Highlights from the Flow Chemistry Literature 2016 (Part 1)

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In this Section of the journal, the literature on continuous flow synthesis (primarily organic synthesis and functional materials) from the period of January – March 2016 is presented. All the publications are listed ordered by journal name, with a Review article appearing at the end. In this quarter the number of papers on continuous flow organic synthesis is significantly higher than in the previous quarters. Also, the overall number of papers has increased by almost 30% as compared to any quarter in 2015. Let's hope that the trend continues throughout 2016!

1. Highlighted Articles

On-Demand Continuous-Flow Production of Pharmaceuticals in a Compact, Reconfigurable System

A. Adamo, R. L. Beingessner, M. Behnam, J. Chen, T. F. Jamison, K. F. Jensen, J.-C. M. Monbaliu, A. S. Myerson, E. M. Revalor, D. R. Snead

Science **2016**, *352*, 61–67

These authors have demonstrated a path breaking approach that leads to end-to-end synthesis of known active pharmaceutical ingredients (mainly hydrochlorides) and their formulation in a compact, reconfigurable manufacturing platform. This demonstration shows the path forward for decentralized pharmaceutical manufacturing through very neat integration of chemistry and robust engineering in a miniaturized form to achieve such a milestone in the science of chemical synthesis. The flexible plug-and-play approach including membrane separation for work-up would enable the advancement in several domains associated with flow synthesis with real-time formulation. This approach would also pose a real technology challenge for the generic versions of drugs and so would give a significant advantage to innovators of new molecules.

Life Cycle Assessment of Multi-Step Rufinamide Synthesis – from Isolated Reactions in Batch to Continuous Microreactor Networks

D. Ott, S. Borukhova, V. Hessel

Green Chemistry **2016**, *18*, 1096–1116

Interconnections between different synthesis steps with a feed-back in terms of different indices (viz. atom economy, efficiency, solvent quantity, etc.) that govern the efficacy of chemistry are used for implementation for life cycle analysis for the multi-step flow synthesis of rufinamide. Use of harsh conditions for achieving a difficult activation and the use of chlorides for azide formation is novel. This will have interesting implications when it comes to scale-up. The proposed end goal of the extensive analysis to identify the best fully continuous multi-reaction network, having uninterrupted flow from the first step until the end product is obtained is laudable.

The non-Aqueous Synthesis of Shape Controllable Cu 2− x S Plasmonic Nanostructures in a Continuous-Flow Millifluidic Chip for the Generation of Photo-Induced Heating

T.-L. Cheung, L. Hong, N. Rao et al.

Nanoscale **2016**, *8*, 6609–6622

Synthesis of copper sulfide nanocrystals with different shapes and sizes in a non-aqueous surfactant-free environment is reported. The shape and size selectivity are demonstrated by simply controlling the flow rates and precursor concentrations. It is an important contribution to the flow synthesis as from the same precursors the synthesis approach leads to formation of copper-deficient covellite (CuS), spionkopite ($Cu_{1.39}S$), roxbyite ($Cu_{1.75}S$) and copper-rich djurleite ($Cu_{1.94}S$).

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Synthesis of Nitro-Containing Compounds through Multistep Continuous Flow with Heterogeneous Catalysts

H. Ishitani, Y. Saito, T. Tsubogo, S. Kobayashi

Organic Letters **2016**, *18*, 1346–1349

Synthesis of β-nitrostyrene derivatives from aromatic aldehydes and nitromethane and their following reactions with heterogeneous catalysts is an interesting synthesis approach for the nitration chemistry. Use of amino-functionalized silica gel as a catalyst for synthesis of several derivatives for over 100 hr with high selectivity has been reported. In the second step, reactions of β-nitrostyrenes with solid bases, immobilized bases, solid acids, and chiral supported metals and nonmetals used as catalysts has resulted in a library of nitro-containing organic compounds. This achieves an almost no work-up approach which is always desired by the synthesis community at large.

Organic synthesis

"Solvent-Free Continuous Operations Using Small Footprint Reactors: A Key Approach for Process Intensification"
T. Ouchi, R. J. Mutton, V. Rojas, D. E. Fitzpatrick, D. G. Cork, C. Battilocchio, S. V. Ley
ACS Sustainable Chemistry & Engineering **2016**, *4*, 1912–1916

"A Review on Continuous-Flow Microfluidic PCR in Droplets: Advances, Challenges and Future"
Y. Zhang, H.-R. Jiang
Analytica Chimica Acta **2016**, *914*, 7–16

"Microfluidic Synthesis Enables Dense and Uniform Loading of Surfactant-Free PTSN Nanocrystals on Carbon Supports for Enhanced Ethanol Oxidation"
F. Wu, D. Zhang, M. Peng, Z. Yu, X. Wang, G. Guo, Y. Sun
Angewandte Chemie International Edition **2016**, *55*, 4952–4956

"Influence of High Power Ultrasound on Brettanomyces and Lactic Acid Bacteria in Wine in Continuous Flow Treatment"
L. Gracin, A. R. Jambrak, H. Juretić, S. Dobrović, I. Barukčić, M. Grozdanović, G. Smoljanić
Applied Acoustics **2016**, *103*, 143–147

"Three New Trixane Glycosides Obtained from the Leaves of Jungia Sellowii Less. Using Centrifugal Partition Chromatography"
Azevedo L, Faqueti L, Kritsanida M, et al.
Beilstein Journal of Organic Chemistry **2016***, 12, 674–683*

"Scope and Mechanism of the Highly Stereoselective Metal-Mediated Domino Aldol Reactions of Enolates with Aldehydes"
M. E. Cinar, B. Engelen, M. Panthöfer, H.-J. Deiseroth, J. Schlirf, M. Schmittel
Beilstein Journal of Organic Chemistry **2016**, *12*, 813–824

"Continuous Flow Negishi Cross-Couplings Employing Silica-Supported Pd-PEPPSI-Ipr Precatalyst"
G. A. Price, A. R. Bogdan, A. L. Aguirre, T. Iwai, S. W. Djuric, M. G. Organ
Catalysis Science & Technology **2016**, DOI: 10.1039/c6cy00331a

"Synthesis In Mesoreactors: Ru(Porphyrin)CO-Catalyzed Aziridination of Olefins under Continuous Flow Conditions"
S. Rossi, A. Puglisi, M. Benaglia, D. M. Carminati, D. Intrieri, E. Gallo E
Catalysis Science & Technology **2016**, DOI: 10.1039/C6CY00207B

"Continuous Flow Adsorption of Methylene Blue by Cellulose Nanocrystal-Alginate Hydrogel Beads in Fixed Bed Columns"
N. Mohammed, N. Grishkewich, H. A. Waeijen, R. M. Berry, K. C. Tam
Carbohydrate Polymers **2016**, *136*, 1194–1202

"Hydrodeoxygenation of Methyl Palmitate over MCM-41 Supported Nickel Phosphide Catalysts"
Q. Guan, F. Wan, F. Han, Z. Liu, W. Li
Catalysis Today **2016**, *259*, 467–473

"Scalable Synthesis of Palladium Icosahedra in Plug Reactors for the Production of Oxygen Reduction Reaction Catalysts"
H. Wang, G. Niu, M. Zhou, X. Wang, J. Park, S. Bao, M. Chi, Z. Cai, Y. Xia
ChemCatChem **2016**, *8*, 1658–1664

"Efficient Continuous Synthesis of High Purity Deep Eutectic Solvents by Twin Screw Extrusion"
D. Crawford, L. Wright, S. James, A. Abbott
Chemical Communications **2016**, *52*, 4215–4218

"Droplet Synthesis of Silver Nanoparticles by a Microfluidic Device"
L. Xu, J. Peng, M. Yan, D. Zhang, A. Q. Shen
Chemical Engineering and Processing: Process Intensification **2016**, *102*, 186–193

"Direct Photolysis of Benzoylecgonine under UV Irradiation at 254nm in a Continuous Flow Microcapillary Array Photoreactor"
D. Russo, D. Spasiano, M. Vaccaro, R. Andreozzi, G. L. Puma, N. M. Reis, R. Marotta X
Chemical Engineering Journal **2016**, *283*, 243–250

"Olive Mill Wastewater Valorisation through Phenolic Compounds Adsorption in a Continuous Flow Column"
D. Frascari, A. E. M. Bacca, F. Zama, L. Bertin, F. Fava, D. Pinelli
Chemical Engineering Journal **2016**, *283*, 293–303

"Utilization of Milli-Scale Coiled Flow Inverter in Combination with Phase Separator for Continuous Flow Liquid–Liquid Extraction Processes"
I. V. Gürsel, S. K. Kurt, J. Aalders, Q. Wang, T. Noël, K. D. Nigam, N. Kockmann, V. Hessel
Chemical Engineering Journal **2016**, *283*, 855–868

"Continuous Microreactor Synthesis of ZIF-8 with High Space–Time-Yield and Tunable Particle Size"
Polyzoidis, T. Altenburg, M. Schwarzer, S. Loebbecke, S. Kaskel
Chemical Engineering Journal **2016**, *283*, 971–977

"Microfluidic Synthesis of Monodispersed CDSE Quantum Dots Nanocrystals by Using Mixed Fatty Amines as Ligands"
Z.-H. Tian, J.-H. Xu, Y.-J. Wang, G.-S. Luo
Chemical Engineering Journal **2016**, *285*, 20–26

"Continuous Microfluidic Synthesis and Functionalization of Gold Nanorods"
L. Uson, V. Sebastian, M. Arruebo, J. Santamaria
Chemical Engineering Journal **2016**, *285*, 286–292

"Reaction Engineering Studies of the Continuous Synthesis of $Cuins_2$ and $Cuins_2$/Zns Nanocrystals"
S. Tian, M. Fu, W. Hoheisel, L. Mleczko
Chemical Engineering Journal **2016**, *289*, 365–373

"Design of Highly Selective Platinum Nanoparticle Catalysts for the Aerobic Oxidation of Ka-Oil Using Continuous-Flow Chemistry"
A. M. Gill, C. S. Hinde, R. K. Leary, M. E. Potter, A. Jouve, P. P. Wells, P. A. Midgley, J. M. Thomas, R. Raja
ChemSusChem **2016**, *9*, 417–417

"Scalability of Continuous Flow Production of Metal–Organic Frameworks"
M. Rubio-Martinez, T. D. Hadley, M. P. Batten, K. Constanti-Carey, T. Barton, D. Marley, A. Mönch, K. S. Lim, M. R. Hill
ChemSusChem **2016**, *9*, 938–941

"The Generation of a Library of Bromodomain-Containing Protein Modulators Expedited by Continuous Flow Synthesis"
P. Filipponi, I. R. Baxendale
European Journal of Organic Chemistry **2016**, 2000–2012

"An Efficient Continuous Flow Process for the Synthesis of a non-Conventional Mixture of Fructooligosaccharides"
P. Zambelli, L. Tamborini, S. Cazzamalli, A. Pinto, S. Arioli, S. Balzaretti, F. J. Plou, L. Fernandez-Arrojo, F. Molinari, P. Conti
Food Chemistry **2016**, *1*, 607–613

"Life Cycle Assessment of Multi-Step Rufinamide Synthesis – From Isolated Reactions in Batch to Continuous Microreactor Networks"
D. Ott, S. Borukhova S, V. Hessel
Green Chemistry **2016**, 18, 1096–1116

"The Synthesis of Di-Carboxylate Esters Using Continuous Flow Vortex Fluidics"
J. Britton, S. B. Dalziel, C. L. Raston
Green Chemistry **2016**, *18*, 2193–2200

"Synthesis and Textural Characterization of Mesoporous and Meso-/Macroporous Silica Monoliths Obtained by Spinodal Decomposition"
A. Galarneau, Z. Abid, B. Said, Y. Didi, K. Szymanska, A. Jarzębski, F. Tancret, H. Hamaizi, A. Bengueddach, F. Di Renzo
Inorganics **2016**, *4*, 9

"Microfluidic Biocatalysis Enhances the Esterification of Caffeic Acid and Methanol Under Continuous-Flow Conditions"
S. S. Wang, Z. J. Li, S. Sheng, F. A. Wu, J. Wang
Journal of Chemical Technology and Biotechnology **2016**, *91*, 555–562

"Isolation, Characterization and Evaluation of Photochemical Potential of Rice Husk-Based Furfural via Continuous Flow Reactor"
H. Nsubuga, C. Basheer, H. A. S. Al-Muallem, A. N. Kalanthoden
Journal of Environmental Chemical Engineering **2016**, *4*, 857–863

"Artificial Fluorogenic Substrates in Microfluidic Devices for Bacterial Diagnostics in Biotechnology"
C. E. M. Krämer, W. Wiechert, D. Kohlheyer
Journal of Flow Chemistry **2016**, *6*, 3–7

"Continuous-Flow Biochemical Reactors: Biocatalysis, Bioconversion, and Bioanalytical Applications Utilizing Immobilized Microfluidic Enzyme Reactors"
L. Hajba, A. Guttman
Journal of Flow Chemistry **2016**, *6*, 8–12

"Application of Enzyme-Immobilization Technique for Microflow Reactor"
H. Yamaguchi, T. Honda, M. Miyazaki
Journal of Flow Chemistry **2016**, *6*, 13–17

"A Microfluidic Toolbox for the Development if In-Situ Product Removal Strategies in Biocatalysis"
S. Heintz, A. Mitic, R. H. Ringborg, U. Krühne, J. M. Woodley, K. V. Gernaey
Journal of Flow Chemistry **2016**, *6*, 18–26

"NADH Oxidation in a Microreactor with an Oscillating Magnetic Field"
A. S. Katarina, P. G. Hojnik, P. Nikolina, N. Maja, L. B. Zelić
Journal of Flow Chemistry **2016**, *6*, 27–32

"Continuous Lipase B-Catalyzed Isoamyl Acetate Synthesis in a Two-Liquid Phase System Using Corning® AFR™ Module Coupled with a Membrane Separator Enabling Biocatalyst Recycle"
U. Novak, D. Lavric, P. Žnidaršič-Plazl
Journal of Flow Chemistry **2016**, *6*, 33–38

"Catalytic Pseudomonas Taiwanensis VLB120ΔC Biofilms Thrive in a Continuous Pure Styrene Generated by Multiphasic Segmented Flow in a Capillary Microreactor"
B. Halan, R. Karande, K. Buehler, A. Schmid
Journal of Flow Chemistry **2016**, *6*, 39–42

"Microfluidic Multiple Cell Chip Reactor Filled with Enzyme-Coated Magnetic Nanoparticles — An Efficient and Flexible Novel Tool for Enzyme Catalyzed Biotransformations"
F. Ender, D. Weiser, B. Nagy, C. László, B. Csaba, P. Pálovics, L. Poppe
Journal of Flow Chemistry **2016**, *6*, 43–52

"Characterization of Microchannel Hemodialyzers Using Residence Time Distribution Analysis"
M. Coblyn, A. Truszkowska, G. Jovanovic
Journal of Flow Chemistry **2016**, *6*, 53–61

"Magnetic Catalysts as Nanoactuators to Achieve Simultaneous Momentum-Transfer and Continuous-Flow Hydrogen Production"
Y. Liu, J. Zhang, X. Zhang, B. Li, X. Wang, H. Cao, D. Wei, Z. Zhou, A. K. Cheetham
Journal of Materials Chemistry **2016**, *4*, 4280–4287

"Development of a Novel Process to Mitigate Membrane Fouling in a Continuous Sludge System by Seeding Aerobic Granules at Pilot Plant"
M. Sajjad, I. S. Kim, K. S. Kim
Journal of Membrane Science **2016**, *497*, 90–98

"Selective Catalytic Oxidation of Benzene over Cu/Ti/HZSM-5 under Low Oxygen Pressure for One Step Synthesis of Phenol"
A. Okemoto, Y.-h. Tsukano, A. Utsunomiya, K. Taniya, Y. Ichihashi, S. Nishiyama
Journal of Molecular Catalysis A: Chemical **2016**, *411*, 372–376

"Ultrafine Palladium Nanoparticles Immobilized into Poly (4-Vinylpyridine)-Based Porous Monolith for Continuous-Flow Mizoroki–Heck Reaction"
R. P. Jumde, M. Marelli, N. Scotti, A. Mandoli, R. Psaro, C. Evangelisti
Journal of Molecular Catalysis A: Chemical **2016**, *414*, 55–61

"Increased Cyclic Guanosine Monophosphate Levels and Continuous-Flow Left-Ventricular Assist Devices: Implications for Gastrointestinal Bleeding"
L. Grosman-Rimon, L. C. Tumiati, A. Fuks, I. Jacobs, S. D. Lalonde, D. Z. Cherney, V. Rao
The Journal of Thoracic and Cardiovascular Surgery **2016**, *151*, 219–227

"Pilot Plant Scale Continuous Hydrothermal Synthesis of Nano-Titania; Effect of Size on Photocatalytic Activity"
N. M. Makwana, C. J. Tighe, R. I. Gruar, P. F. McMillan, J. A. Darr
Materials Science in Semiconductor Processing **2016**, *42*, 131–137

"Continuous Flow Photochemistry as an Enabling Synthetic Technology: Synthesis of Substituted-6(5H)-Phenanthridinones for Use as Poly(ADP-Ribose) Polymerase Inhibitors"
Y. Fang, G.K. Tranmer
MedChemComm **2016**, *7*, 720–724

"Correction: Continuous Flow Photochemistry as an Enabling Synthetic Technology: Synthesis Of Substituted-6 (5 H)-Phenanthridinones for Use as Poly (ADP-Ribose) Polymerase Inhibitors"
Y. Fang, G. Tranmer
MedChemComm **2016**, *7*, 732–732

"Facile Preparation of Uio-66 Nanoparticles with Tunable Sizes in a Continuous Flow Microreactor and Its Application in Drug Delivery"
S. Tai, W. Zhang, J. Zhang, G. Luo, Y. Jia, M. Deng, Y. Ling
Microporous and Mesoporous Materials **2016**, *220*, 148–154

"Continuous-Flow Synthesis of Deuterium-Labeled Antidiabetic Chalcones: Studies towards the Selective Deuteration of the Alkynone Core"
S. B. Ötvös, C.-T. Hsieh, Y.-C. Wu, J.-H. Li, F.-R. Chang, F. Fülöp
Molecules **2016**, *21*, 318

"Influence of Butanol Isomers on the Reactivity of Cellulose towards the Synthesis of Butyl Levulinates Catalyzed by Liquid and Solid Acid Catalysts"
A. Démolis, M. Eternot, N. Essayem, F. Rataboul
New Journal of Chemistry **2016**, *40*, 3747–3754

"Continuous Flow Magnesiation or Zincation of Acrylonitriles, Acrylates, and Nitroolefins. Application to the Synthesis of Butenolides"
M. A. Ganiek, M. R. Becker, M. Ketels, P. Knochel
Organic Letters **2016**, *18*, 828–831

"Short Flow-Photochemistry Enabled Synthesis of the Cytotoxic Lactone (+)-Goniofufurone"
M. Ralph, S. Ng, K. I. Booker-Milburn
Organic Letters **2016**, *18*, 968–971

"Generation and Synthetic Application of Trifluoromethyl Diazomethane Utilizing Continuous Flow Technologies"
B. U. Pieber, C. O. Kappe
Organic Letters **2016**, *18*, 1076–1079

"Synthesis of Nitro-Containing Compounds through Multistep Continuous Flow with Heterogeneous Catalysts"
H. Ishitani, Y. Saito, T. Tsubogo, S. Kobayashi
Organic Letters **2016**, *18*, 1346–1349

"Continuous Flow Zincations of Functionalized Arenes and Heteroarenes Using $(Cy_2N)_2Zn_2LiCl$"
M. R. Becker, P. Knochel
Organic Letters **2016**, *18*, 1462–1465

"High-Temperature Boc Deprotection in Flow and Its Application in Multistep Reaction Sequences"
A. R. Bogdan, M. Charaschanya, A. W. Dombrowski, Y. Wang, S. W. Djuric
Organic Letters **2016**, *18*, 1732–1735

"Asymmetric Synthesis of N-Boc-(R)-Silaproline via Rh-Catalyzed Intramolecular Hydrosilylation of Dehydroalanine and Continuous Flow N-Alkylation"
J. Y. Chung, M. Shevlin, A. Klapars, M. Journet
Organic Letters **2016**, *18*, 1812–1815

"Difluorocarbene Addition to Alkenes and Alkynes in Continuous Flow"
P. Rullière, P. Cyr, A. B. Charette
Organic Letters **2016**, *18*, 1988–1991

"Continuous-Flow Process for Selective Mononitration of 1-Methyl-4-(Methylsulfonyl) Benzene"
Z. Yu, P. Zhou, J. Liu, W. Wang, C. Yu, W. Su
Organic Process Research & Development **2016**, *20*, 199–203

"Development of an Intermittent-Flow Enantioselective Aza-Henry Reaction Using an Arylnitromethane and Homogeneous Brønsted Acid–Base Catalyst with Recycle"
S. V. Tsukanov, M. D. Johnson, S. A. May et al.
Organic Process Research & Development **2016**, *20*, 215–226

"The Use of Gases in Flow Synthesis"
C. J. Mallia, I. R. Baxendale
Organic Process Research & Development **2016**, *20*, 327–360

"Controlled Flow Precipitation as a Valuable Tool for Synthesis"
P. Filipponi, A. Gioiello, I. R. Baxendale
Organic Process Research & Development **2016**, *20*, 371–375

"Selective Olefin Reduction Using Hydrazine Hydrate and O_2 under Intensified Continuous Flow Conditions"
B. Pieber, D. P. Cox, C. O. Kappe
Organic Process Research & Development **2016**, *20*, 376–385

"Toward the Waste-Free Synthesis of Fine Chemicals with Visible Light"
R. Ciriminna, R. Delisi, Y.-J. Xu, M. Pagliaro
Organic Process Research & Development **2016**, *20*, 403–408

"Rapid and Scalable Access into Strained Scaffolds through Continuous Flow Photochemistry"
D. Blanco-Ania, S. A. Gawade, L. J. L. Zwinkels et al.
Organic Process Research & Development **2016**, *20*, 409–413

"Microwave Promoted Transcarbamylation Reaction of Sulfonylcarbamates under Continuous-Flow Conditions"
I. Kumpiņa, R. Isaksson, J. Sävmarker, J. Wannberg, M. Larhed
Organic Process Research & Development **2016**, *20*, 440–445

"Selective Hydrogenation of Halogenated Nitroaromatics to Haloanilines in Batch and Flow"
P. Loos, H. Alex, J. Hassfeld et al.
Organic Process Research & Development **2016**, *20*, 452–464

"Dispersion in Compartmentalized Flow Systems: Influence of Flow Patterns on Reactivity"
N. Hawbaker, E. Wittgrove, B. Christensen, N. Sach, D. G. Blackmond
Organic Process Research & Development **2016**, *20*, 465–473

"Experience with Scale-up of Low-Temperature Organometallic Reactions in Continuous Flow"
S. Laue, V. Haverkamp, L. Mleczko
Organic Process Research & Development **2016**, *20*, 480–486

"Toward a Large-Scale Approach to Milnacipran Analogues Using Diazo Compounds in Flow Chemistry"
S. T. R. Müller, A. Murat, P. Hellier, T. Wirth T.
Organic Process Research & Development **2016**, *20*, 495–502

"Application of Continuous Flow for DIBAL-H Reduction and N-Buli Mediated Coupling Reaction in the Synthesis of Eribulin Mesylate"
T. Fukuyama, H. Chiba, H. Kuroda, T. Takigawa, A. Kayano, K. Tagami
Organic Process Research & Development **2016**, *20*, 503–509

"Intelligent Continuous Collection Device for High-Pressure Flow Synthesis: Design and Implementation"
M. Tilley, G. Li, P. Savel, D. Mallik, M. G.
Organ, Organic Process Research & Development **2016**, *20*, 517–524

"A Continuous Process for Buchwald–Hartwig Amination at Micro-, Lab-, and Mesoscale Using a Novel Reactor Concept"
S. Falß, G. Tomaiuolo, A. Perazzo et al.
Organic Process Research & Development **2016**, *20*, 558–567

"Hydrogen Chloride Gas in Solvent-Free Continuous Conversion of Alcohols to Chlorides in Microflow"
S. Borukhova, T. Noel, V. Hessel
Organic Process Research & Development **2016**, *20*, 568–573

"Design of a Numbering-up System of Monolithic Microreactors and Its Application to Synthesis of a Key Intermediate of Valsartan"
A. Nagaki, K. Hirose, O. Tonomura, S. Taniguchi, T. Taga, S. Hasebe, N. Ishizuka, J.-i. Yoshida
Organic Process Research & Development **2016**, *20*, 687–691

"Continuous Flow Process for the Synthesis of M-Nitrothioanisole"
Z. Yu, X. Xie, H. Dong, J. Liu, W. Su
Organic Process Research & Development **2016**, *20*, 774–779

"Palladium-Catalyzed Aerobic Oxidative Coupling of O-Xylene in Flow: A Safe and Scalable Protocol for Cross-Dehydrogenative Coupling"
N. Erdmann, Y. Su, B. Bosmans, V. Hessel, T. Noël
Organic Process Research & Development **2016**, *20*, 831–835

"Organocatalyzed Continuous Flow Ring-Opening Polymerizations to Homo- and Block-Polylactones"
N. Zhu, W. Feng, X. Hu, Z. Zhang, Z. Fang, K. Zhang, Z. Li, K. Guo
Polymer **2016**, *84*, 391–397

"A Multistep Continuous Flow Synthesis Machine for the Preparation of Pyrazoles via a Metal-Free Amine-Redox Process"
J.-S. Poh, D. L. Browne, S. V. Ley
Reaction Chemistry & Engineering **2016**, *1*, 101–105

"Continuous Flow Buchwald-Hartwig Amination of a Pharmaceutical Intermediate"
P. Yaseneva, P. Hodgson, J. Zakrzewski, S. Falß, R. E. Meadows, A. A. Lapkin
Reaction Chemistry & Engineering **2016**, *1*, 229–238

Exploiting Photooxygenations Mediated by Porphyrinoid Photocatalysts under Continuous Flow Conditions
K. T. de Oliveira, L. Z. Miller, D. T. McQuade
RSC Advances **2016**, *6*, 12717–12725

"An Innovation for Development of Erlenmeyer–Plöchl Reaction and Synthesis of AT-130 Analogous: A New Application of Continuous-Flow Method"
B. Shafiee, L. Hadian, A. R. Khosropourm
RSC Advances **2016**, *6*, 19861–19866

"A Two-Step Continuous Synthesis of A-Ketoamides and A-Amino Ketones from 2° Benzylic Alcohols Using Hydrogen Peroxide as an Economic and Benign Oxidant"
C. Liu, Z. Fang, Z. Yang, Q. Li, S. Guo, K. Guo
RSC Advances **2016**, *6*, 25167–25172

"On-Demand Continuous-Flow Production of Pharmaceuticals in a Compact, Reconfigurable System"
A. Adamo, R. L. Beingessner, M. Behnam, J. Chen, T. F. Jamison, K. F. Jensen, J.-C. M. Monbaliu, A. S. Myerson, E. M. Revalor, D. R. Snead
Science **2016**, *352*, 61–67

"Spray and Inkjet Fabrication of Cu_2ZnSnS_4 Thin Films Using Nanoparticles Derived from a Continuous-Flow Microwave-Assisted Synthesis"
T. Martini, C. Chubilleau, O. Poncelet, A. Ricaud, A. Blayo, C. Martin, K. Tarasov
Solar Energy Materials and Solar Cells **2016**, *144*, 657–663

"Continuous-Flow Synthesis of 2H-Azirines and Their Diastereo Selective Transformation to Aziridines"
M. Baumann, I. R. Baxendale
Synlett **2016**, *27*, 159–163

"Preparation of Grignard Reagents from Magnesium Metal under Continuous Flow Conditions and On-Line Monitoring by NMR Spectroscopy"
M. Goldbach, E. Danieli, J. Perlo, B. Kaptein, V. M. Litvinov, B. Blümich, F. Casanova, A. L. Duchateau
Tetrahedron Letters **2016**, *57*, 122–125

"The Solid Copper-Mediated C–N Cross-Coupling of Phenylboronic Acids under Continuous Flow Conditions"
J. Bao, G. K. Tranmer
Tetrahedron Letters **2016**, *57*, 654–657

Polymer Monolith-Supported Dirhodium(II)-Catalyzed Continuous Flow Cyclopropanation in Capillary Format"
F. G. Adly, A. Ghanem
Tetrahedron Letters **2016**, *57*, 852–857

"Nucleophilic Aromatic Substitution of Heterocycles Using a High-Temperature and High-Pressure Flow Reactor"
M. Charaschanya, A. R. Bogdan, Y. Wang, S. W. Djuric
Tetrahedron Letters **2016**, *57*, 1035–1039

"Continuous Synthesis of Ginkgolide B Derivatives in a Micro-Flow System"
Y. Qin, W. He, M. Su et al.,
Tetrahedron Letters **2016**, *57*, 1243–1246

"Highly Efficient Biphasic Ozonolysis of Alkenes Using a High-Throughput Film-Shear Flow Reactor"
A. J. Kendall, J. T. Barry, D. T. Seidenkranz et al.
Tetrahedron Letters **2016**, *57*, 1342–1345

"Preparation of Vinyl Ethers Using a Wittig Approach, and Their Subsequent Hydrogenation Employing Continuous-Flow Processing"
M. Balti, M. L. Efrit, N. E. Leadbeater
Tetrahedron Letters **2016**, *57*, 1804–1806

Nanomaterials

"Core–Shell Nanoparticles by Silica Coating of Metal Oxides in a Dual-Stage Hydrothermal Flow Reactor"
H. Hellstern, A. Mamakhel, M. Bremholm, B. B. Iversen
Chemical Communications **2016**, *52*, 3434–3437

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