

Welcome to the **Flow Synthesis Online** newsletter.

This publication is released bi-monthly and will showcase new applications, events, and equipment in the Flow Synthesis world.

There's clearly a lot of technology development going on in flow ! Below you can see Vapourtec's announcement of the first true nitration capable flow chemistry system. There are also links to a free webinar demonstrating Mettler Toledo's ReactIR™ flow cell and publications involving online HPLC (Merck) , and online phase separation (University of Cardiff).

Vapourtec sent this email to you because you have in the past expressed an interest in Vapourtec products. If you do not want to receive future issues of this newsletter, you may unsubscribe now by scrolling to the bottom of this email and clicking on the unsubscribe link. If you think a colleague may be interested, please feel free to forward it.

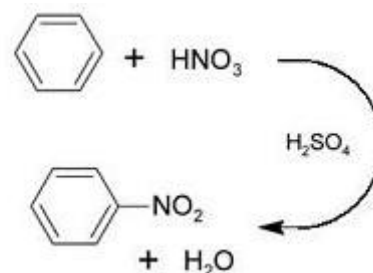
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## Product News

### Vapourtec System Now Ready For Real Nitrations !

The Vapourtec R Series system is now available in an acid resistant version, capable of using **fuming nitric acid** and **concentrated sulphuric acid** (among others). Safe, straightforward nitrations with easy scaleup are now possible.

In fact one user has demonstrated 50g/hr nitration with fuming nitric acid in the new system within 2 days of installation !



[Click here to read more](#)

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## Upcoming Events

### Free Webinar Showcasing the Mettler Toledo ReactIR™ flow cell.

On November 19th (at 3 different times) this device will be demonstrated. It is presented as a convenient inline analytical tool for continuous flow chemistry processing. The flow cell, operated with ATR technology, is attached inline using standard Omnifit® connections. With the established iC IR 4.0 software the consumption of reagents and formation of products can be monitored in real-time, allowing for rapid optimization. Unstable reactive intermediates can also be observed in situ, giving mechanistic insight to complex transformations.

Guest presenters include Professor Steven Ley, winner of the 2009 Tetrahedron Prize.

The device will be demonstrated with several flow systems, including the Vapourtec R Series

(used for a Curtius Rearrangement).

[Click here to find out more and register](#)

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## Publications

### **Optimizing the Deprotection of the Amine Protecting p-Methoxyphenyl Group in an Automated Microreactor Platform**

Kaspar Koch, Bram J. A. van Weerdenburg, Jorge M. M. Verkade, Pieter J. Nieuwland, Floris P. J. T. Rutjes\* and Jan C. M. van Hest\*

*Radboud University Nijmegen, Institute for Molecules and Materials, Heyendaalseweg 135, NL-6525 AJ Nijmegen, The Netherlands*

**Org. Process Res. Dev., 2009**

Three factors (temperature, stoichiometry and reaction temperature) were investigated in continuous flow microreactors in an automated fashion for optimization of the removal of the p-methoxyphenyl (PMP) protecting group, thereby consuming only minute amounts of substrate (0.2 mg/sample). The optimal reaction conditions were also applied to a larger microreactor system, in which the corresponding free amine was obtained at a preparative scale.

[Click here to go straight to the publication](#)

### **The Continuous-Flow Synthesis of Ibuprofen**

Andrew R. Bogdan <sup>2</sup>, Sarah L. Poe <sup>2</sup>, Daniel C. Kubis <sup>2</sup>, Steven J. Broadwater <sup>2</sup>, D. Tyler McQuade<sup>1</sup>

<sup>1</sup>*Department of Chemistry and Biochemistry, Florida State University, Chemical Sciences Laboratory, Tallahassee, FL 32306 (USA), Fax: (+1) 850-644-8281*

<sup>2</sup>*Department of Chemistry and Chemical Biology, Cornell University, Baker Laboratory, Ithaca, NY 14853 (USA)*

**Angewandte Chemie International Edition, 2009**

Let relief flow forth! A three-step, continuous-flow synthesis of ibuprofen was accomplished using a simplified microreactor. By designing a synthesis in which excess reagents and byproducts are compatible with downstream reactions, no intermediate purification or isolation steps are required.

[Click here to go straight to the publication](#)

### **Online Analysis of Flowing Streams Using Microflow HPLC**

Christopher J. Welch\*, Xiaoyi Gong\*, James Cuff, Sarah Dolman, Jason Nyrop, Fiona Lin and Hallena Rogers

*Separation and Purification Center of Excellence, Department of Process Research, Merck & Co., Inc., Rahway, New Jersey, U.S.A.*

### **Org. Process Res. Dev., 2009**

The application of a recently developed online HPLC reaction sampling instrument for monitoring flow chemistry reactions is described.

[Click here to go straight to the publication](#)

### **Flash Chemistry: Fast Organic Chemistry in Microsystems (Book review)**

Klaus F. Jensen  
*Massachusetts Institute of Technology*  
**J. Am. Chem. Soc., 2009**

"This book is a useful addition to the growing number of reviews on flow chemistry"

[Click here to go straight to the publication](#)

### **Liquid/liquid phase separation: characterisation of a novel device capable of separating particle carrying multiphase flows**

Oliver K. Castell, Christopher J. Allender and David A. Barrow  
*University Of Cardiff , UK*  
**Lab Chip, 2009**

Capillary forces on the microscale are exploited to create a continuous flow liquid-liquid phase separator. Segmented flow regimes of immiscible fluids are generated and subsequently separated into their component phases through an array of high aspect ratio, laser machined, separation ducts (36  $\mu\text{m}$  wide, 130  $\mu\text{m}$  deep) in a planar, integrated, polytetrafluoroethylene (PTFE) microdevice. A controlled pressure differential across the phase separator architecture facilitates the selective passage of the wetting, organic, phase through the separator ducts, enabling separation of microfluidic multiphase flow streams. The reported device is demonstrated to separate water and chloroform segmented flow regimes at flow rates up to 0.4 ml min<sup>-1</sup>.

[Click here to go straight to the publication](#)

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The technical articles above are in PDF form and may be immediately downloaded or read online. No registration is required. Enjoy !

Any 3rd Party publications referred to may require a subscription to download.

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### **About Vapourtec Ltd**

Vapourtec develop and manufacture the R Series Flow Chemistry Platform, the leading choice of industrial and academic users worldwide. To find out more about the R Series, or about Flow Chemistry generally, go to

<http://www.vapourtec.co.uk>

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