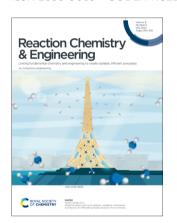
Reaction Chemistry & Engineering

Bridging the gap between chemistry and chemical engineering rsc.li/reaction-engineering

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2058-9883 CODEN RCEEBW 8(5) 945-1218 (2023)



See Pedro Castaño et al., pp. 989-1004.

Image reproduced by permission of Pedro Castaño from React. Chem. Eng., 2023, 8, 989. The authors would like to acknowledge S. Ramirez Cherbuy for designing the artwork.

REVIEW

Non-fouling flow reactors for nanomaterial synthesis

Maximilian O. Besenhard, Sayan Pal, Georgios Gkogkos and Asterios Gavriilidis*

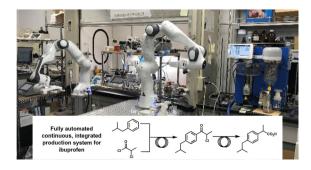


COMMUNICATIONS

978

Development of a fully automated continuous, integrated production system for all reaction processes of ibuprofen

Akichika Itoh,* Tomoka Tanemura, Norihiro Tada and Eiji Yamaguchi



Editorial Staff

Evecutive Editor

Maria Southall

Deputy Editor

Bianca Provost

Editorial Production Manager

Cara Sutton

Assistant Editors

Sean Browner, Molly Colgate, Paul Scott, Alison Winder

Editorial Assistant

Publishing Assistant Allison Holloway

Publisher

Sam Keltie

For queries about submitted papers, please contact Cara Sutton, Editorial Production Manager in the first instance, E-mail: reactionchemeng@rsc.org

For pre-submission queries please contact Maria Southall, Executive Editor. E-mail: reactionchemeng-rsc@rsc.org

Reaction Chemistry & Engineering (electronic: ISSN 2058-9883) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry,

Thomas Graham House, Science Park, Milton Road, Cambridge,

Tel +44 (0)1223 432398; E-mail: orders@rsc.org

2023 Annual (electronic) subscription price: £2584; \$4262. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office Burlington House, Piccadilly, London W1J 0BA, UK,

Advertisement sales

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017;

E-mail: advertising@rsc.org

Telephone: +44 (0) 207 4378 6556.

For marketing opportunities relating to this journal. contact marketing@rsc.org

Reaction Chemistry & Engineering

rsc.li/reaction-engineering

Bridging the gap between chemistry and chemical engineering

Editorial Board

Editor-in-Chief

Klavs F Jensen, Massachusetts Institute of Technology, USA

Associate Editors

Ian R Baxendale, Durham University, UK Richard Bourne, University of Leeds, UK Saif A Khan, National University of Singapore,

Francesca Paradisi University of Bern, Switzerland Laura Torrente, University of Cambridge, UK Haihui Wang, Tsinghua University, China

Members

Shane Grosser Merck USA Petra de Jonah Utrecht University Netherlands Heather Kulik, Massachusetts Institute of Technology, USA

Anita Maguire, University College Cork, Ireland Megan Smyth, Almac Sciences

Advisory Board

Malcolm Berry, MB Chemistry Consulting Ltd., UK Claude de Bellefon, University of Lyon, France Donna G Blackmond, Scripps Research Institute,

Wayne Blaylock, Dow Chemical Company, USA Cara Brocklehurst, Novartis AG, Switzerland Jian-Feng Chen, Beijing University of Chemical Technology, China

Ya-Huei Chin, University of Toronto, Canada Evelina Colacino, University of Montpellier, France Avelino Corma, Polytechnical University of Valencia. Spain

Anna Croft, University of Nottingham, UK Paul Dauenhauer, University of Minnesota, USA Stevan Djuric, Abbvie, USA

Raj Gounder, Purdue University, USA Raju Kumar Gupta, Indian Institute of Technology Kanpur, India

Dorota Gryko, Polish Academy of Sciences, Poland Ryan Hartman, New York University, USA Joel M Hawkins, Pfizer Worldwide R&D, USA Ive Hermans, University of Wisconsin-Madison,

Volker Hessel, University of Adelaide, Australia Lin Huang, Trunk & Petal Pte Ltd., Singapore Marty Johnson, Eli Lilly, USA

Oliver Kappe, University of Graz, Austria Alexander Katz, University of California, Berkeley,

Francesca Kerton, Memorial University, Canada Beata Kilos-Réaume, Dow, USA Dong Pyo Kim, POSTECH, Republic of Korea Shu Kobayashi, University of Tokyo, Japan Amol Kulkarni, National Chemical Research Laboratory, India

Alexei Lapkin, University of Cambridge, UK Hélène Lebel, University of Montreal, Canada Angeliki Lemonidou, Aristotle University of

Guangsheng Luo, Tsinghua University, China Haresh Manyar, Queen's University Belfast, UK Rebecca Meadows, AstraZeneca, UK Massimo Morbidelli, Milano Politecnico, Italy Timothy Noël, University of Amsterdam, Netherlands

Matthew O'Brian, Keele University, UK Tatsuya Okubo, University of Tokyo, Japan Polona Žnidaršič Plazl, University of Ljubljana,

Anastasios Polyzos, University of Melbourne, Australia Jeffrey Rimer, University of Houston, USA

Rebecca Ruck, Merck & Co. Inc., Kenilworth. NJ, USA

Andrew Rutter, GlaxoSmithKline, UK Susannah Scott, UC Santa Barbara, USA Doris Segets, University of Duisburg-Essen, Germany

Manish Sharma, BASF, USA Jay Siegel, Tianjin University, China Ning Sun, Lawrence Berkeley National Laboratory,

Annette Taylor, University of Sheffield, UK Enrico Tronconi, University of Milan, Italy Veronique Van Speybroeck, Ghent University,

Dionisios G Vlachos, University of Delaware, USA Siegfried Waldvogel, Johannes Gutenberg Universität Mainz, Germany Robin White, Luxembourg Institute for Science & Technology, Luxembourg Karen Wilson, RMIT University, Australia

Sheryl L. Wiskur, University of South Carolina, USA Wen-De Xiao, Shanghai Jiao Tong University,

Zhen Yao, Zhejiang University, China

Information for Authors

Full details on how to submit material for publication in Reaction Chemistry & Engineering are given in the Instructions for Authors (available from http://www.rsc.org/authors). Submissions should be made via the journal's $home page: rsc. li/reaction-engineering. \, Submissions: The journal \, welcomes$ submissions of manuscripts for publication as Review Articles and Minireviews, Full Papers and Communications should describe original work of high quality and impact.

Additional details are available from the Editorial Office or http://www.rsc.org/authors

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)-Reproduced by permission of the Royal Society

This journal is © The Royal Society of Chemistry 2023. Apart from fair dealing for the purposes of research or private study for

non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

Registered charity number: 207890

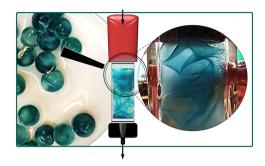


COMMUNICATIONS

984

A 3D printable synthetic hydrogel as an immobilization matrix for continuous synthesis with fungal peroxygenases

Lars-Erik Meyer, Dorottya Horváth, Sonja Vaupel, Johanna Meyer, Miguel Alcalde and Selin Kara*

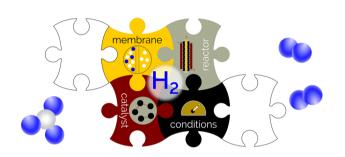


PAPERS

989

Modeling-aided coupling of catalysts, conditions, membranes, and reactors for efficient hydrogen production from ammonia

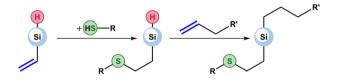
Natalia Realpe, Shekhar R. Kulkarni, Jose L. Cerrillo, Natalia Morlanés, Gontzal Lezcano, Sai P. Katikaneni, Stephen N. Paglieri, Mohammad Rakib, Bandar Solami, Jorge Gascon and Pedro Castaño*



1005

Sequential hydrothiolation-hydrosilylation: a route to the creation of new organosilicon compounds with preset structures

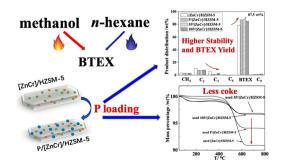
Ilya Krizhanovskiy, Maxim Temnikov,* Fedor Drozdov, Alexander Peregudov and Anton Anisimov



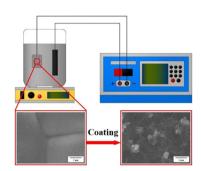
1015

Enhanced aromatics selectivity and stability in a coaromatization reaction over P/[ZnCr]/HZSM-5

Junmin Lv, Dan Wang, Bing Zhu, Haibo Li, Subing Fan* and Tian-sheng Zhao



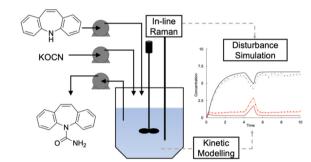
1023



Electrodeposition of activated carbon on Ni foam for monolithic catalysts and intensification of hydrogenation performance in a micropacked bed

Chi Ma, Wei Liu, Fengyan Lou, Chenghao Zhang and Jisong Zhang*

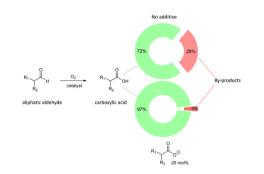
1032



Development of a continuous synthesis process for carbamazepine using validated in-line Raman spectroscopy and kinetic modelling for disturbance simulation

Matthew Glace, Wei Wu, Harrison Kraus, David Acevedo, Thomas D. Roper and Adil Mohammad*

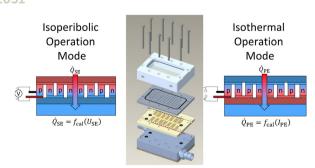
1043



Selective aerobic oxidation of aliphatic aldehydes: the critical role of percarboxylate anion on the selectivity

Laurent Vanoye and Alain Favre-Réguillon*

1051



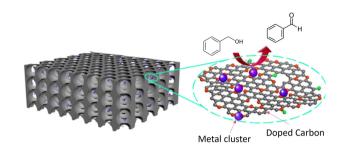
Design and characterization of a flow reaction calorimeter based on FlowPlate® Lab and Peltier

Timothy A. Frede,* Nils vom Hofe, Rafael Jasper Reuß, Niklas Kemmerling, Tobias Kock, Frank Herbstritt and Norbert Kockmann*

1061

Enhanced activation of persulfate improves the selective oxidation of alcohols catalyzed by earthabundant metal oxides embedded on porous N-doped carbon derived from chitosan

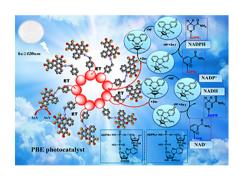
Rafael L. Oliveira,* Marcin Pisarek, Karolina A. Ledwa, Grzegorz Pasternak and Leszek Kepinski



1072

Polystyrene-based eosin-Y as a photocatalyst for solar light-mediated NADH/NADPH regeneration and organic transformations

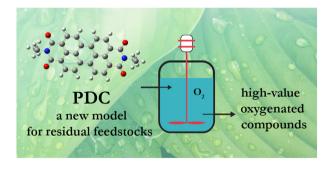
Pooja Singh, Surabhi Chaubey, Chandani Singh, Satyam Singh, Rajesh K. Yadav,* Atul P. Singh, P. D. Subhash, Dhanesh Tiwari, Navneet K. Gupta and Tae Wu Kim*



1083

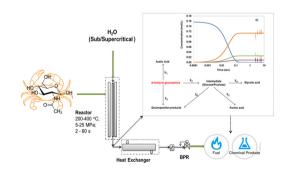
Thermo-oxidative conversion of PDC as a molecular model of residual feedstocks to oxygen-rich chemicals

Redhwan Al-Akbari, Maryam Razi, Ismail Badran and Nashaat N. Nassar*

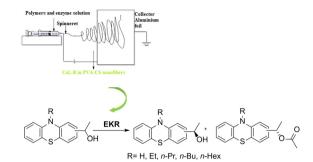


Reaction pathways and kinetics of N-acetyl-Dglucosamine hydrolysis in sub- and supercritical

Sphurti P. Kulkarni, Sunil S. Joshi and Amol A. Kulkarni*

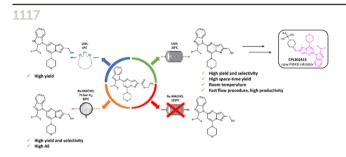


1109



A robust and efficient lipase based nanobiocatalyst for phenothiazinyl-ethanol resolution

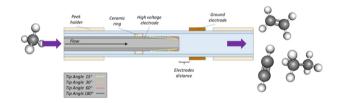
Cristina-Georgiana Spelmezan, Gabriel Katona, László Csaba Bencze, Csaba Paizs and Monica Ioana Toşa*



Development and optimization of a continuous flow ester reduction with LiAlH4 in the synthesis of a key intermediate for a PI3Kδ inhibitor (CPL302415)

Stanisław Michałek,* Anna M. Maj,* Lidia Gurba-Bryśkiewicz, Wioleta Maruszak, Marcin Zagozda, Zbigniew Ochal, Krzysztof Dubiel and Maciej Wieczorek

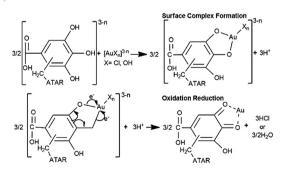
1125



On design of plasma jet reactor for non-oxidative methane conversion

Giulia De Felice, Sirui Li,* Fausto Gallucci, Nima Pourali and Evgeny Rebrov

1134



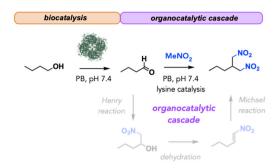
Synthesis of an ethylene diamine modified tannin polymer and recovery of gold(III) ions from electronic wastes

Engin Deniz Parlar, Özge Özten, Abdulkadir Kızılaslan and Mustafa Can*

1152

One-pot cascade reactions for the synthesis of dinitroalkanes in aqueous buffer

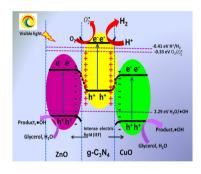
Kelsey N. Stewart, Kendyll G. Hawkins, Campbell M. Andersen and Dylan W. Domaille*



1159

Dual S-scheme ZnO-g- C_3N_4 -CuO heterosystem: a potential photocatalyst for H_2 evolution and wastewater treatment

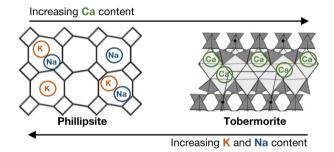
Irshad Ahmad,* Shazia Shukrullah, Muhammad Yasin Naz and Haq Nawaz Bhatti



1176

Metal cations as inorganic structure-directing agents during the synthesis of phillipsite and tobermorite

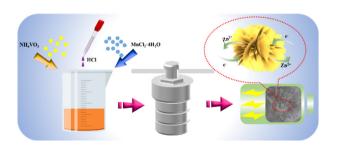
Juan Carlos Vega-Vila, Advait Holkar, Ross A. Arnold, Dale P. Prentice, Shiqi Dong, Longwen Tang, Erika Callagon La Plante, Kirk Ellison, Aditya Kumar, Mathieu Bauchy, Samanvaya Srivastava,* Gaurav Sant and Dante Simonetti*



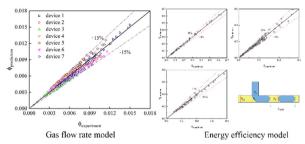
1185

Morphology modulation and electrochemical performance properties of Mn-decorated $(NH_4)_2V_{10}O_{25}\cdot 8H_2O$ as a cathode material for aqueous zinc-ion batteries

Lingjiang Kou, Yong Wang, Jiajia Song,* Taotao Ai,* Koji Kajiyoshi,* Panya Wattanapaphawong and Jintao Wang



1192



To design gas-liquid Taylor flow T-juntion microreactor

A general design procedure for gas-liquid Taylor flow T-junction microreactors

Yu Chang, Lin Sheng, Jian Deng and Guangsheng Luo*

1204

On the Brønsted acid-catalyzed aza-Michael reaction of isoxazol-5-ones to enones: reaction optimization, scope, mechanistic investigations and scale-up

Marcelo M. de Siqueira, Pedro P. de Castro,* Juliana A. dos Santos, Leonã S. Flores, Walysson F. de Paiva, Sergio A. Fernandes and Giovanni W. Amarante*