

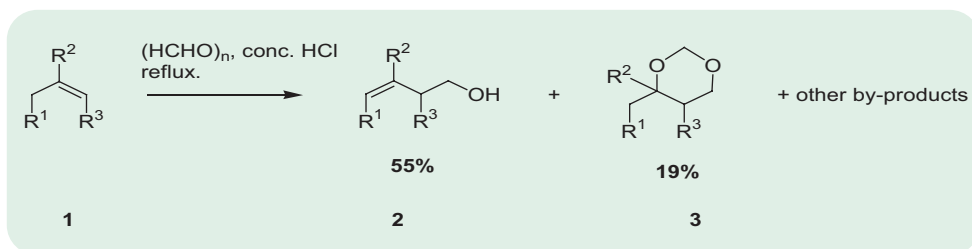
Case Study: Optimisation of an API process

Customer

Company A, a leading UK API manufacturer, was operating a Prins process to obtain homoallylic alcohol **2**, a vital precursor *en route* to one of their important APIs.

Problem

Homoallylic alcohol **2** was only produced in 55% yield and with a significant number of unknown by-products.



Solution

- Identities of significant by-products (notably dioxane **3**) were determined.
- Kinetic and simulation studies (using the customer's own data) suggested an equilibrium process governed by acid strength and formaldehyde excess.
- Lab experiments indicated varying formaldehyde and acid strength altered the proportion of dioxane **3** present, but the yield of **2** remained constant.
- It was concluded from this that **2**, **3** and the other by-products existed in equilibrium and hence that recycling the waste-stream after removal of **2** could allow re-equilibration to produce more **2**.

Output

After successful lab trials confirmed this, Company A plans to implement a scheme on plant to collect and re-react the waste stream to obtain more product **2**.

Annualised cost-savings are expected to be in excess of **£50,000**.

Company A's Site Chemist commented:

"I found the combination of practical organic chemistry knowledge and physical chemistry insight which LyraChem brings together to be very powerful.

LyraChem experts rapidly absorbed the background to our problem and we gained new insights into the workings of our process from the discussions which ensued.

LyraChem can add significant value in process scale up and optimisation."