## **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 9(1) 1-212 (2024)



#### Cover See Darren L. Riley et al., pp. 45-57. Image reproduced by permission of Darren Riley & Jenny-Lee Panayides from React. Chem. Eng., 2024, 9, 45.



Inside cover See András Perczel et al., pp. 58-69. Image reproduced by permission of András Perczel from React. Chem. Eng., 2024,

#### **REVIEW**

Batch and continuous flow mechanochemical synthesis of organic compounds including APIs

Ranjit S. Atapalkar and Amol A. Kulkarni\*

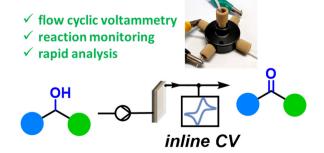


#### **COMMUNICATIONS**

26

Development of an open-source flow-through cyclic voltammetry cell for real-time inline reaction analytics

Eduardo Rial-Rodríguez, Jason D. Williams, Hans-Michael Eggenweiler, Thomas Fuchss, Alena Sommer, C. Oliver Kappe and David Cantillo\*





# Fuelling your energy research



## **Energy & Environmental Science**

Agenda-setting research in energy science and technology

#### Chair of the Editorial Board

Jenny Nelson, Imperial College London, UK Impact factor 2021: 39.714, median time to first decision (peer reviewed articles only): 46 days\*.

rsc.li/ees



## **EES Catalysis**

Exceptional research on energy and environmental catalysis

#### **Editor-in-Chief**

Shizhang Qiao, University of Adelaide, Australia Median time to first decision (peer reviewed articles only): 24 days\*.

rsc.li/ees-catalysis



## **Sustainable Energy & Fuels**

Driving the development of sustainable energy technologies through cutting edge research

#### Editor-in-Chief

Garry Rumbles, National Renewable Energy Laboratory and University of Colorado Boulder, USA Impact factor 2021: 6.813, median time to first decision (peer reviewed articles only): 28 days\*.

rsc.li/sustainable-energy



## **Energy Advances**

Embracing research at the nexus of energy science and sustainability

#### **Editor-in-Chief**

Volker Presser, Leibniz Institute for New Materials, Germany Median time to first decision (peer reviewed articles only): 32 days\*.

rsc.li/energy-advances

## Submit your work today

rsc.li/energy

\*Visit rsc.li/metrics-explainer for more information

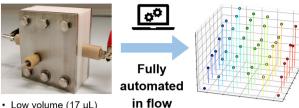
Registered charity number: 207890

#### COMMUNICATIONS

31

#### A low-volume flow electrochemical microreactor for rapid and automated process optimization

Eduardo Rial-Rodríguez, Johannes F. Wagner, Hans-Michael Eggenweiler, Thomas Fuchss, Alena Sommer, C. Oliver Kappe, Jason D. Williams\* and David Cantillo\*



- Low volume (17 μL)
- Fast reactions (7 s)
- · Low reagent consumption
- √ 42 reactions per run
- √ 3 chemical examples

#### Design and evaluation of a microrectification platform using 3D printing

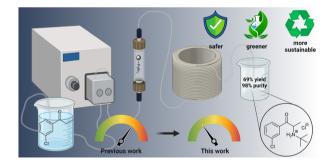
Yuting Zheng, Guandong Fang, Zhuoqin Fan, Haomiao Zhang,\* Jingdai Wang and Yongrong Yang



#### **PAPERS**

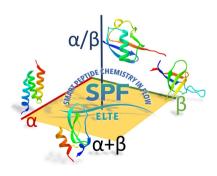
#### The synthesis of bupropion hydrochloride under greener and safer conditions utilizing flow technologies

Lorinda T. van Wyk, Nicole C. Neyt, Jaimee Jugmohan, Jenny-Lee Panayides and Darren L. Riley\*



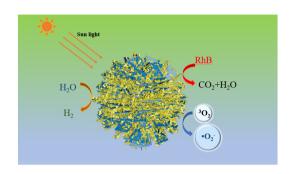
#### Synthesis of small protein domains by automated flow chemistry

Kristóf Ferentzi, Dóra Nagy-Fazekas, Viktor Farkas and András Perczel\*



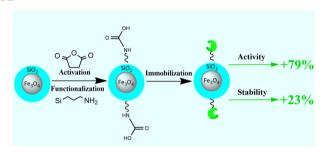
#### **PAPERS**

70



An investigation on a WO<sub>3</sub>/MoO<sub>3-x</sub> heterojunction photocatalyst for excellent photocatalytic performance and enhanced molecular oxygen activation ability

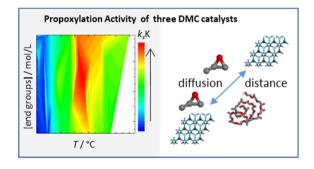
Yuxuan Shao, Dan You,\* Yuqi Wan, Qingrong Cheng\* and Zhiquan Pan



Improvement of DERA activity and stability in the synthesis of statin precursors by immobilization on magnetic nanoparticles

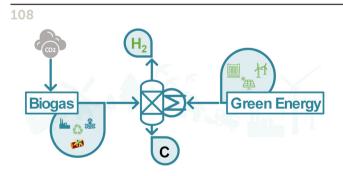
Dino Skendrović, Anera Švarc, Tonči Rezić, Andrey Cherney, Aleksandra Rađenović and Ana Vrsalović Presečki\*

91



Analysis of propoxylation with zinc-cobalt double metal cyanide catalysts with different active surfaces and particle sizes

Sarah-Franziska Stahl and Gerrit A. Luinstra\*



Pyrolysis of biogas for carbon capture and carbon dioxide-free production of hydrogen

Ahmet Çelik, Iadh Ben Othman, Heinz Müller, Patrick Lott\* and Olaf Deutschmann

#### **PAPERS**

#### 119

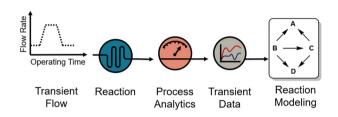
LearnCK: mass conserving neural network reduction of chemistry and species of microkinetic models

Sashank Kasiraju and Dionisios G. Vlachos\*



Dynamic experiments in flow accelerate reaction network definition in a complex hydrogenation using catalytic static mixers

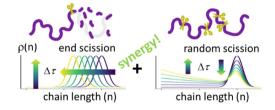
Stefano Martinuzzi, Markus Tranninger, Peter Sagmeister, Martin Horn, Jason D. Williams\* and C. Oliver Kappe\*



#### 139

Quantifying synergy for mixed end-scission and random-scission catalysts in polymer upcycling

Ziqiu Chen, Emmanuel Ejiogu and Baron Peters\*



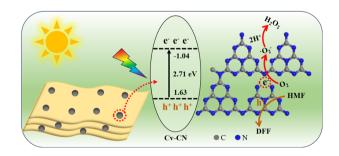
Slowly, slowly, slowly getting faster... Faster, faster, it is so exciting...

- the Count, Sesame Street

#### 148

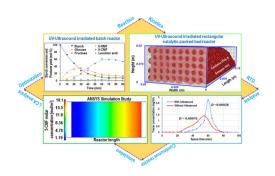
Carbon-vacancy engineering approach to g-C<sub>3</sub>N<sub>4</sub> for selective 5-hydroxymethylfurfural oxidation coupled with H<sub>2</sub>O<sub>2</sub> production

Jingru Han, Mengzhen Song, Yingjie Li, Yue Yao, Shuxiang Lu and Xiaoyuan Liao\*



#### **PAPERS**

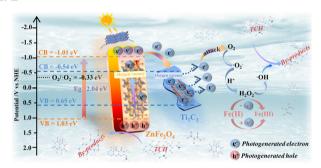
160



Energy-efficient and eco-friendly continuous production of 5-CMF in a UV-ultrasound irradiated catalytic packed bed reactor: heterogeneous kinetics, reactor simulation and LCA analysis

Sourav Barman and Rajat Chakraborty\*

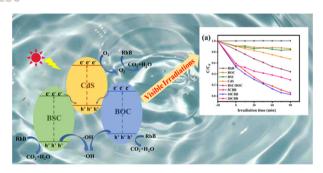
172



Preparing Ti<sub>3</sub>C<sub>2</sub>-modified ZnFe<sub>2</sub>O<sub>4</sub> photocatalytic materials and evaluating their performance in degrading tetracycline in water

Hongqing He, Yu Fang, Xinhao Sun, Xianbin Li, Shunzhi Li and Yang Cao\*

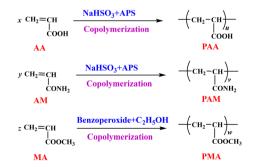
186



Synthesis of double Z-scheme CdS/Bi<sub>2</sub>O<sub>2</sub>CO<sub>3</sub>/BiOCl heterojunction photocatalysts for degradation of rhodamine B under visible light

Yueyi Li, Yuehui Liu, Xuguang Liu and Xia Li\*

199



Catalytic Mannich reaction of acrylic acid polymers and their application in leather retanning

Jianzhong Ma,\* Jiamin Zhao, Hui Zhang, Zhenhua Tian,\* Qiwu Liu, Na Yang and Wenbo Zhang

### CORRECTION

209

Correction: From traditional to greener alternatives: potential of plant resources as a biotransformation tool in organic synthesis

Vinay Kumar, Rituparna Saha, Satyaki Chatterjee\* and Vivek Mishra\*