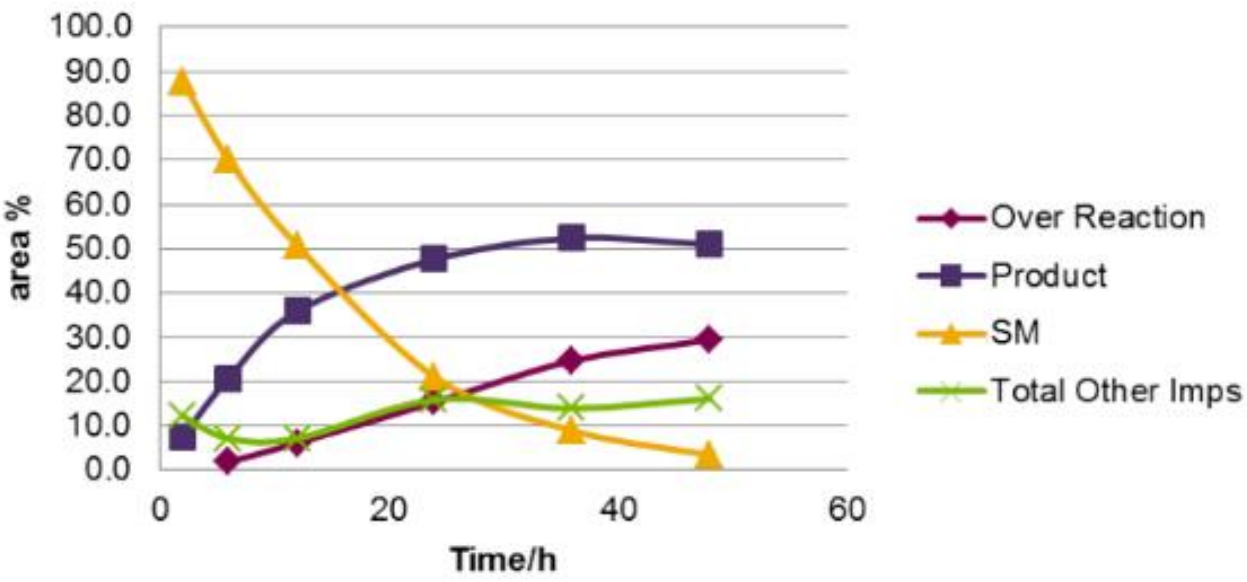


Complete Over-Reaction



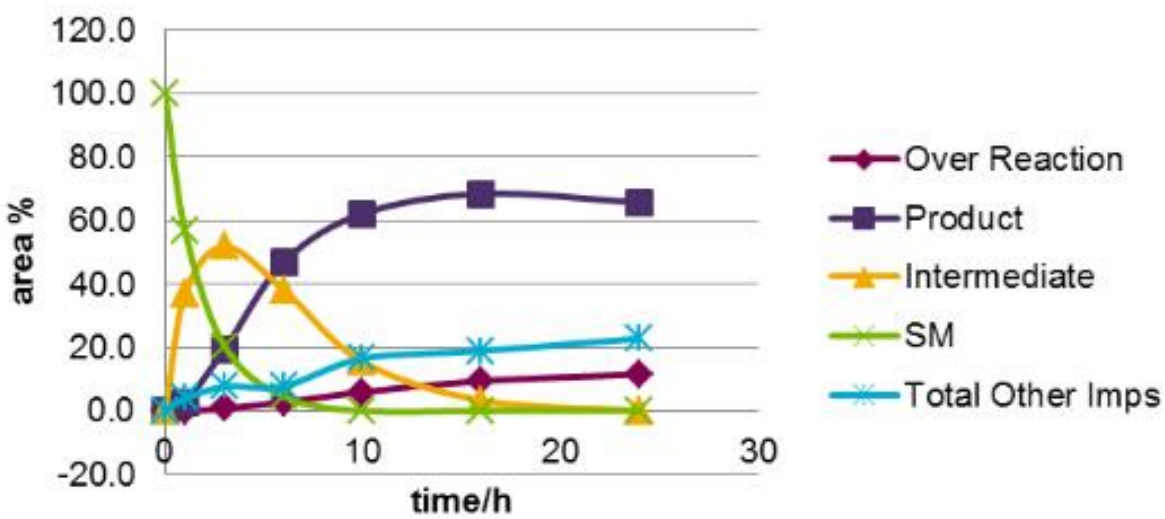
with the best data achieved

Best FED Reaction - 50% Product!



The FED generated excellent models that were used to optimise the process further

Optimised Reaction - 70% Product



Highlights

- **Total experimental time =1 week**
- **Total starting material used =1g (13 x 75mg)**
- **This new route has been selected for further development and scale up**