ChemComm

Chemical Communications

rsc.li/chemcomm

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 1359-7345 CODEN CHCOFS 59(96) 14187-14330 (2023)



Cover

See Motoki Ito, Shigeo Sugiyama et al., pp. 14249-14252. Image reproduced by permission of Motoki Ito from Chem. Commun., 2023, 59, 14249.



Inside cover

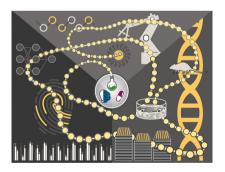
See Lauren E. Wenger and Timothy P. Hanusa, pp. 14210-14222. Image reproduced by permission of Timothy P. Hanusa from Chem. Commun., 2023, 59, 14210.

HIGHLIGHT

14197

Frontiers in nonviral delivery of small molecule and genetic drugs, driven by polymer chemistry and machine learning for materials informatics

Jeffrey M. Ting,* Teresa Tamayo-Mendoza, Shannon R. Petersen, Jared Van Reet, Usman Ali Ahmed, Nathaniel J. Snell, John D. Fisher, Mitchell Stern and Felipe Oviedo

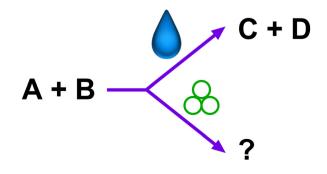


FEATURE ARTICLES

14210

Synthesis without solvent: consequences for mechanochemical reactivity

Lauren E. Wenger and Timothy P. Hanusa*



Editorial Staff

Executive Editor

Richard Kelly

Deputy Editor

Harriet Riley

Editorial Production Manager Helen Saxton

Development Editors

Danny Andrews, Ershad Abubacker

Senior Publishing Editor

Publishing Editors

Kirstine Anderson, Matthew Bown, Laura Cooper, Hannah Fielding, Anoushka Handa, Claire Harding, Alan Holder, Charlie Palmer, Rosie Rothwell, Donna Smith, Laura Smith

Editorial Assistant

Iade Holliday

Publishing Assistant Natalie Ford

Publisher

Jeanne Andres

For queries about submitted papers, please contact Helen Saxton, Editorial Production Manager in the first instance. E-mail chemcomm@rsc.org

For pre-submission queries please contact Richard Kelly, Executive Editor. Email chemcomm-rsc@rsc.org

Chemical Communications (print: ISSN 1359-7345; electronic: ISSN 1364-548X) is published 100 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, CB4 0WF, UK

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

2023 Annual (electronic) subscription price: £3,553 / US\$6,258. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

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, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

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

E-mail advertising@rsc.org

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

ChemComm

Chemical Communications

rsc.li/chemcomm

Editorial Board

Chair

Douglas Stephan, University of Toronto

Associate Editors

Lutz Ackermann, University of Göttingen Davide Bonifazi. University of Vienna Fengtao Fan, Chinese Academy of Sciences Itaru Hamachi, Kyoto University Michaele Hardie, University of Leeds Kim Jelfs, Imperial College London Chao-Jun Li, McGill University David Lou, City University of Hong Kong Connie Lu, University of Minnesota, US Marinella Mazzanti, EPFL, Switzerland Amy Prieto, Colorado State University Yang Tian, East China Normal University Sandeep Verma, Indian Institute of Technology Kanpur

Advisory Board

Brendan Abrahams, University of Melbourne Polly Arnold, University of Edinburgh Louise Berben, University of California, Davis Akkattu T. Biju, Indian Institute of Science, Bangalore

Penny Brothers, Australian National University Wesley Browne, University of Groningen Raffaella Buonsanti, EPFL

Hong Chen, Soochow University Xiao-Ming Chen, Sun Yat-Sen University Arindam Chowdhury, Indian Institute of Technology Bombay

Derrick Clive, University of Alberta Seth Cohen, University of California, San Diego Marcetta Darensbourg, Texas A&M University Jyotirmayee Dash, Indian Association for the Cultivation of Science

Gautam R. Desiraju, Indian Institute of Science, Bangalore

Abhishek Dey, Indian Association for the Cultivation of Science (IACS) Josh Figueroa, University of California, San Diego

Lutz Gade, University of Heidelberg Sujit Ghosh, Indian Institute of Science Education of Research, India

Robert Gilliard Jr., Massachusetts Institute of Technology, USA

David Gonzalez-Rodriguez, Autonomous University of Madrid Rebecca Goss, University of St Andrews

Mike Greaney, University of Manchester

Shaojun Guo, Peking University Michaele Hardie, University of Leeds Amanda Hargrove, Duke University Hongyan He, Institute of Process Engineering, Chinese Academy of Sciences, China Eva Hevia, University of Bern, Switzerland Feihe Huang, Zhejiang University Todd Hudnall, Texas State University Ilich A. Ibarra Alvarado, National University of Mexico

Aieet Kaushik, Florida Polytechnic University Jong Seung Kim, Korea University Shu Kobayashi, University of Tokyo Mi Hee Lim, Ulsan National Institute of Science and Technology (UNIST) Teck-Peng Loh, Nanyang Technological University

Tien-Yau Luh, National Taiwan University Doug MacFarlane, Monash University Hiromitsu Maeda Ritsumeikan University Silvia Marchesan, University of Trieste Nazario Martin, Complutense University of

Alexander Miller, University of North Carolina at Chapel Hill Wonwoo Nam, Ewha Womans University

Kenneth Ozoemena, University of the Witwatersrand Johannesburg Thalappil Pradeep, Indian Institute of Technology Madras

S Ramakrishnan, Indian Institute of Science Erwin Reisner, University of Cambridge Robin Rogers, McGill University

Ilhyong Ryu, Osaka Metropolitan University & NYCU

Paolo Samori, University of Strasbourg David Scanlon, University of Birmingham Ellen Sletten, University of California, Los Angeles

David Smith, University of York Mizuki Tada, Nagoya University Zhong-Qun Tian, Xiamen University, China Tan Tianwei, Beijing University of Chemical Technology

Tomas Torres, Autonomous University of Madrid

Judy Wu, University of Houston Yi Xie, University of Science and Technology

Xianran Xing, University of Science and Technology Beijing

Shuli You, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences Yan Yu, University of Science and Technology of China

Fan Zhang, Fudan University Qiang Zhang, Tsinghua University Xi Zhang, Tsinghua University Wenwan Zhong, University of California, Riverside

Eli Zvsman-Colman, University of St. Andrews

Information for Authors

Full details on how to submit material for publication in Chemical Communications are given in the Instructions for Authors (available from http://www.rsc.org/authors).

Submissions should be made via the journal's homepage:

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 of Chemistry.

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.

 $\ensuremath{\boldsymbol{\otimes}}$ The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

Registered charity number: 207890

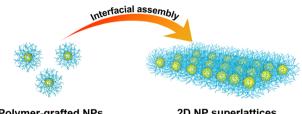


FEATURE ARTICLES

14223

2D superlattices via interfacial self-assembly of polymer-grafted Au nanoparticles

Liangzhu Jiang, Xi Mao, Changxu Liu, Xiaodan Guo, Renhua Deng* and Jintao Zhu*



Polymer-grafted NPs

2D NP superlattices

14236

Dynamic supramolecular hydrogels mediated by chemical reactions

Jingjing Chen, Hucheng Wang, Feng Long, Shengyu Bai and Yiming Wang*



COMMUNICATIONS

14249

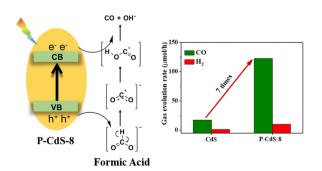
Development of 3-triazenylaryne and its application to iterative aryne reactions via o-triazenylarylboronic acids

Motoki Ito,* Yuta Takishima, Rinto Ishikawa, Mao Kamimura, Hana Watanabe, Takehiro Konishi, Kazuhiro Higuchi and Shigeo Sugiyama*

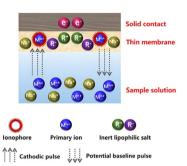
14253

Boosting photocatalytic conversion of formic acid to CO over P-doped CdS

Pengfei Feng, Junhao Wu, Zimeng Fan, Baochun Ma, Yuanyuan Li,* Xiangyu Meng* and Yong Ding*



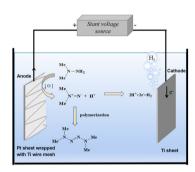
14257



Trace-level chronopotentiometric detection in the presence of a high electrolyte background using thin-layer ion-selective polymeric membranes

Jinghui Li, Wenting Zhang and Wei Qin*

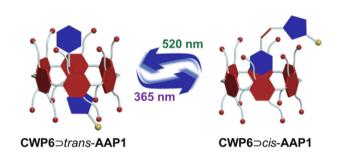
14261



An environment friendly electrochemical synthesis of 1,1,4,4-tetramethyl-2-tetrazene energetic materials from undimethylhydrazine

Qi Xue, Mi Zhang, Liang He, Fu-Qing Bi,* Bo-Zhou Wang* and Bin Liu*

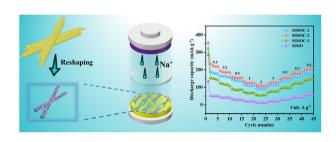
14265



Arylazopyrazole as a photo-switch for controllable self-assembly of pillar[6]arene-based supramolecular amphiphiles

Yishu Yu, Xiaotian Qu, Junran Li, Feihe Huang* and Jie Yang*

14269



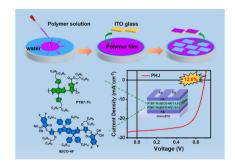
Reshaping carbon-coated Mn₂Mo₃O₈ nanotubes and enhanced sodium storage performance

Lifeng Zhang,* Liyue Xue, Jiaxi Bai, Kexin He and Bangmei Lu*

14273

Spontaneously spreading film process to improve the photovoltaic performance of organic solar cells with PHJ structure

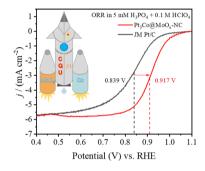
Yetai Cheng, Xiaodong Wang, Zengliang Pei, Ya-nan Chen, Hao Lu,* Yahui Liu* and Zhishan Bo*



14277

A phosphate tolerant Pt-based oxygen reduction catalyst enabled by synergistic modulation of alloying and surface modification

Daojun Long, Zhenyang Xie, Minjian Wang, Siguo Chen* and Zidong Wei



14281

Intramolecular C-N bond activation by a transient boryl anion

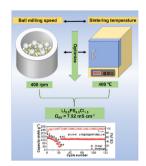
Emily E. Nahon, Gareth R. Nelmes, Penelope J. Brothers and Jamie Hicks*



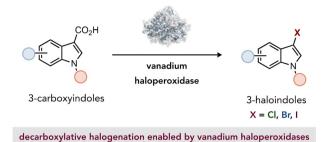
14285

Optimizing milling and sintering parameters for mild synthesis of highly conductive Li_{5.5}PS_{4.5}Cl_{1.5} solid electrolyte

Tianyu Lei, Linfeng Peng, Cong Liao, Shuai Chen, Shijie Cheng and Jia Xie*



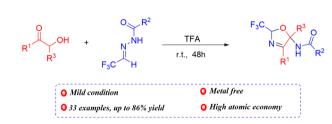
14289



Decarboxylative halogenation of indoles by vanadium haloperoxidases

Lauren J. Harstad, Clare E. Wells, Hyung Ji Lee, Lauren P. T. Ramos, Manik Sharma, Cameron A. Pascoe and Kyle F. Biegasiewicz*

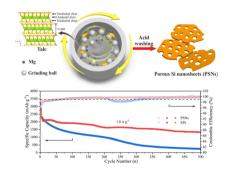
14293



The cyclization/rearrangement of α -hydroxy ketones with trifluoromethyl N-acylhydrazones to synthesize multi-substituted trifluoromethyloxazolines

Junjiao Wang,* Yongwei Shang, Xiujuan Zhao, Zhenli Cui, Yang Li, Ke-Hu Wang, Danfeng Huang, Yulai Hu,* Na Wang and Lei Feng

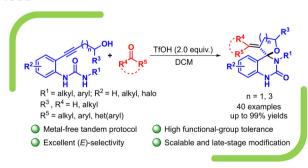
14297



Mechanochemical reduction of clay minerals to porous silicon nanoflakes for high-performance lithium-ion battery anodes

Qingze Chen, Shoushu Wei, Runliang Zhu,* Jing Du, Jieyang Xie, Haiming Huang, Jianxi Zhu and Zhengxiao Guo

14301



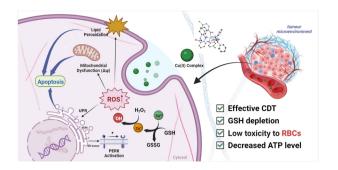
Leveraging cascade alkynyl Prins cyclization towards the stereoselective synthesis of spiro-furan quinazolinone scaffolds

Subhamoy Biswas, Sudip Shit, Bipin Kumar Behera, Archana Kumari Sahu and Anil K. Saikia*

14305

Concurrent Cu(II)-initiated Fenton-like reaction and glutathione depletion to escalate chemodynamic therapy

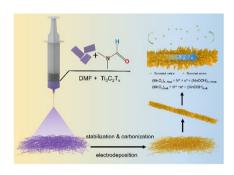
Ashwini Kumar, Ayushi Chaudhary, Bhumika Agrahari, Kajal Chaudhary, Pooran Kumar and Ritika Gautam Singh*



14309

Ti₃C₂T_x MXene-embedded MnO₂-based hydrophilic electrospun carbon nanofibers as a freestanding electrode for supercapacitors

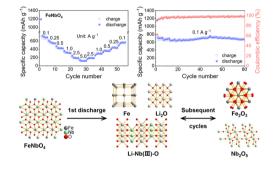
Zhaorui Wang, Deyang Zhang,* Ying Guo, Hao Jiang, Di Wang, Jinbing Cheng,* Paul K. Chu, Hailong Yan and Yongsong Luo*



14313

FeNbO₄ nanochains with a five-electron transfer reaction toward high capacity and fast Li storage

Yingxue Cui, Zixuan Zhou, Sheng Li, Rong Kang, Yun Zhang, Wei Wei, Jiabiao Lian,* Shanhai Ge* and Huaming Li*

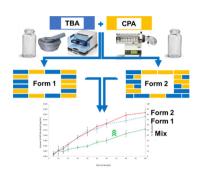


14317

Creating glassy states of dicarboxylate-bridged coordination polymers

Zeyu Fan, Yong-Sheng Wei, Chinmoy Das, Kazuyoshi Kanamori, Hiroki Yamada, Koji Ohara and Satoshi Horike*

14321



Solid solution polymorphs afford two highly soluble co-drug forms of tolbutamide and chlorpropamide

Enrico Spoletti, Vivek Verma, Chiara Cappuccino and Matteo Lusi*

14325

Synthesis of 3-aminoindenes and cis-1-aminoindanes by Zn(OTf)2-catalyzed cyclization of o-alkynylbenzaldehydes with tertiary alkyl primary amines

Tuanli Yao,* Rui Zhu and Tao Liu