Chemical Science

rsc.li/chemical-science

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 2041-6539 CODEN CSHCBM 14(17) 4437-4654 (2023)



Cover

See Tsuneomi Kawasaki et al., pp. 4480-4484. Image reproduced by permission of Tsuneomi Kawasaki from Chem. Sci., 2023, 14, 4480.



Inside cover

See Mingoo Jin, Hajime Ito et al., pp. 4485-4494. Image reproduced by permission of Alexander S. Mikherdov, Mingoo Jin and Hajime Ito from Chem. Sci., 2023, 14,

EDITORIAL

4447

How can you trust what you read?

May C. Copsey and Andrew I. Cooper

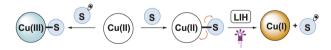


PERSPECTIVES

4449

Light-induced homolysis of copper(II)-complexes a perspective for photocatalysis

Alexander Reichle and Oliver Reiser*



Editorial Staff

Executive Editor

May Copsey

Deputy Editor

Samantha Apps

Senior Editor

James Moore

Scientific Editors

Ellis Crawford, Jingtao Huang, Esther Johnston, Sophie Orchard, Richard Thompson and Amy Welch

Editorial Assistant Karina Webster

Publishing Assistant David Bishop

For queries about submitted articles please contact James Moore, Senior Editor, in the first instance. E-mail chemicalscience@rsc.org

For pre-submission queries please contact May Copsey, Executive Editor.

E-mail chemicalscience-rsc@rsc.org

Chemical Science (electronic: ISSN 2041-6539) is published 48 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK.

Chemical Science is a Gold Open Access journal and all articles from 2015 onwards are free to read.

Please email orders@rsc.org to register your interest or contact 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

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

Chemical Science

rsc.li/chemical-science

Editorial Board

Editor-in-Chief

Andrew Cooper, University of Liverpool

Associate Editors

Vincent Artero, CEA-Grenoble Luis M. Campos, Columbia University Michelle Chang, University of California,

Lin X. Chen. Northwestern University Graeme Day, University of Southampton Serena DeBeer, Max Planck Institute for Chemical Energy Conversion

Mircea Dincă MIT Vy Dong, University of California, Irvine François Gabbaï, Texas A&M University Subi George, JNCASR Jinlong Gong, Tianjin University Stephen Goldup, University of Birmingham Zaiping Guo, University of Adelaide Christopher A. Hunter, University of Cambridge

Malika Jefferies-EL, Boston University Ning Jiao, Peking University Tanja Junkers, Monash University

Hemamala Karunadasa, Stanford University Maja Köhn, University of Freiburg Yi-Tao Long, Nanjing University Gabriel Merino, CINVESTAV Merida James K. McCusker, Michigan State University Thomas Meade, Northwestern University Paolo Melchiorre, University of Bologna Carsten Schultz, Oregon Health & Science University Dmitri Talanin The University of Chicago

Toshiharu Teranishi, Kyoto University Andrei Yudin, University of Toronto

Advisory Board

Dave Adams, University of Glasgow Ayyappanpillai Ajayaghosh, NIIST Ulf-Peter Apfel, Ruhr-University Bochum Polly Arnold, University of California, Berkeley Xinhe Bao, Dalian Institute of Chemical

Zhenan Bao, Stanford University Gonçalo Bernardes, University of Cambridge Frank Biedermann, Karlsruhe Institute of Technology

Donna Blackmond, Scripps Research Institute Jeffrey Bode, ETH Zurich Jennifer S. Brodbelt, University of Texas at

Austin, USA Christopher Chang, University of California,

Chi-Ming Che, University of Hong Kong Jun Chen, Nankai University R. Graham Cooks, Purdue University Christophe Copéret, ETH Zurich Eugenio Coronado, University of Valencia Leroy Cronin, University of Glasgow James Crowley, University of Otago Christopher C. Cummins, Massachusetts Institute of Technology Ben Davis, University of Oxford Jillian Dempsey, University of North Carolina

at Chapel Hill Kazunari Domen, University of Tokyo James Durrant, Imperial College London Xinlang Feng, TU Dresden Ben Feringa, University of Groningen Makoto Fujita, University of Tokyo Phillip Gale, University of Technology Sydney

Song Gao, Peking University Jeremiah Gassensmith, University of Texas at Dalls Elizabeth Gibson, Newcastle University Ryan Gilmour, WWU Münster

Hubert Girault, EPFL Frank Glorius, WWU Münster Leticia González, University of Vienna Duncan Graham, University of Strathclyde Vicki Grassian, University of California, San Diego

Alexis Grimaud, Boston College Christian Hackenberger, FMP Berlin Buxing Han, Chinese Academy of Sciences Christy Haynes, University of Minnesota Patrick Holland, Yale University Kim Jelfs, Imperial College London Yousung Jung, KAIST

Stephanie Kath-Schorr, University of Cologne Takashi Kato, University of Tokyo Christopher Kelly, Janssen Research & Development

Jérôme Lacour, University of Geneva Ai-Lan Lee, Heriot-Watt University Daniele Leonori, RWTH Aachen University Chao-Jun Li, McGill University Yi Li, Jilin University Mi Hee Lim, KAIST Wenbin Lin, University of Chicago Kopin Liu, Academia Sinica Watson Loh, UNICAMP

Bettina Lotsch, Max Planck Institute Xiong Wen (David) Lou, Nanyang Technological University Kazuhiko Maeda, Tokyo Institute of Technology Satoshi Maeda, Hokkaido University

Swadhin Mandal, IISER Kolkata Ellen Matson, University of Rochester Scott Miller, Yale University Daniel Mindiola, University of Pennsylvania Wonwoo Nam, Ewha Womans University Jonathan Nitschke, University of Cambridge Allie Obermeyer, Columbia University Martin Oestreich, Technical University of

Takashi Ooi, Nagoya University Rachel O'Reilly, University of Birmingham Oleg Ozerov, Texas A&M University Xiulian Pan, Dalian Institute of Chemical

Berlin

Nicolas Plumeré, Technical University of

Munich

Rasmita Raval, University of Liverpool Erwin Reisner, University of Cambridge Andrea Rentmeister, WWU Münster Jeffrey Rinehart, University of California, San Diego

Stuart Rowan, University of Chicago Richmond Sarpong, University of California, Berkeley

Danielle Schultz, Merck Dwight Seferos, University of Toronto Oliver Seitz, Humboldt University of Berlin Roberta Sessoli, University of Florence Kay Severin, Federal Polytechnic School of

Mikiko Sodeoka, RIKEN Galo Soler-Illia, Universidad Nacional de San

David Spring, University of Cambridge Brian Stoltz, California Institute of Technology Brent Sumerlin, University of Florida Raghavan B. Sunoj, IIT Bombay Yogesh Surendranath, MIT Mizuki Tada, Nagoya University Ben Zhong Tang, The Hong Kong University of Science and Technology Zhiyong Tang, National Center for

Nanoscience and Nanotechnology Christine Thomas, Ohio State University He Tian, East China University of Science & Technology Zhong-Qun Tian, Xiamen University

F. Dean Toste, University of California, Berkley Takashi Uemura, University of Tokyo Jan van Hest, Radboud University Latha Venkataraman, Columbia University Chu Wang, Peking University Julia Weinstein, University of Sheffield Tom Welton, Imperial College London Charlotte Williams, University of Oxford Vivian Yam, University of Hong Kong Qi-Lin Zhou, Nankai University Jenny Zhang, University of Cambridge

Information for Authors

Full details on how to submit material for publication in Chemical Science 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/chemical-science

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.

Registered charity number: 207890

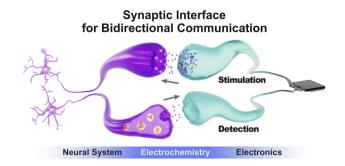


PERSPECTIVES

4463

Streamlining the interface between electronics and neural systems for bidirectional electrochemical communication

Wonkyung Cho, Sun-heui Yoon and Taek Dong Chung*

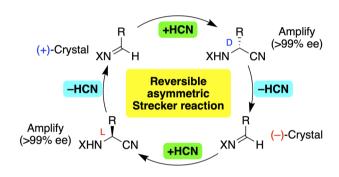


EDGE ARTICLES

4480

Chirally and chemically reversible Strecker reaction

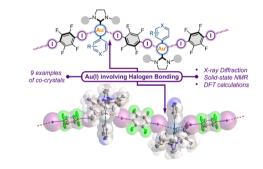
Yutaro Machida, Yudai Tanaka, Yuya Masuda, Aya Kimura and Tsuneomi Kawasaki*



4485

Exploring Au(1) involving halogen bonding with Nheterocyclic carbene Au(ı) aryl complexes in crystalline media

Alexander S. Mikherdov, Mingoo Jin* and Hajime Ito*



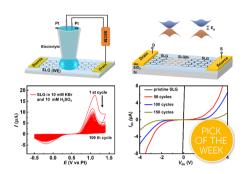
4495

Development of fluorogenic substrates for colorectal tumor-related neuropeptidases for activity-based diagnosis

Norimichi Nagano, Yuki Ichihashi, Toru Komatsu,* Hiroyuki Matsuzaki, Keisuke Hata, Toshiaki Watanabe, Yoshihiro Misawa, Misa Suzuki, Shingo Sakamoto, Yu Kagami, Ayumi Kashiro, Keiko Takeuchi, Yukihide Kanemitsu, Hiroki Ochiai, Rikiya Watanabe, Kazufumi Honda and Yasuteru Urano*



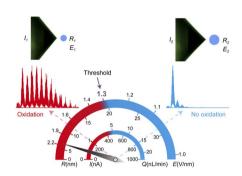
4500



Electrochemical regulation of the band gap of single layer graphene: from semimetal to semiconductor

Lanping Zeng, Weiying Song, Xiangfeng Jin, Quanfeng He, Lianhuan Han,* Yuan-fei Wu, Corinne Lagrost, Yann Leroux, Philippe Hapiot, Yang Cao,* Jun Cheng and Dongping Zhan*

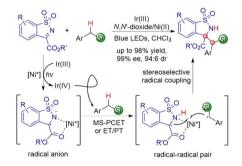
4506



Tuning oxidative modification by a strong electric field using nanoESI of highly conductive solutions near the minimum flow rate

Zhongbao Han, Nozomu Omata, Takeshi Matsuda, Shoki Hishida, Shuuhei Takiguchi, Ryoki Komori, Riku Suzuki and Lee Chuin Chen'

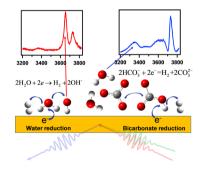
4516



Visible-light-induced chemo-, diastereo- and enantioselective α -C(sp³)-H functionalization of alkvl silanes

Lili Feng, Xiaofan Chen, Ning Guo, Yuqiao Zhou, Lili Lin, Weidi Cao* and Xiaoming Feng*

4523



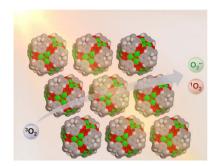
Direct observation of bicarbonate and water reduction on gold: understanding the potential dependent proton source during hydrogen evolution

Gang-Hua Deng, Quansong Zhu, Jaclyn Rebstock, Tomaz Neves-Garcia and L. Robert Baker*

4532

A copper-seamed coordination nanocapsule as a semiconductor photocatalyst for molecular oxygen activation

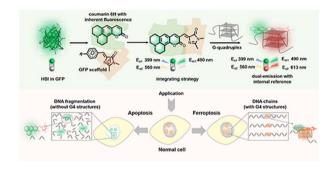
Xiangquan Hu, Meirong Han, Leicheng Wang, Li Shao, Yadav Peeyush, Jialei Du,* Steven P. Kelley, Scott J. Dalgarno, David A. Atwood, Sisi Feng* and Jerry L. Atwood*



4538

Engineering fluorescent protein chromophores with an internal reference for high-fidelity ratiometric G4 imaging in living cells

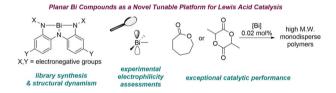
Jiao-Na Han, Caijun Zhong, Mingmin Ge, Shi Kuang* and Zhou Nie*



4549

Planar bismuth triamides: a tunable platform for main group Lewis acidity and polymerization catalysis

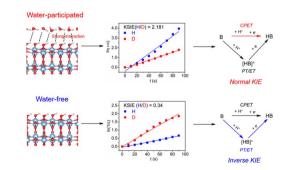
Tyler J. Hannah, W. Michael McCarvell, Tamina Kirsch, Joseph Bedard, Toren Hynes, Jacqueline Mayho, Karlee L. Bamford, Cyler W. Vos, Christopher M. Kozak, Tanner George, Jason D. Masuda and S. S. Chitnis*



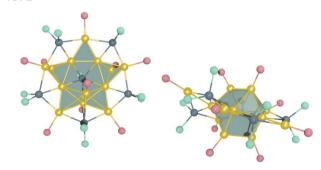
4564

Water molecule switching heterogeneous protoncoupled electron transfer pathway

Zhonghuan Liu, Wei Peng, Yuhan Lin, Xinyu Lin, Shikang Yin, Shuhan Jia, Dongge Ma, Yan Yan,* Peng Zhou,* Wanhong Ma* and Jincai Zhao



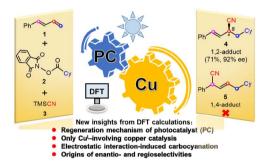
4571



Synthesis and characterisation of four bimetallic gold-gallium clusters with Au-Ga rings as a new structural motif in gold cluster chemistry

Markus Strienz, Florian Fetzer and Andreas Schnepf*

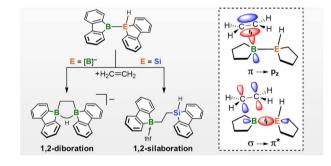
4580



New insights into the mechanism of synergetic photoredox/copper(i)-catalyzed carbocyanation of 1,3-dienes: a DFT study

Yanhong Liu, Aili Feng, Rongxiu Zhu and Dongju Zhang*

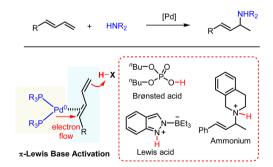
4589



Catalyst-free diboration and silaboration of alkenes and alkynes using bis(9-heterofluorenyl)s

Jannik Gilmer, Timo Trageser, Luis Čaić, Alexander Virovets, Michael Bolte, Hans-Wolfram Lerner, Felipe Fantuzzi* and Matthias Wagner*

4597



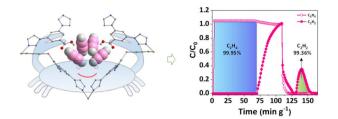
A metal π -Lewis base activation model for Pd-catalyzed hydroamination of amines and 1,3-dienes

Xiao Yan, Xiu-Ming Yang, Peng Yan, Bo Zhao, Rong Zeng, Bin Pan, Ying-Chun Chen, Lei Zhu* and Qin Ouyang*

4605

Formation and fine-tuning of metal—organic frameworks with carboxylic pincers for the recognition of a C_2H_2 tetramer and highly selective separation of C_2H_2/C_2H_4

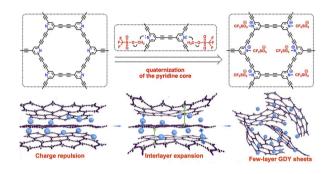
Yuefeng Duan, Yuhang Huang, Chongqing Wang, Qian Wang, Kai Ge, Zhiyong Lu, Huijie Wang, Jingui Duan,* Junfeng Bai* and Wanqin Jin



4612

Scalable synthesis of soluble crystalline ionicgraphdiyne by controlled ion expansion

Lingling Wang, Lu Qi, Qinglei Zhang, Binghui Xue, Zhiqiang Zheng, Panchao Yin, Yurui Xue, Wenlong Yang* and Yuliang Li*



4620

Single-atom copper catalyst for the S-arylation reaction to produce diaryl disulfides

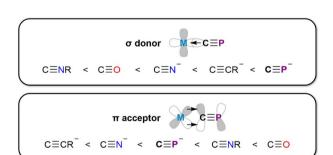
Yiming Zhao, Yan Zhou, Shanshan Lv, Han Li, Qikang Wu, Shaohuan Liu, Wanying Li, Taiyu Chen and Zheng Chen*



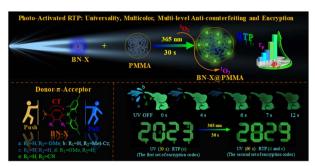
4627

Putting cyaphide in its place: determining the donor/acceptor properties of the κC -cyaphido ligand

Eric S. Yang, Emma Combey and Jose M. Goicoechea*



4633



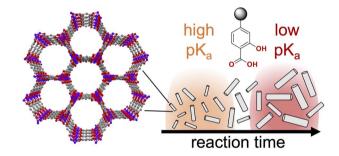
Time-dependent photo-activated aminoborane room-temperature phosphorescence materials with unprecedented properties: simple, versatile, multicolor-tuneable, water resistance, optical information writing/erasing, and multilevel data encryption

Huangting Ding, Yitong Sun, Meng Tang, Jingyi Wen, Shiwen Yue, Ye Peng, Fei Li, Liyan Zheng, Suning Wang, Yonggang Shi* and Qiue Cao*

Chiral spirosiladiphosphines: ligand development and applications in Rh-catalyzed asymmetric hydrosilylation/cyclization of 1,6-enynes with enhanced reactivity

Fei Hou, Minjie Liu, Tong Ru, Zequn Tan, Yingtang Ning* and Fen-Er Chen*

4647



Effect of modulator ligands on the growth of Co₂(dobdc) nanorods

Nina S. Pappas and Jarad A. Mason*