

## IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS 59(92) 13659-13780 (2023)



### Cover

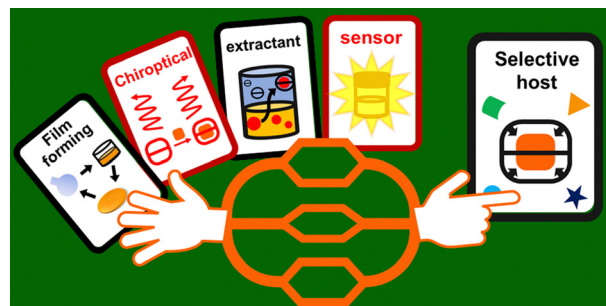
See Huatang Zhang,  
Yin Jiang,  
Hongyan Sun *et al.*,  
pp. 13703-13706.  
Image reproduced  
by permission of  
Huatang Zhang from  
*Chem. Commun.*,  
2023, 59, 13703.

## FEATURE ARTICLES

13668

### Recent applications of organic cages in sensing and separation processes in solution

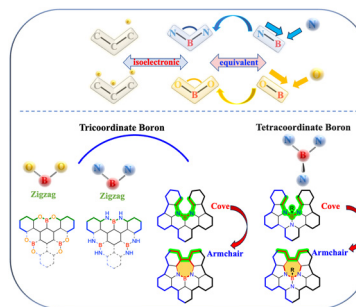
Sonia La Cognata and Valeria Amendola\*



13679

### Heteroatom-boron-heteroatom-doped $\pi$ -conjugated systems: structures, synthesis and photofunctional properties

Tinghao Ma, Jiaqi Dong and Deng-Tao Yang\*



## Editorial Staff

### Executive Editor

Richard Kelly

### Deputy Editor

Harriet Riley

### Editorial Production Manager

Helen Saxton

### Development Editors

Danny Andrews, Ershad Abubacker

### Senior Publishing Editor

Becky Webb

### 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

Jade 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](mailto:chemcomm@rsc.org)

For pre-submission queries please contact Richard Kelly, Executive Editor. Email [chemcomm-rsc@rsc.org](mailto: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](mailto: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](http://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](mailto:advertising@rsc.org)

For marketing opportunities relating to this journal, contact [marketing@rsc.org](mailto:marketing@rsc.org)

# ChemComm

Chemical Communications

[rsc.li/chemcomm](http://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  
Michael 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  
Michael 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  
Ajeet 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 Madrid  
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 of China  
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 Zysman-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: [rsc.li/chemcomm](http://rsc.li/chemcomm)

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.

© The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

Registered charity number: 207890

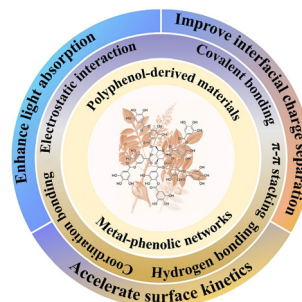


## FEATURE ARTICLES

13690

## Functions of metal–phenolic networks and polyphenol derivatives in photo(electro)catalysis

Xiao-Long Liu, Hai-Chao Wang, Tao Yang, Xin-Zheng Yue and Sha-Sha Yi\*

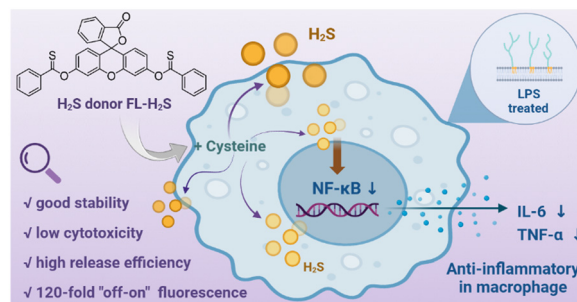


## COMMUNICATIONS

13703

A new dual functional H<sub>2</sub>S donor for fluorescence imaging and anti-inflammatory application

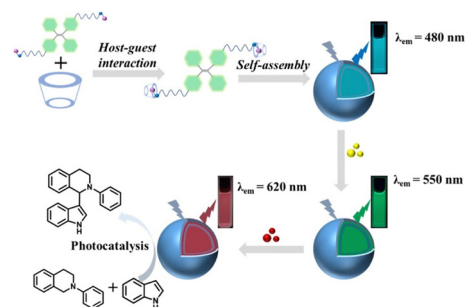
Shumei Huang, Zejun Li, Wenhui You, Guansheng Zheng, Huatang Zhang,\* Yin Jiang\* and Hongyan Sun\*



13707

## A cavitand-based supramolecular artificial light-harvesting system with sequential energy transfer for photocatalysis

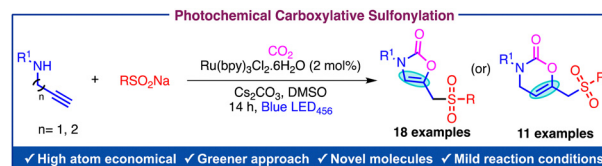
Qian Liu, Minzan Zuo, Kaiya Wang\* and Xiao-Yu Hu\*



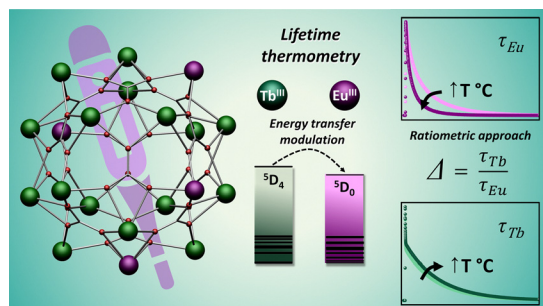
13711

Visible-light-induced bifunctionalisation of (homo)propargylic amines with CO<sub>2</sub> and arylsulfinates

Mandapati Bhargava Reddy and Eoghan M. McGarrigle\*



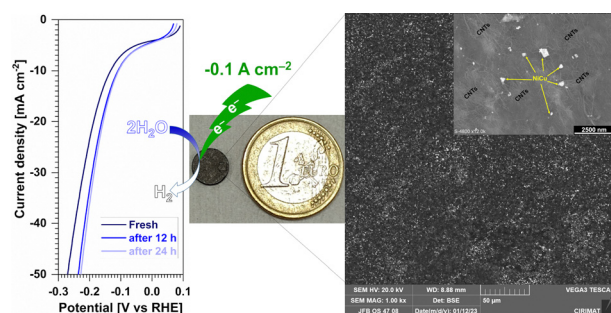
13715



### Intra-cluster energy transfer editing in a dual-emitting system to tap into lifetime thermometry

Claudia Manuela Santos Calado, Diogo Alves Gálico and Muralee Murugesu\*

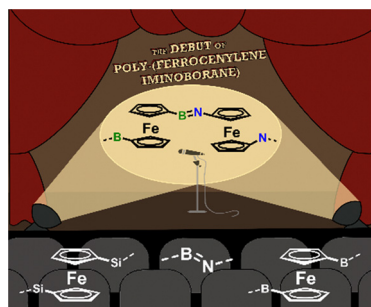
13719



### Spark plasma sintered catalytic nickel–copper alloy and carbon nanotube electrodes for the hydrogen evolution reaction

Jean-Félix Boué, Cédric Espinet, Simon Amigues, David Mesguich, David Cornu, Yaovi Holade,\* Julien Cambedouzou\* and Christophe Laurent\*

13723



### Poly(ferrocenylene iminoborane): an inorganic–organic hybrid polymer comprising a backbone of moderately interacting ferrocenes

Vivien Zeh, Johannes S. Schneider, Jonas Bachmann, Ivo Krummenacher, Holger Braunschweig and Holger Helten\*

13727



### Carborane-based heteromolecular extended networks driven by directional C–Te···N chalcogen bonding interactions

Maxime Beau, Olivier Jeannin, Marc Fourmigué,\* Emmanuel Aubert, Enrique Espinosa, Sunhee Lee, Won-Sik Han and le-Rang Jeon\*

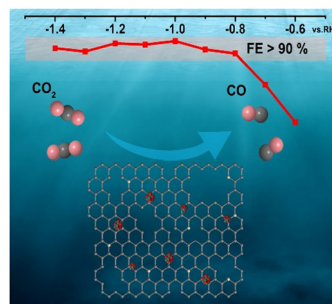


## COMMUNICATIONS

13731

### Facile synthesis of supported CuNi nano-clusters as an electrochemical CO<sub>2</sub> reduction catalyst with broad potential range

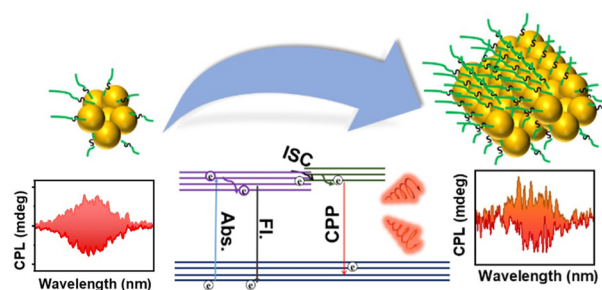
Jiale Wang, Fan Li, Runhua Li, Qian Xiang,  
Wencong Zhang, Chengyi Song, Peng Tao,  
Wen Shang, Tao Deng, Hong Zhu and Jianbo Wu\*



13735

### Dual emissive optically active gold nanoclusters endowed with circularly polarized phosphorescence

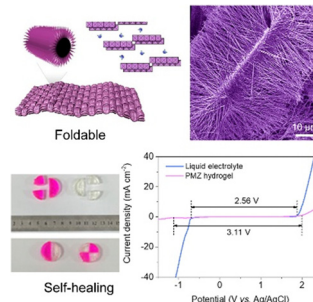
Camelia Dutta, Sonia Maniappan and Jatish Kumar\*



13739

### A foldable self-healing rocking chair zinc-ion battery using a three-dimensional zinc metal-free anode

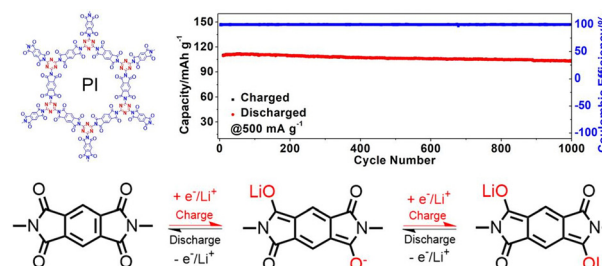
Jiawei Long, Tianli Han, Xirong Lin, Yajun Zhu and  
Jinyun Liu\*



13743

### Fabrication of porous polyimide as cathode for high performance lithium-ion battery

Xianyu Liu,\* Mingxun Xie, Yunxia Wei, Yongliang Guo  
and Zheng Liu

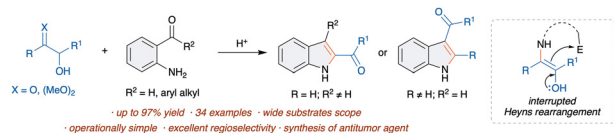




13747

## An interrupted Heyns rearrangement approach for the regioselective synthesis of acylindoles

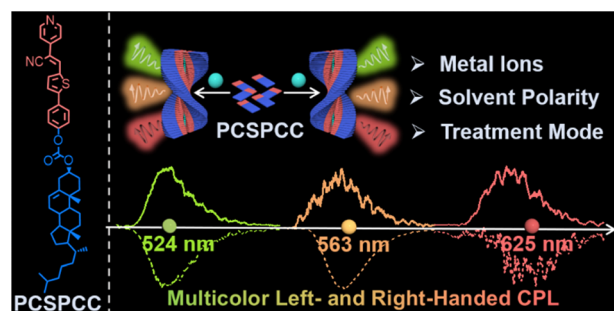
Minakshi Altia and Pazhamalai Anbarasan\*



13751

## Multicolor circularly polarized luminescence inversion of metal–organic supramolecular polymers

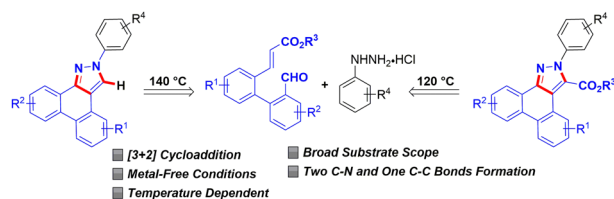
Kuo Fu and Guofeng Liu\*



13755

## Transition metal-free and temperature dependent one-pot access to phenanthrene-fused heterocycles via a 1,3-dipolar cycloaddition pathway

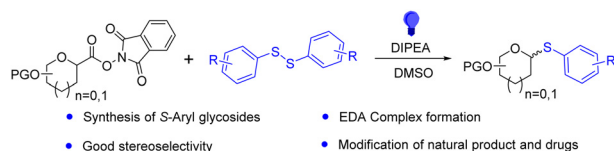
Mokilla Ramachandra Reddy, Eerappa Rajakumara and Gedu Satyanarayana\*



13759

## Visible-light-mediated synthesis of non-anomeric S-aryl glycosides via a photoactive electron-donor–acceptor complex

Le Zhang, Shiyun He, Jinyu Hou, Meiling Ye, Jian Chen, Guanghui Lv, Tianle Huang, Zhongzhen Yang\* and Yong Wu\*

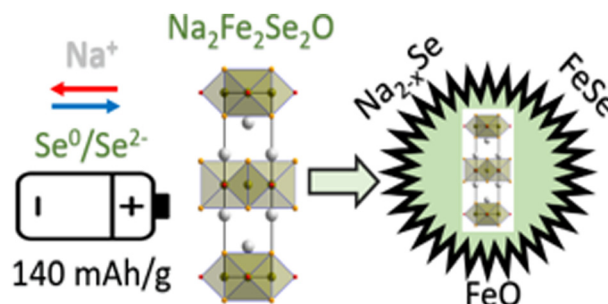


## COMMUNICATIONS

13763

**Na<sub>2</sub>Fe<sub>2</sub>Se<sub>2</sub>O: a double anti-perovskite with prevalence of anionic redox activity in Na-ion batteries**

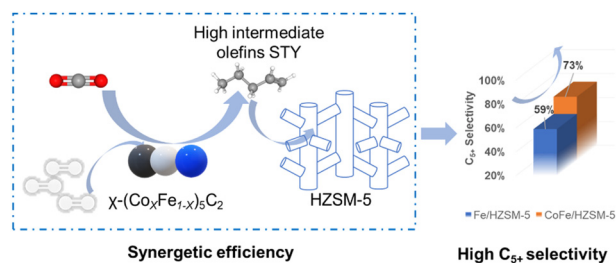
Mikhail V. Gorbunov,\* Thomas Doert and Daria Mikhailova



13767

**Bifunctional CoFe/HZSM-5 catalysts orient CO<sub>2</sub> hydrogenation towards liquid hydrocarbons**

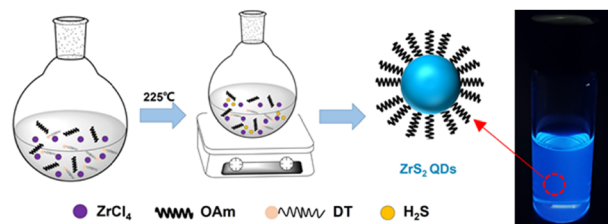
Kai Wang, Na Liu, Jian Wei,\* Yang Yu, Jixin Zhang, Joshua Iseoluwa Orege, Lifei Song, Qingjie Ge and Jian Sun\*



13771

**Facile synthesis of wide bandgap ZrS<sub>2</sub> colloidal quantum dots for solution processed solar-blind UV photodetectors**

Zan Wang, Yunjiao Gu, Fenghua Liu and Weiping Wu\*



13775

**A high-performance crystalline Ti<sub>2</sub>O<sub>1.3</sub>(PO<sub>4</sub>)<sub>1.6</sub>/TiO<sub>2</sub> carbon-coated composite as an anode for lithium-ion batteries**

Yayun Zheng, Yuefo Yi, Ziyi Yang, Wenbin Zhou, Yichao Wang and Zhengfei Chen\*

