

Highlights from the Flow Chemistry Literature 2011 (Part 3)

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In this section of the journal, the continuous flow chemistry literature of the preceding months is presented. The first part for the year 2012 includes articles published in the last 3 months of 2011. Some key examples are highlighted in the form of graphical abstracts. The remaining publications in the field are then listed grouped by journal name, with review articles grouped at the end.

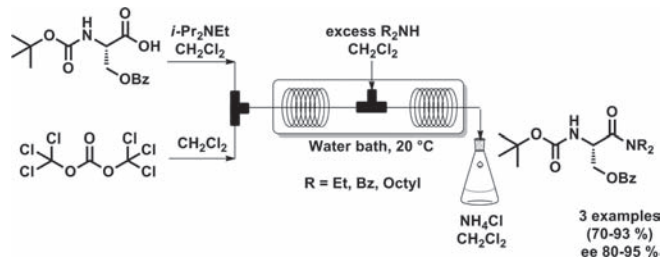
13/2011

Continuous *in situ* Generation and Reaction of Phosgene in a Microflow System

Shichiro Fuse, Nobutake Tanabe, Takashi Takahashi*

Chem. Commun. **2011**, 47, 12661–12663 DOI: 10.1039/c1cc15662d

In situ generation of phosgene and its immediate use for acid chloride formation are described. Triphosgene is used as source for the generation of phosgene. The formed acid chlorides are reacted with an excess of a nucleophile (amines) to form amides and also quench the excess of phosgene. A final reaction quench is assured by the use of an NH_4Cl solution in the receiving vial. This method also gave somewhat superior *ee* distributions as compared to a batch synthesis. The continuous-flow system was assembled from inexpensive laboratory parts – syringes, pumps, and stainless steel T-shape mixers.



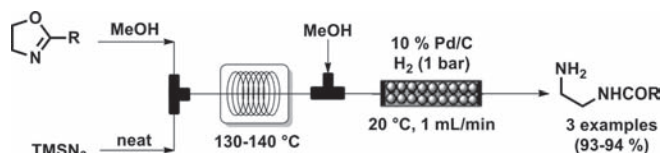
14/2011

A Two Step Continuous-Flow Synthesis of *N*-(2-Aminoethyl)acylamides through Ring-Opening/Hydrogenation of Oxazolines

Bernhard Gutmann, Jean-Paul Roduit, Dominique Roberge,* C. Oliver Kappe*

Chem. Eur. J. **2011**, 17, 13146–13150 DOI: 10.1002/chem.201102772

Ring opening of 2-oxazolines to generate compounds containing the *N*-(2-aminoethyl)acylamide scaffold is described. Neat TMSN_3 was used as a nucleophile in this reaction, followed by hydrogen reduction of the formed azide to the final products. After some initial optimization of the two reactions separately, a final protocol was developed, where an uninterrupted continuous-flow process was achieved. Importantly, the uninterrupted flow process provides additional safety, since the excess/unreacted HN_3 (toxic, explosive) formed in the ring-opening step is efficiently destroyed in the following hydrogenation step without disturbing the synthetic process.



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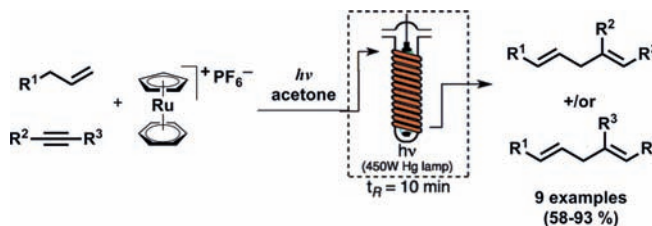
15/2011

Continuous Photochemical Generation of Catalytically Active [CpRu]⁺ Complexes from CpRu(η⁶-C₆H₆)PF₆

Alicia C. Gutierrez, Timothy F. Jamison*

Org. Lett. **2011**, *13*, 6414–6417 DOI: 10.1021/ol2027015

Using CpRu(η⁶-C₆H₆)PF₆ as a catalyst precursor, inter- and intramolecular ene–yne coupling reactions under continuous-flow UV-light conditions are reported. With some exceptions, most of the demonstrated examples gave similar results under batch and continuous-flow conditions. The used Ru-complex could be recovered nearly quantitatively and reused without any loss of activity. As UV-permeable tubing, either quartz or HPFA tube was used, both allowing the reaction to reach full conversion. The effect of residence time and catalyst loading on the outcome of the reaction was also examined.



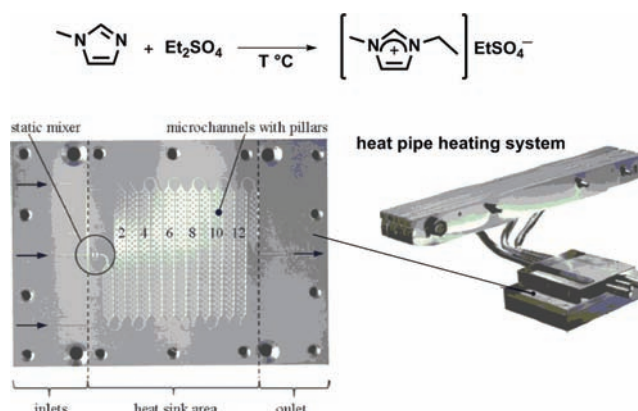
16/2011

Heat Pipe-Mediated Control of Fast and Highly Exothermic Reactions

Nadine Ehm, Holger Löwe*

Org. Process Res. Dev. **2011**, *15*, 1438–1441 DOI: 10.1021/op200216y

The synthesis of [EMIM]EtSO₄ as a highly exothermic process was used to examine a heating/cooling concept based on heat pipes, normally used to dissipate heat from computer processors. Once the activation barrier in the latter reaction is reached, the generated heat excess has to be kept under precise control in order to avoid hot spots or thermal runaways. Therefore, a complex thermal balance between providing activation energy and intense cooling of the reaction mixture is required. Heat pipes intrinsically allow both fast dynamic bidirectional heating and cooling. A stainless steel chip setup was mounted on the modified heat pipe setup. Working in a flow regime in the area of 100 °C, clean product could be obtained.



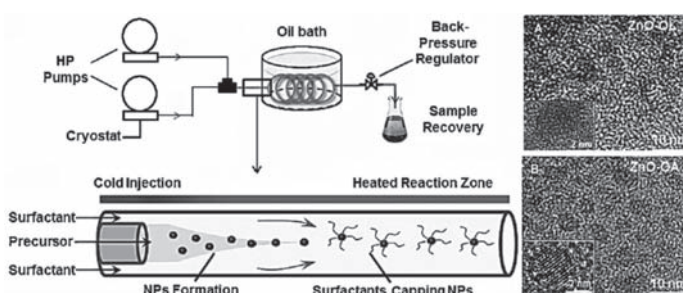
17/2011

Synthesis of Exciton Luminescent ZnO Nanocrystals Using Continuous Supercritical Microfluidics

Yann Roig, Samuel Marre, Thierry Cardinal, Cyril Aymonier*

Angew. Chem. Int. Ed. **2011**, *50*, 12071–12074 DOI: 10.1002/anie.201106201

An interesting microfluidic concept to synthesize exciton luminescent ZnO nanocrystals at supercritical conditions is demonstrated. The advanced optical properties of the as-synthesized ZnO nanostructures are obtained as a function of their nucleation and growth in supercritical fluids and the separation of nucleation/growth and functionalization steps, both being performed in a hydrodynamically controlled environment in the microreactors. Several operating parameters have been investigated: (1) the ligand (oleylamine, trioctylphosphine and oleic acid), (2) the ligand-to-zinc molar ratio, (3) the oxidant-to-zinc molar ratio and (4) the fluid velocity ratio. The experiments were carried out in a coaxial microsystem made of two fused silica capillaries immersed in a pre-heated oil bath (250 °C). The pressure was controlled with a back pressure regulator.



Further Flow Chemistry Publications

“Conversion of glycerol to acrolein in the presence of WO₃/TiO₂ catalysts”

A. Ulgen, W. F. Hoelderich

Applied Catalysis A: General **2011**, 400, 34–38

“Methanol dehydration to dimethyl ether in a platelet milli-reactor filled with H-ZSM5/SiC foam catalyst”

Y. Liu, S. Podila, D. L. Nguyen, D. Edouard, P. Nguyen, C. Pham, M. J. Ledoux, C. Pham-Huu

Applied Catalysis A: General **2011**, 409–410, 113–121

“Transesterification of sunflower oil over MoO₃ supported on alumina”

T. M. Sankaranarayanan, A. Pandurangan, M. Banu, S. Sivasanker

Applied Catalysis A: General **2011**, 409–410, 239–247

“Continuous syntheses of highly dispersed composite nanocatalysts via simultaneous co-precipitation in supercritical water”

X. Weng, J. Zhang, Z. Wu, Y. Liu, H. Wang, J. A. Darr

Applied Catalysis B: Environmental **2011**, 103, 453–461

“Continuous-flow synthesis of biaryls enabled by multistep solid-handling in a lithiation/borylation/Suzuki–Miyaura cross-coupling sequence”

W. Shu, L. Pellegatti, M. A. Oberli, S. L. Buchwald

Angewandte Chemie International Edition **2011**, 50, 10665–10669

“Mechanism-performance relationships of metal oxides in catalyzed HCl oxidation”

A. P. Amrute, C. Mondelli, M. A. G. Hevia, J. Perez-Ramírez

ACS Catalysis **2011**, 1, 583–590

“Carbon nanotube-supported RuFe bimetallic nanoparticles as efficient and robust catalysts for aqueous-phase selective hydrogenolysis of glycerol to glycols”

B. Li, J. Wang, Y. Yuan, H. Ariga, S. Takakusagi, K. Asakura

ACS Catalysis **2011**, 1, 1521–1528

“Zeolite- and MgO-supported molecular iridium complexes: support and ligand effects in catalysis of ethene hydrogenation and H-D exchange in the conversion of H₂ + D₂”

J. Lu, P. Serna, B. C. Gates

ACS Catalysis **2011**, 1, 1549–1561

“Production of propylene from 1-butene on highly active “Bi-functional single active site” catalyst: tungsten carbene-hydride supported on alumina”

E. Mazoyer, K. C. Szeto, S. Norsic, A. Garron, J.-M. Basset, C. P. Nicholas, M. Taoufik

ACS Catalysis **2011**, 1, 1643–1646

“Novel sol-gel lipases by designed bio-imprinting for continuous-flow kinetic resolutions”

G. Hellner, Z. Boros, A. Tomin, L. Poppe

Advanced Synthesis & Catalysis **2011**, 353, 2481–2491

“Ethene-induced temporary inhibition of Grubbs metathesis catalysts”

J. Scholz, S. Loekman, N. Szesni, W. Hieringer, A. Görling, M. Haumann, P. Wasserscheid

Advanced Synthesis & Catalysis **2011**, 353, 2701–2707

“Translation of microwave methodology to continuous flow for the efficient synthesis of diaryl ethers via a base-mediated S_NAr reaction”

C. Wiles, P. Watts

Beilstein Journal of Organic Chemistry **2011**, 7, 1360–1371

“Continuous preparation of carbon-nanotube-supported platinum catalysts in a flow reactor directly heated by electric current”

A. Schlange, A. R. dos Santos, U. Kunz, T. Turek

Beilstein Journal of Organic Chemistry **2011**, 7, 1412–1420

“Multistep flow synthesis of vinyl azides and their use in the copper-catalyzed Huisgen-type cycloaddition under inductive-heating conditions”

L. Kupracz, J. Hartwig, J. Wegner, S. Ceylan, A. Kirschning

Beilstein Journal of Organic Chemistry **2011**, 7, 1441–1448

“Continuous-flow enantioselective α-aminoxylation of aldehydes catalyzed by a polystyrene-immobilized hydroxyproline”

X. C. Cambeiro, R. Martín-Rapún, P. O. Miranda, S. Sayalero, E. Alza, P. Llanes, M. A. Pericàs

Beilstein Journal of Organic Chemistry **2011**, 7, 1486–1493

“The application of a monolithic triphenylphosphine reagent for conducting Appel reactions in flow microreactors”

K. A. Roper, H. Lange, A. Polyzos, M. B. Berry, I. R. Baxendale, S. V. Ley

Beilstein Journal of Organic Chemistry **2011**, 7, 1648–1655

“Continuous proline catalysis via leaching of solid proline”

S. M. Opalka, A. R. Longstreet, D. T. McQuade

Beilstein Journal of Organic Chemistry **2011**, 7, 1671–1679

“Continuous-flow hydration–condensation reaction: Synthesis of α,β-unsaturated ketones from alkynes and aldehydes by using a heterogeneous solid acid catalyst”

M. Rueping, T. Bootwicha, H. Baars, E. Sugiono

Beilstein Journal of Organic Chemistry **2011**, 7, 1680–1687

- “Liquid-phase catalytic transfer hydrogenation and cyclization of levulinic acid and its esters to γ -valerolactone over metal oxide catalysts”
M. Chia, J. A. Dumesic
Chemical Communications **2011**, 47, 12233–12235
- “Highly monodisperse conjugated polymer particles synthesized with drop-based microfluidics”
A. J. C. Kuehne, D. A. Weitz
Chemical Communications **2011**, 47, 12379–12381
- “In situ generation and intramolecular Schmidt reaction of keto azides in a microwave-assisted flow format”
T. O. Painter, P. D. Thornton, M. Orestano, C. Santini, M. G. Organ, J. Aube
Chemistry – A European Journal **2011**, 17, 9595–9598
- “New insights into cyclobutenone rearrangements: A total synthesis of the natural ROS-generating anti-cancer agent Cribrostatin 6”
M. Mohamed, T. P. Goncalves, R. J. Whitby, H. F. Sneddon, D. C. Harrowven
Chemistry – A European Journal **2011**, 17, 13698–13705
- “Continuous flow system with a polymer-supported dirhodium(II) catalyst: Application to enantioselective carbonyl ylide cycloaddition reactions”
Chemistry – A European Journal **2011**, 17, 13992–13998
- “Chemical synthesis of *Helicobacter pylori* lipopolysaccharide partial structures and their selective proinflammatory responses”
A. Shimoyama, A. Saeki, N. Tanimura, H. Tsutsui, K. Miyake, Y. Suda, Y. Fujimoto, K. Fukase
Chemistry – A European Journal **2011**, 17, 14464–14474
- “A single step methane conversion into synthetic fuels using microplasma reactor”
T. Nozaki, A. Agiral, S. Yuzawa, J. G. E. Han Gardeniers, K. Okazaki
Chemical Engineering Journal **2011**, 166, 288–293
- “Suspension catalysis in a liquid-liquid capillary microreactor”
A. Ufer, D. Sudhoff, A. Mescher, D. W. Agar
Chemical Engineering Journal **2011**, 167, 468–474
- “Enhanced production of ethyl pyruvate using gas-liquid slug flow in microchannel”
T. Yasukawa, W. Ninomiya, K. Ooyachi, N. Aoki, K. Mae
Chemical Engineering Journal **2011**, 167, 527–530
- “Novel Process Window for the safe and continuous synthesis of *tert*-butyl peroxy pivalate in a micro-reactor”
T. Illg, V. Hessel, P. Löb, J. C. Schouten
Chemical Engineering Journal **2011**, 167, 504–509
- “Fischer-Tropsch synthesis in microchannels”
L. C. Almeida, F. J. Echave, O. Sanza, M. A. Centeno, G. Arzamendi, L. M. Gandía, E. F. Sousa-Aguiar, J. A. Odriozola, M. Montes
Chemical Engineering Journal **2011**, 167, 536–544
- “Hydrothermal micro continuous-flow synthesis of spherical, cylinder-, star- and flower-like ZnO microparticles”
S. Li, G. A. Gross, P. M. Günther, J. M. Köhler
Chemical Engineering Journal **2011**, 167, 681–687
- “Microfluidic synthesis of silica nanoparticles using polyethylenimine polymers”
P. He, G. Greenway, S. J. Haswell
Chemical Engineering Journal **2011**, 167, 694–699
- “Production of unstable percarboxylic acids in a microstructured reactor”
F. Ebrahimi, E. Kolehmainen, P. Oinas, V. Hietapelto, I. Turunen
Chemical Engineering Journal **2011**, 167, 713–717
- “Reaction and Raman spectroscopic studies of alcohol oxidation on gold-palladium catalysts in microstructured reactors”
E. Cao, M. Sankar, S. Firth, K. F. Lam, D. Bethell, D. K. Knight, G. J. Hutchings, P. F. McMillan, A. Gavrilidis
Chemical Engineering Journal **2011**, 167, 734–743
- “Bridging the gap: A nested-pipe reactor for slow reactions in continuous flow chemical synthesis”
C. B. Minnich, L. Greinera, C. Reimers, M. Uerdingen, M. A. Liauwa
Chemical Engineering Journal **2011**, 168, 759–764
- “Design and experiments of a short-mixing-length baffled microreactor and its application to microfluidic synthesis of nanoparticles”
C. K. Chung, T. R. Shih, C. K. Chang, C. W. Lai, B. H. Wu
Chemical Engineering Journal **2011**, 168, 790–798
- “Synthesis of gold nanoparticles in an interdigital micromixer using ascorbic acid and sodium borohydride as reducers”
M. Luty-Błocho, K. Fitzner, V. Hessel, P. Löb, M. Maskos, D. Metzke, K. Paclawski, M. Wojnicki
Chemical Engineering Journal **2011**, 171, 279–290
- “Comparative study of the synthesis of silica nanoparticles in micromixer-microreactor and batch reactor systems”
L. Gutierrez, L. Gomez, S. Irusta, M. Arruebo, J. Santamaria
Chemical Engineering Journal **2011**, 171, 674–683

“Development of a gas-liquid microstructured system for oxidation of hydrogenated 2-ethyltetrahydroanthraquinone”

J. Tan, L. Du, Y. C. Lu, J. H. Xu, G. S. Luo

Chemical Engineering Journal **2011**, 171, 1406–1414

“Paramagnetic ionic liquids as “liquid fixed-bed” catalysts in flow application”

V. Misuk, D. Breuch, H. Löwe

Chemical Engineering Journal **2011**, 173, 536–540

“Effect of gas and liquid flow rates on the size distribution of barium sulfate nanoparticles precipitated in a two phase flow capillary microreactor”

D. Jeevarathinam, A. K. Gupta, B. Pitchumani, R. Mohan

Chemical Engineering Journal **2011**, 173, 607–611

“Flash synthesis of carbohydrate derivatives in chaotic microreactors”

Y.-T. Chen, K.-H. Chen, W.-F. Fang, S.-H. Tsai, J.-M. Fang, J.-T. Yang

Chemical Engineering Journal **2011**, 174, 421–424

“Heterogeneously catalyzed synthesis of performic acid in a microstructured reactor”

F. Ebrahimi, E. Kolehmainen, I. Turunen

Chemical Engineering Journal **2011**, 179, 312–317

“Multiphase minireactor system for direct fluorination of ethylene carbonate”

P. Lang, M. Hill, I. Krossing, P. Woias

Chemical Engineering Journal **2011**, 179, 330–337

“Scale-up concept for modular microstructured reactors based on mixing, heat transfer, and reactor safety”

N. Kockmann, D. M. Roberge

Chemical Engineering and Processing: Process Intensification **2011**, 50, 1017–1026

“Single-phase fluid flow distribution and heat transfer in microstructured reactors”

E. V. Rebrov, J. C. Schouten, M. H. J. M. de Croon

Chemical Engineering Science **2011**, 66, 1374–1393

“Two-phase microfluidic flows”

C.-X. Zhao, A. P. J. Middelberg

Chemical Engineering Science **2011**, 66, 1394–1411

“Nanoparticle synthesis in microreactors”

C.-X. Zhao, L. He, S. Z. Qiao, A. P. J. Middelberg

Chemical Engineering Science **2011**, 66, 1463–1479

“Gas–liquid and liquid–liquid mass transfer in microstructured reactors”

M. N. Kashid, A. Renken, L. Kiwi-Minsker

Chemical Engineering Science **2011**, 66, 3876–3897

“Direct conversion of methane in formaldehyde at very short residence time”

J. Zhang, V. Burkle-Vitzthum, P. M. Marquaire, G. Wild, J. M. Commenge

Chemical Engineering Science **2011**, 66, 6331–6340

“Rate Acceleration of the Baylis–Hillman Reaction within Microreactors”

J. Yang, L. Qi, J. Qiao, Y. Chen, H. Ma

Chinese Journal of Chemistry **2011**, 29, 2385–2388

“The first case of competitive heterogeneously catalyzed hydrogenation using continuous-flow fixed-bed reactor system: hydrogenation of binary mixtures of activated ketones on Pt-alumina and on Pt-alumina-cinchonidine catalysts”

G. Szöllősi, Z. Makra, F. Fülöp, M. Bartók

Catalysis Letters **2011**, 141, 1616–1620

“Intramolecular cyclisation of isosorbide by dimethylcarbonate chemistry”

P. Tundo, F. Arico, G. Gauthier, A. Baldacci

Comptes Rendus Chimie **2011**, 14, 652–655

“Immobilised photosensitisers for continuous flow reactions of singlet oxygen in supercritical carbon dioxide”

X. Han, R. A. Bourne, M. Poliakoff, M. W. George

Chemical Science **2011**, 2, 1059–1067

“Use of precatalysts greatly facilitate palladium-catalyzed alkynylations in batch and continuous-flow conditions”

W. Shu, S. L. Buchwald

Chemical Science **2011**, 2, 2321–2325

“Ethanol dehydration to ethylene in a stratified autothermal millisecond reactor”

M. J. Skinner, E. L. Michor, W. Fan, M. Tsapatsis, A. Bhan, L. D. Schmidt

ChemSusChem **2011**, 4, 1151–1156

“High-quality diesel from hexose- and pentose-derived biomass platform molecules”

A. Corma, O. de la Torre, M. Renz

ChemSusChem **2011**, 4, 1574–1577

“Hydrodesulphurisation of 4,6-dimethyldibenzothiophene over NiMo catalysts supported on Ti(Al) modified MCM-41”

K. Jaroszewska, M. Lewandowski, J. R. Grzechowiak, B. Szyja

Catalysis Today **2011**, 176, 202–207

“Synthesis of (–)-Oseltamivir by using a microreactor in the Curtius rearrangement”

H. Ishikawa, B. P. Bondzic, Y. Hayashi

European Journal of Organic Chemistry **2011**, 6020–6031

“Efficient and ‘green’ microwave-assisted synthesis of haloalkylphosphonates via the Michaelis–Arbuzov reaction”

P. Jansa, A. Holy, M. Dracinsky, O. Baszczynski, M. Cesnek, Z. Janeba

Green Chemistry **2011**, 13, 882–888

“Efficient enhancement of copper-pyridineoxazoline catalysts through immobilization and process design”

C. Aranda, A. Cornejo, J. M. Fraile, E. Garcia-Verdugo, M. J. Gil, S. V. Luis, J. A. Mayoral, V. Martinez-Merino, Z. Ochoa

Green Chemistry **2011**, 13, 983–990

“Continuous biocatalytic synthesis of (R)-2-octanol with integrated product separation”

C. Kohlmann, S. Leuchs, L. Greiner, W. Leitner

Green Chemistry **2011**, 13, 1430–1436

“Highly selective hydroformylation of long-chain alkenes in a supercritical fluid ionic liquid biphasic system”

T. E. Kunene, P. B. Webb, D. J. Cole-Hamilton

Green Chemistry **2011**, 13, 1476–1481

“Decision support towards agile eco-design of microreaction processes by accompanying (simplified) life cycle assessment”

S. Huebschmann, D. Kralisch, H. Löwe, D. Breuch, J. H. Petersen, T. Dietrich, R. Scholz

Green Chemistry **2011**, 13, 1694–1707

“A catalytic route to lower alcohols from glycerol using Ni-supported catalysts”

E. van Ryneveld, A. S. Mahomed, P. S. van Heerden, M. J. Green, H. B. Friedrich

Green Chemistry **2011**, 13, 1819–1827

“Direct transformation of ethanol into ethyl acetate through catalytic membranes containing Pd or Pd-Zn: comparison with conventional supported catalysts”

A. B. Sanchez, N. Homs, S. Miachon, J.-A. Dalmon, J. L. G. Fierro, P. R. de la Piscina

Green Chemistry **2011**, 13, 2569–2575

“Tungsten-Vanadium mixed oxides for the oxidehydration of glycerol into acrylic acid”

M. D. Soriano, P. Concepcion, J. M. L. Nieto, F. Cavani, S. Guidetti, C. Trevisanut

Green Chemistry **2011**, 13, 2954–2962

“Silica-supported guanidine catalyst for continuous flow biodiesel production”

J. M. Balbino, E. W. de Menezes, E. V. Benvenuti, R. Cataluna, G. Ebeling, J. Dupont

Green Chemistry **2011**, 13, 3111–3116

“JandaJel as a polymeric support to improve the catalytic efficiency of immobilized-1,5,7-triazabicyclo[4.4.0]dec-5-ene (TBD) under solvent-free conditions”

D. Lanari, R. Ballini, S. Bonollo, A. Palmieri, F. Pizzo, L. Vaccaro

Green Chemistry **2011**, 13, 3181–3186

“Inhibition of gold and platinum catalysts by reactive intermediates produced in the selective oxidation of alcohols in liquid water”

B. N. Zope, R. J. Davis

Green Chemistry **2011**, 13, 3483–3491

“Microreactor system for high-pressure continuous flow homogeneous catalysis measurements”

J. Keybl, K. F. Jensen

Industrial Engineering Chemistry Research **2011**, 50, 11013–11022

“Step changes and deactivation behavior in the continuous decarboxylation of stearic acid”

A. T. Madsen, B. Rozmyszowicz, I. L. Simakova, T. Kilpiö, A.-R. Leino, K. Kordas, K. Eränen, P. Mäki-Arvela, D. Y. Murzin

Industrial Engineering Chemistry Research **2011**, 50, 11049–11058

“Modeling of toluene acetylation with acetic anhydride on H-USY zeolite”

E. A. Dejaegere, J. W. Thybaut, G. B. Marin, G. V. Baron, J. F. M. Denayer

Industrial Engineering Chemistry Research **2011**, 50, 11822–11832

“Controllable preparation of poly(butyl acrylate) by suspension polymerization in a coaxial capillary microreactor”

Z. Liu, Y. Lu, B. Yang, G. Luo

Industrial Engineering Chemistry Research **2011**, 50, 11853–11862

“Methanol to gasoline-range hydrocarbons: influence of nanocrystal size and mesoporosity on catalytic performance and product distribution of ZSM-5”

A. A. Rownaghi, J. Hedlund

Industrial Engineering Chemistry Research **2011**, 50, 11872–11878

“Development of a photochemical microfluidics platform”

K. Pimparkar, B. Yen, J. R. Goodell, V. I. Martin, W.-H. Lee, J. A. Porco, Jr., A. B. Beeler, K. F. Jensen

Journal of Flow Chemistry **2011**, 1, 53–55

“An integrated synthesis–purification system to accelerate the generation of compounds in pharmaceutical discovery”

J. E. Hochlowski, P. A. Searle, N. P. Tu, J. Y. Pan, S. G. Spanton, S. W. Djuric

Journal of Flow Chemistry **2011**, 1, 56–61

“A continuous-flow system for asymmetric hydrogenation using supported chiral catalysts”

J. Madarász, G. Farkas, S. Balogh, Á. Szöllősy, J. Kovács, F. Darvas, L. Ürge, J. Bakos

Journal of Flow Chemistry **2011**, 1, 62–67

“Reissert indole synthesis using continuous-flow hydrogenation”

E. Colombo, P. Ratel, L. Mounier, F. Guillier

Journal of Flow Chemistry **2011**, 1, 68–73

“Cost analysis for a continuously operated fine chemicals production plant at 10 kg/day using a combination of microprocessing and microwave heating”

F. Benaskar, A. Ben-Abdelmoumen, N. G. Patil, E.V. Rebrov, J. Meuldijk, L. A. Hulshof, V. Hessel, U. Krtischil, J. C. Schouten

Journal of Flow Chemistry **2011**, 1, 74–89

“White light emission from Mn-doped ZnSe d-dots synthesized continuously in microfluidic reactors”

P. Shao, H. Wang, Q. Zhang, Y. Li

Journal of Materials Chemistry **2011**, 21, 17972–17977

“Flow reactor synthesis of CdSe, CdS, CdSe/CdS and CdSeS nanoparticles from single molecular precursor(s)”

A. L. Abdelhady, M. Afzaal, M. A. Malik, P. O’Brien

Journal of Materials Chemistry **2011**, 21, 18768–18775

“Synthesis and biochemical evaluation of Δ^2 -isoxazoline derivatives as DNA methyltransferase 1 inhibitors”

S. Castellano, D. Kuck, M. Viviano, J. Yoo, F. Lopez-Vallejo, P. Conti, L. Tamborini, A. Pinto, J. L. Medina-Franco, G. Sbardella

Journal of Medicinal Chemistry **2011**, 54, 7663–7677

“Porous photocatalytic membrane microreactor (P2M2): A new reactor concept for photochemistry”

H. C. Aran, D. Salamon, T. Rijnaarts, G. Mul, M. Wessling, R. G. H. Lammertink

Journal of Photochemistry and Photobiology A: Chemistry **2011**, 225, 36–41

“Determination of kinetic constants of a photocatalytic reaction in micro-channel reactors in the presence of mass-transfer limitation and axial dispersion”

G. Charles, T. Roques-Carmes, N. Becheikh, L. Falk, J.-M. Commenge, S. Corbel

Journal of Photochemistry and Photobiology A: Chemistry **2011**, 225, 202–211

“Meerwein–Ponndorf–Verley reduction of aldehydes formed in situ from α - and β -pinene epoxides in a supercritical fluid in the presence of alumina”

I. V. Il’ina, S. Yu. Kurbakova, K. P. Volcho, N. F. Salakhutdinov, V. I. Anikeev

Journal of Saudi Chemical Society **2011**, 15, 313–317

“Small molecule library synthesis using segmented flow”

C. M. Thompson, J. L. Poole, J. L. Cross, I. Akritopoulou-Zanze, S. W. Djuric

Molecules **2011**, 16, 9161–9177

“Enantioselective radical cyclisation reactions of 4-substituted quinolones mediated by a chiral template”

A. Bakowski, M. Dressel, A. Bauer, T. Bach

Organic & Biomolecular Chemistry **2011**, 9, 3516–3529

“Syntheses of mGluR5 PET radioligands through the radiofluorination of diaryliodonium tosylates”

S. Telu, J.-H. Chun, F. G. Simeon, S. Lu, V. W. Pike

Organic & Biomolecular Chemistry **2011**, 9, 6629–6638

“Perfluoroalkylation in flow microreactors: generation of perfluoroalkyllithiums in the presence and absence of electrophiles”

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