Flow Synthesis Online - September 2012

We hope you've had a pleasant summer.

In this issue:

We look "under the hood" of the Vapourtec V-3 pump, (right) which is at the heart of the new E-Series flow chemistry system. Several of you have asked about the technology behind it, and here we describe how it works, and what it makes possible.

There are new application notes
- An example of solvent free (ie neat) synthesis, with throughput in excess of 400g/hr.
- O-Methylation of a carboxylic acid with TMS diazomethane

And of course recently released flow chemistry publications.

Enjoy !

New Product Development

The Vapourtec V-3 Pump

At the heart of the recently unveiled E-Series flow chemistry system is a revolutionary new pump, which has been specially developed for the range.

The V-3 pump comfortably pumps :

- strong acids
- suspensions
- moisture-sensitive reagents
- air and other gases

... all the while giving smooth continuous output

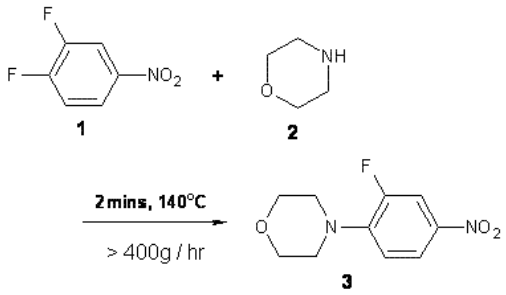
How does it work ?
What is it capable of ?

Click here to find out more

Application Notes

The following new application notes have recently been made available on the Vapourtec website.

Green, solvent free synthesis, solid product & > 400g / hour

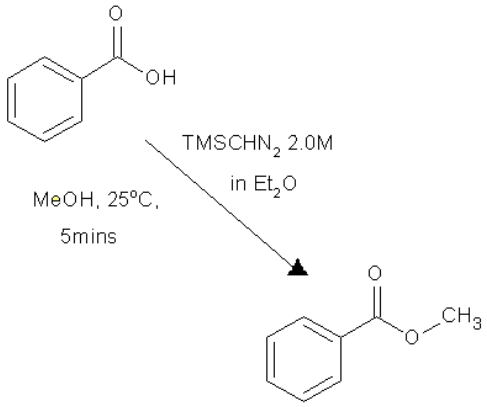


Once a reaction is optimised in flow, it is possible to scale up by repeating in a larger reactor (or several in series). Another way to get more throughput is to increase concentration, but this often runs into new challenges of solubility.

This application note shows a reaction performed solvent free, with novel use of equipment to ensure an insoluble solid product is continuously collected.

Go to the Vapourtec application note page

Continuous O-Methylation of Carboxylic Acids with Trimethylsilyldiazomethane



Diazomethane is valued for its reactivity and selectivity in a range of reactions, but working with it presents significant hazards, including the requirement for specially treated glassware to prevent explosions.

Trimethylsilyldiazomethane ($TMSCHN_2$) is reported as being less hazardous and more thermally stable in a number of applications.

This application note shows use of $TMSCHN_2$ for methylation of a carboxylic acid.

Go to the Vapourtec application note page

Events

1st Annual Biomolecular Systems Day - 12th October 2012, Berlin

Vapourtec will be exhibiting and presenting at this event at the Max Planck institute, Free Universitat, in Berlin

More details available shortly on the Vapourtec Events page

[Vapourtec Events Page]

LEGOMEDIC Launch Symposium - 21st January 2013, Belgium

LEGOMEDIC is a regionally funded consortium based on the partnership between various Belgian companies and academic groups, with expertise in synthetic chemistry, engineering, micromechanics and automation of industrial processes.

The LEGOMEDIC project concerns "Development and optimization of microreactors for the continuous flow manufacturing and purification of organic fine chemicals and biomolecules."

The project startup meeting will feature a selection of speakers and vendor displays.

[Click here to see details of the meeting]

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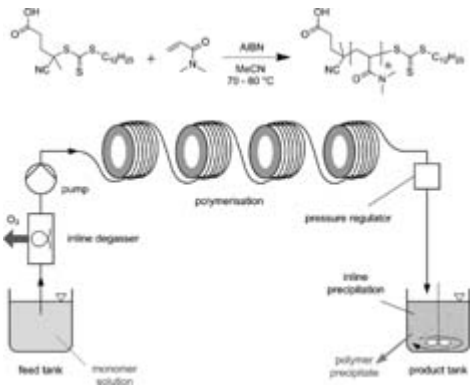
Publications

Integrated Continuous Processing and Flow Characterization of RAFT Polymerization in Tubular Flow Reactors



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Several unit operations are combined in series

to form an integrated, continuous polymerization process; namely inline degassing of monomer stock solution prior to reaction, polymerization using the RAFT approach and precipitation after reaction to form a solid polymeric product. The polymerization is conducted at 70–80 °C with reaction times of 30–90 min in a stainless steel tubular flow reactor, yielding poly(acrylamide) at high conversion (typically >90%) and with a low polydispersity of 1.14–1.23. The axial dispersion occurring inside the tubular flow reactor during polymerization is characterized by reaction profiling using a series of NMR samples. The process can be scaled up to a total output of 1.36 kg of polymer per day on this laboratory-scale reactor.

Click here to go straight to the publication

Synthesis of an H3 Antagonist via Sequential One-Pot Additions of a Magnesium Ate Complex and an Amine to a 1,4-Ketoester followed by Carbonyl-Directed Fluoride Addition

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Mark T. Maloney
Lulin Wei
Marcus Ewing
Stephen M. Chesnut
Joshua R. Denette
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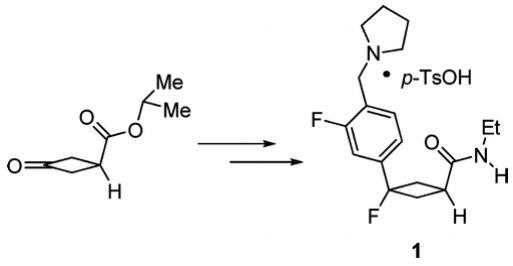

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We describe the development of an efficient and scalable process for the preparation of fluorocyclobutane-containing H3 antagonist, 1. The synthesis was accomplished by the chemoselective addition of a magnesium ate complex and an amine to a 1,4-ketoester in a one-pot sequence, followed by a diastereoselective carbonyl-directed fluorination. The chemoselective addition of the magnesium ate complex to the ketoester benefited from tight stoichiometric control, short addition times, and lower reaction temperatures, and thus was amenable to rapid mixing and excellent heat transfer in a flow reactor.

Click here to go straight to the publication

Technical articles are in PDF form. Publications may require a subscription to access.

See you in November.

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