



Flow Chemistry at Raybow

Raybow is pleased to highlight its efforts in implementing flow chemistry as part of Raybow's commitment to the principles of Green Chemistry. While flow chemistry is not a panacea for all chemical problems, it does play an increasingly important role as part of the "chemical tool kit" to solve a number of difficult chemical transformations, particularly those that require high pressures, cryogenic/high temperatures, highly energetic reactions and/or the use of toxic reagents which require specialized handling conditions. As such, the typical flow chemistry solution allows for efficient control in drastically minimizing hazard/safety issues, reducing solvent usage and decreasing generation of product waste streams, all of which makes it highly attractive from the Green Chemistry perspective.

Raybow has made the concomitant investment in the required state-of-the-art flow chemistry equipment (CorningAdvanced-Flow™ Reactors and proprietary equipment), a staff of highly trained chemists and the QA/QC groups to carry out cGMP flow chemistry operations.

Raybow has applied flow chemistry to a number of client projects, ranging from laboratory demonstration of proof-of-concept to full scale manufacture of MT quantities. One example is a scale-up of a Curtius rearrangement chemistry. While the alternative Hoffman chemistry could be used, this was deemed not acceptable due to higher costs and increased amounts of impurities in the product. Therefore, flow chemistry conditions were developed, demonstrated at kg scale and then successfully scaled up to manufacture 800 kgs of the desired product. Benefits compared to the original batch manufacturing process included higher yield, higher purity product and 60% reduction in waste streams generated which resulted in an overall 30% reduction in costs for this transformation.

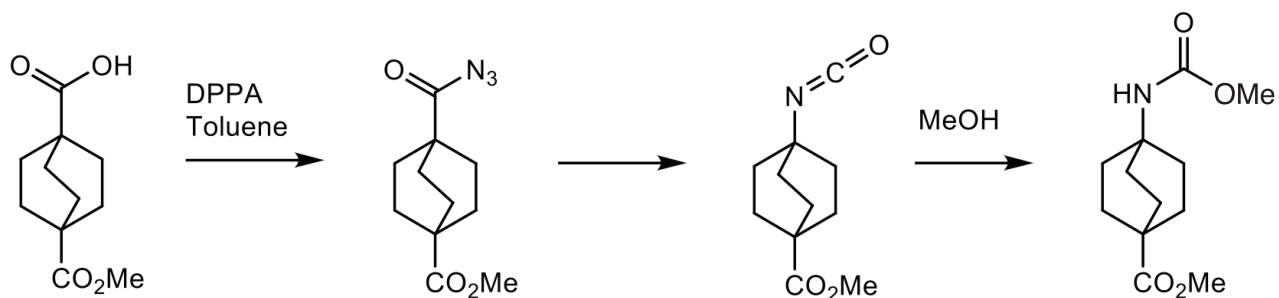
Raybow will be happy to discuss the potential applicability of flow chemistry for your chemistry needs.

Visit our website contact page to find up to date contact information for our global sales team.

www.raybow.com

Flow Chemistry Example

Curtius Rearrangement Reaction:



Large Scale Flow Chemistry Curtius Rearrangement Reaction Set-up (Throughput 230 Kg product/72 hours):

