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# fullflow from Vapourtec

**Welcome to the summer 2021 issue of FullFlow, the flow chemistry newsletter from Vapourtec, a must-read for all scientists interested in continuous processing applications and technology.**

## Product News


### Flow electrochemistry for undergraduate teaching labs

Vapourtec is launching a flow electrochemistry teaching module. This new system is compact and easy-to-use to allow the teaching of the fundamentals of electrochemistry in continuous flow. The system includes a pump, galvanostat, and modular electrochemical reactor at a price point suitable for undergraduate teaching.


### Vapourtec to launch the easy-HC1O in-situ biocide system

The easy-HC10 uses Vapourtec's proven flow electrochemical reactor to convert water and salt into Hypochlorous acid immediately before spraying. Hypochlorous acid is a strong biocide effective against 99.9% of viruses. The innovative easy-HC10 provides a robust, efficient and convenient method for disinfecting public spaces.

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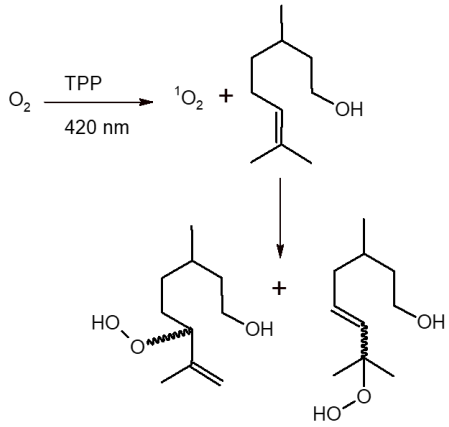
# Application Notes




## Application Note 71: Photochemistry – Process development and scale up to kilos / day

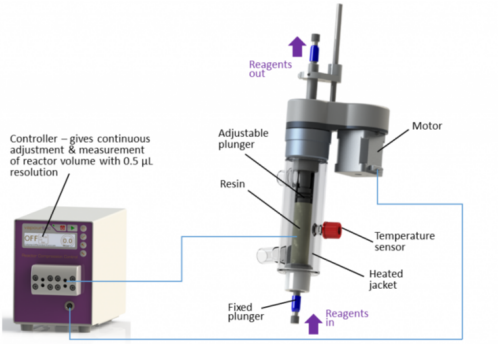
This application note demonstrates a 385% increase in throughput in the ene like reaction of singlet oxygen with citronellol, by increasing the photon flux. Using Vapourtec's UV-150 photochemical reactor equipped with a 420 nm High Power LED, a throughput of ~60 g/h (1.4 kg/day) is achieved.

Read more

## Application Note 70: Fast Stern-Volmer analysis in flow

This application note, prepared by the Vilela group at Heriot-Watt University, illustrates how a Vapourtec E-Series can be configured with a spectrophotometer for Stern-Volmer fluorescence quenching studies. The results obtained in both batch and flow highlight the benefits of the flow system over manual data collection for determining Stern-Volmer quenching rates.

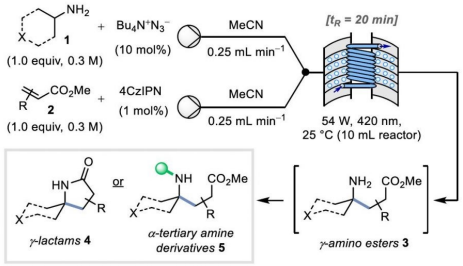
Read more




## Application Note 69: Automated CF-SPPS and evaluation of GLP-1 peptide

This application note illustrates the capabilities of a Vapourtec RS-400 system, equipped with a novel flow reactor, the Variable Bed Flow Reactor, for continuous flow Solid-Phase Peptide Synthesis. Glucagon-like peptide (GLP-1), a 30-mer peptide, its analogues used to treat diabetes, was chosen to show the advantages of the Variable Bed Flow Reactor. The use of the Variable Bed Flow Reactor not only reduces the amount of solvent and reagent required, but it also ensures a more efficient synthesis.

Read more




**Scheme 1 – Photocatalytic α-C–H alkylation of primary aliphatic amines [1]**

## Application Note 68: Photocatalytic Synthesis of γ-Lactams and α-Tertiary Amine Derivatives in Continuous Flow

This application note, prepared by the Cresswell group at Bath University, reports a simple and direct solution to the synthesis of γ-lactams 4 (incl. azaspirocycles) and α-tertiary amine derivatives 5. Using a cheap organic photocatalyst (4CzIPN) in combination with azide ion as a hydrogen atom transfer (HAT) catalyst, the α-C–H alkylation of aliphatic primary amines 1 with acrylate Michael acceptors 2 can be affected.

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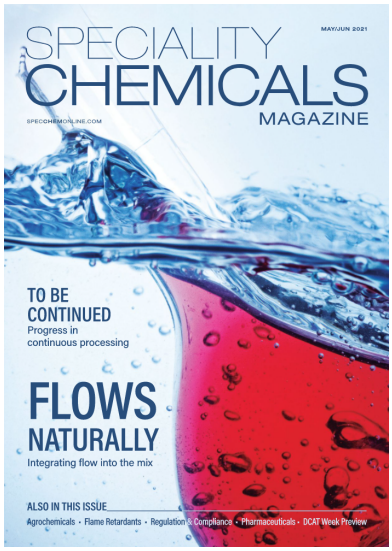
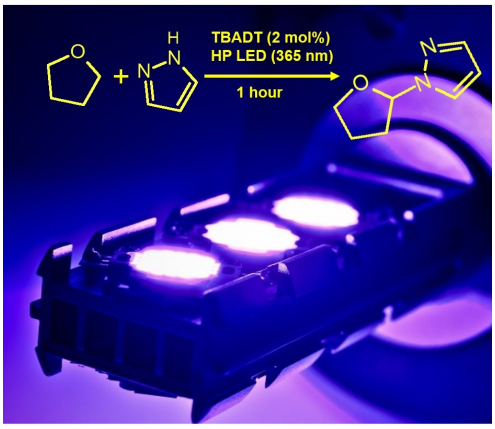
## *Latest News*




## Duncan Guthrie explores the history of continuous flow and how it shaped Vapourtec

Vapourtec's MD and founder discusses the history and future of continuous flow. in Speciality Chemicals Magazine. The article is entitled "A Journey from the Vapourtec Lab" and highlights key flow chemistry milestones and landmarks and how they've been reflected in Vapourtec's own development.

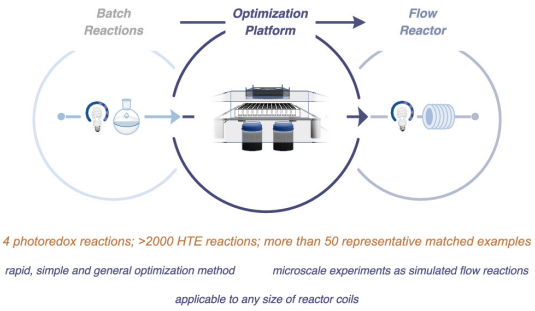
Read more




## The Noel Research Group harnesses the power of photons with Vapourtec

Angewandte Chemie has published the paper entitled "Decatungstate-mediated C(sp3)–H Heteroarylation via Radical-Polar Crossover in Batch and Flow", in which Prof Tim Noël, in collaboration with Eli Lilly and Vapourtec, describes a direct net-oxidative C(sp3)-H heteroarylation.

Read more




## Rapid optimization of photoredox reactions

## A clearer view for flow chemists

The paper entitled “Rapid Optimization of Photoredox Reactions for Continuous-Flow Systems Using Microscale Batch Technology”, was published in ACS Central Science. In this paper Prof Dave W. C. MacMillan, in collaboration with Eli Lilly, explored photoredox catalysis using a Vapourtec photochemical reactor.

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Vapourtec have launched a new, capacitive, touchscreen interface to complement the R-Series flow chemistry systems. This new interface includes a number of enhanced features which give scientists further improved control over their reactions and research.

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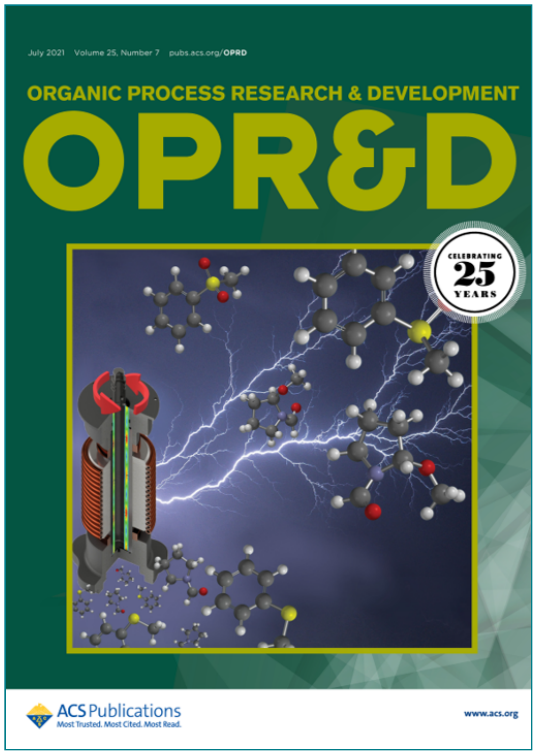
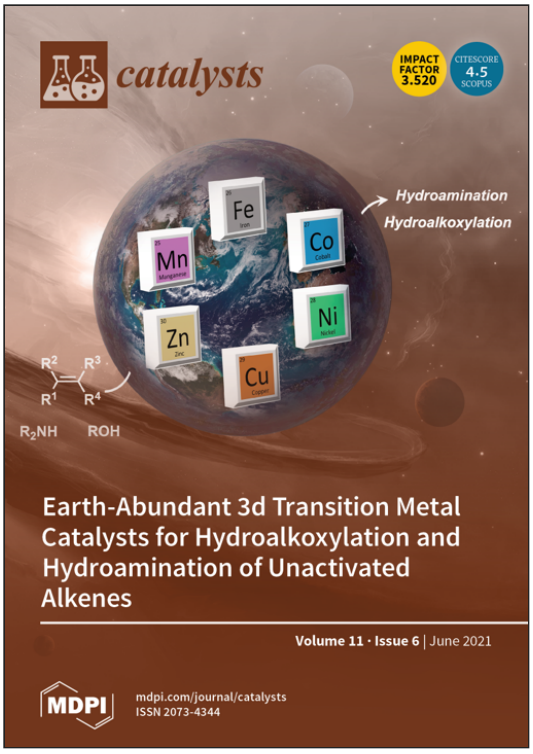
## Publications

**Below are 6 publications selected from the 100 published citing Vapourtec since last newsletter. To view a list of all publications citing Vapourtec click here.**




### Synthesis of Enantiopure Unnatural Amino Acids by Metallaphotoredox Catalysis




### Efficient Amino Donor Recycling in Amination Reactions: Development of a New Alanine Dehydrogenase

Tomer M. Faraggi[a], Caroline Rouget-Virbel[a], Juan A. Rincón[b], Mario Barberis[b], Carlos Mateos[b], Susana García-Cerrada[b], Javier Agejas[b], Oscar de Frutos[b] and David W. C. MacMillan[a]

[a]Merck Center for Catalysis at Princeton University, Princeton, New Jersey 08544, United States

[b]Centro de Investigación Eli Lilly, S. A. Avda de la Industria 30, Alcobendas-Madrid 28108, Spain

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## in Continuous Flow and Dialysis Membrane Reactors

David Roura Padrosa[a,b], Zoya Nisar[b] and Francesca Paradisi[a,b]

[a]Department of Chemistry and Biochemistry, University of Bern, Freiestrasse 3, 3012 Bern, Switzerland

[b]School of Chemistry, University of Nottingham, University Park, Nottingham NG7 2RD, UK

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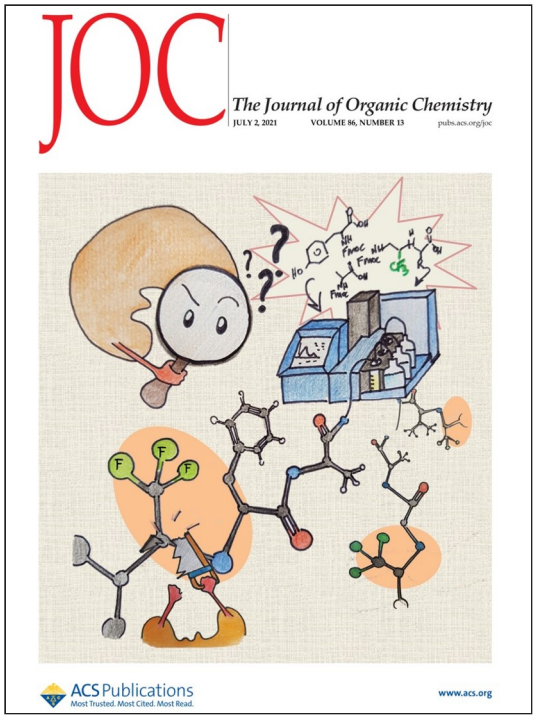


## Flow Electrosynthesis of Sulfoxides, Sulfones, and Sulfoximines without Supporting Electrolytes

Nasser Amri[a] and Thomas Wirth[a]

[a]School of Chemistry, Cardiff University, Main Building, Park Place, Cardiff CF10 3AT, United


## A continuous flow synthesis of [1.1.1]propellane and bicyclo[1.1.1]pentane derivatives

Kian Donnelly[a] and Marcus Baumann[a]

[a]School of Chemistry, University College Dublin, Science Centre South, Belfield, Ireland

Kingdom

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## Expanding the Tool Kit of Automated Flow Synthesis: Development of In-line Flash Chromatography Purification

Christopher G. Thomson[a], Colin Banks[b], Mark Allen[c], Graeme Barker[a,d], Christopher R. Coxon[a], Ai-Lan Lee[a] and Filipe Vilela[a,d]

[a]Institute of Chemical Sciences, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, Scotland EH14 4AS, United Kingdom

[b]Cheshire Sciences (UK) Limited, Kao Hockham Building, Edinburgh Way, Harlow, Essex, England CM20 2NQ, United Kingdom

[c]Advion (UK) Limited, Kao Hockham Building, Edinburgh Way, Harlow, Essex, England CM20 2NQ,

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## In situ sensors for flow reactors – a review

Jun Li[a], Helena Šimek[b], David Ilioae[c], Nicole Jung[b], Stefan Bräse[b], Hans Zappe[c], Roland Dittmeyer[a] and Bradley P. Ladewig[a]

[a]Institute for Micro Process Engineering (IMVT), Karlsruhe Institute of Technology (KIT), Hermann-von-Helmholtz-Platz 1, Eggenstein-Leopoldshafen, Germany

[b]Institute of Biological and Chemical Systems (IBCS-FMS), Karlsruhe Institute of Technology (KIT), Hermann-von-Helmholtz-Platz 1, Eggenstein-Leopoldshafen, Germany

[c]Gisela and Erwin Sick Laboratory for Micro-optics, Department of Microsystems Engineering, University of Freiburg, Germany

United Kingdom

[d]Continuum Flow Lab, Heriot-Watt University,

Edinburgh, Scotland EH14 4AS, United Kingdom

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