

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. Mikhherdov, Mingoo Jin and Hajime Ito from *Chem. Sci.*, 2023, **14**, 4485.

EDITORIAL

4447

How can you trust what you read?

May C. Copsey and Andrew I. Cooper

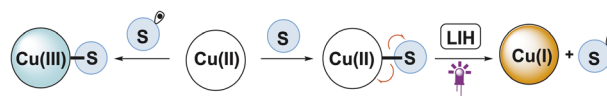


PERSPECTIVES

4449

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

Alexander Reichle and Oliver Reiser*



Editorial Staff

Executive Editor

May Copsy

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 Copsy, 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, Berkeley
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 Gabbai, 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 Talapin, 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 Physics
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, Berkeley
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
Jillan 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 Dallas
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
R. Graham Cooks, 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 Minciola, University of Pennsylvania
Wonwoo Nam, Ewha Womans University
Jonathan Nitschke, University of Cambridge
Allie Obermeyer, Columbia University
Martin Oestreich, Technical University of Berlin
Takashi Ooi, Nagoya University
Rachel O'Reilly, University of Birmingham
Oleg Ozerov, Texas A&M University
Xiulian Pan, Dalian Institute of Chemical Physics
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 Lausanne
Mikiko Sodeoka, RIKEN
Galo Soler-Illia, Universidad Nacional de San Martín
David Spring, University of Cambridge
Brian Stoltz, California Institute of Technology
Brent Sumriner, 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, Berkeley
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

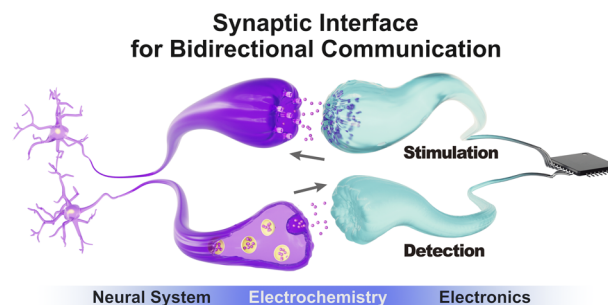


PERSPECTIVES

4463

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

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

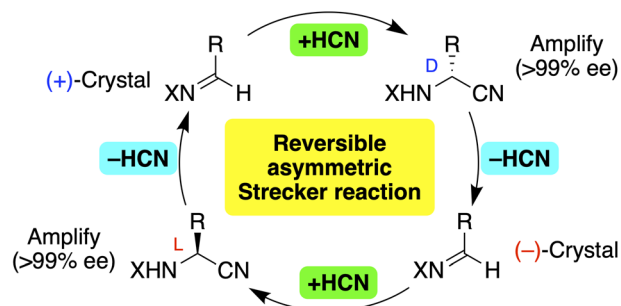


EDGE ARTICLES

4480

Chirally and chemically reversible Strecker reaction

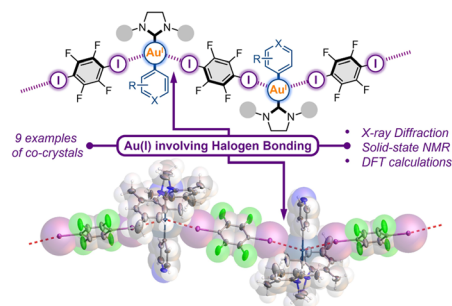
Yutaro Machida, Yudai Tanaka, Yuya Masuda, Aya Kimura and Tsuneomi Kawasaki*



4485

Exploring Au(I) involving halogen bonding with N-heterocyclic carbene Au(I) aryl complexes in crystalline media

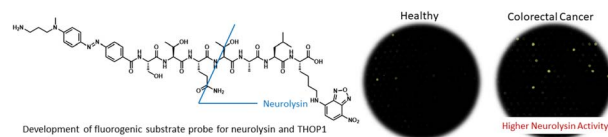
Alexander S. Mikherdov, Mingoo Jin* and Hajime Ito*



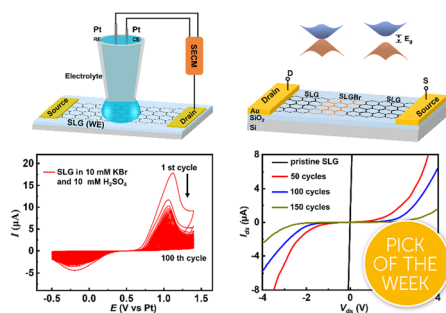
4495

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*



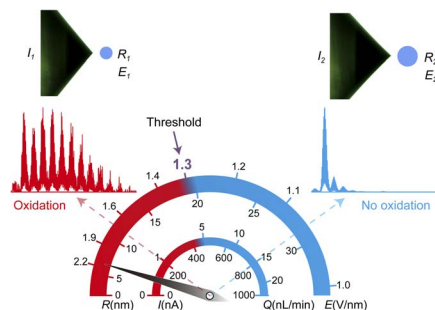
4500



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

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

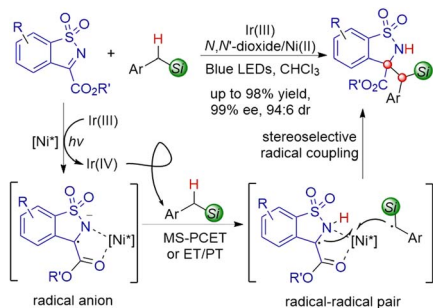
4506



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*

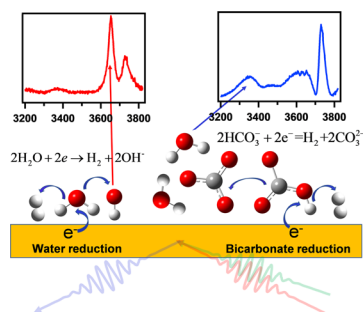
4516



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

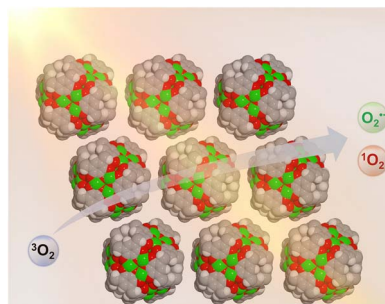
Gang-Hua Deng, Quansong Zhu, Jaclyn Rebstock, Tomaz Neves-Garcia and L. Robert Baker*



4532

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

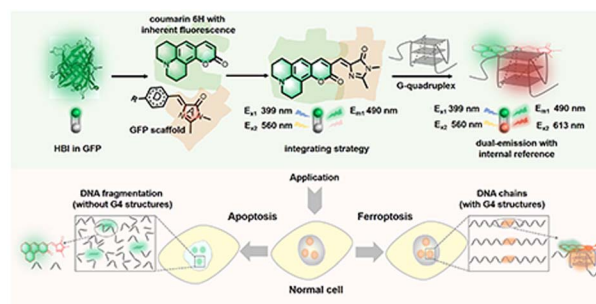
Xiangquan Hu, Meirong Han, Leicheng Wang, Li Shao, Yadav Peeyush, Jialei Du,* Steven P. Kelley, Scott J. Dalgarno, David A. Atwood, Sisi Feng* and Jerry L. Atwood*



4538

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

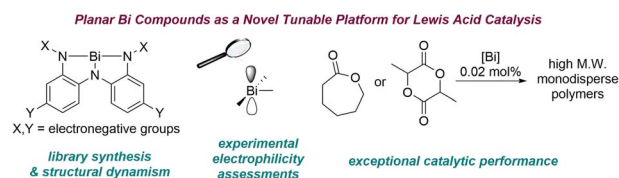
Jiao-Na Han, Caijun Zhong, Mingmin Ge, Shi Kuang* and Zhou Nie*



4549

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

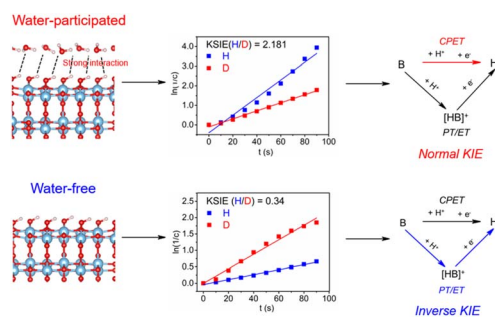
Tyler J. Hannah, W. Michael McCarvell, Tamina Kirsch, Joseph Bedard, Toren Hynes, Jacqueline Mayho, Karlee L. Bamford, Cyler W. Vos, Christopher M. Kozak, Tanner George, Jason D. Masuda and S. S. Chitnis*



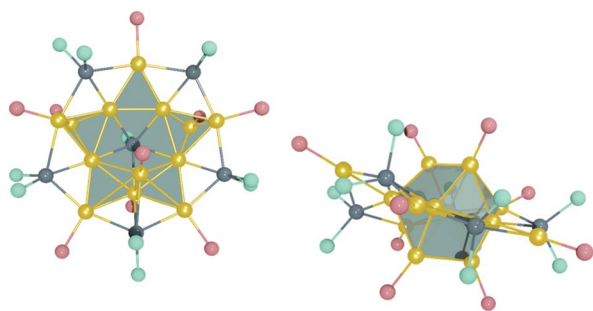
4564

Water molecule switching heterogeneous proton-coupled 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



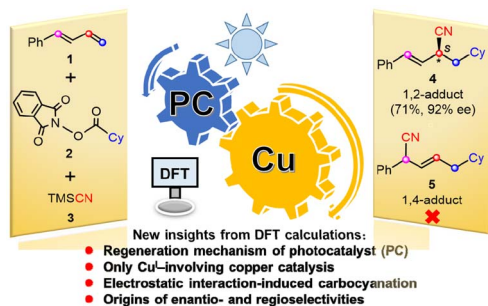
4571



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*

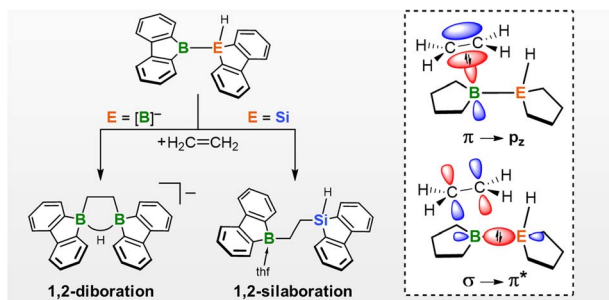
4580



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

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

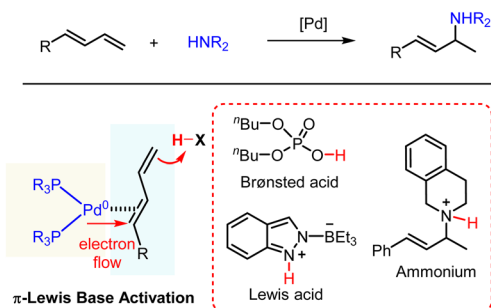
4589



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

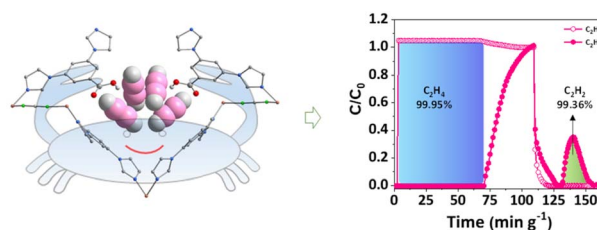
Xiao Yan, Xiu-Ming Yang, Peng Yan, Bo Zhao, Rong Zeng, Bin Pan, Ying-Chun Chen, Lei Zhu* and Qin Ouyang*



4605

Formation and fine-tuning of metal–organic frameworks with carboxylic pincers for the recognition of a C₂H₂ tetramer and highly selective separation of C₂H₂/C₂H₄

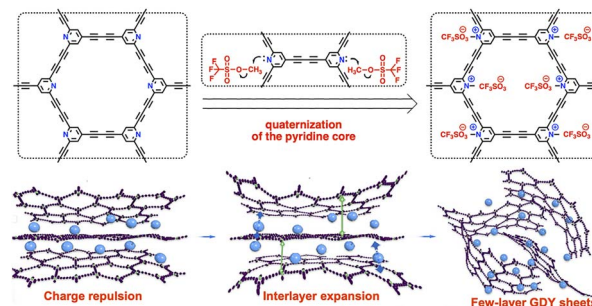
Yuefeng Duan, Yuhang Huang, Chongqing Wang, Qian Wang, Kai Ge, Zhiyong Lu, Huijie Wang, Jingui Duan,* Junfeng Bai* and Wanqin Jin



4612

Scalable synthesis of soluble crystalline ionic-graphdiyne by controlled ion expansion

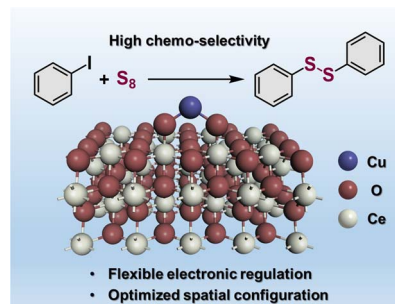
Lingling Wang, Lu Qi, Qinglei Zhang, Binghui Xue, Zhiqiang Zheng, Panchao Yin, Yurui Xue, Wenlong Yang* and Yuliang Li*



4620

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

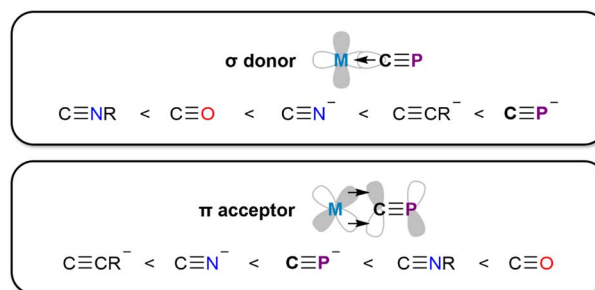
Yiming Zhao, Yan Zhou, Shanshan Lv, Han Li, Qikang Wu, Shaohuan Liu, Wanying Li, Taiyu Chen and Zheng Chen*



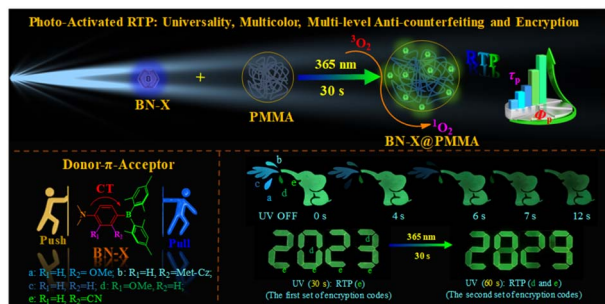
4627

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

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



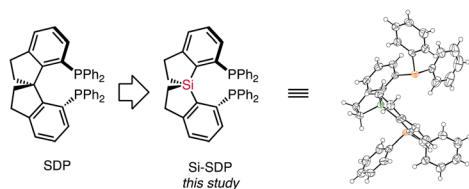
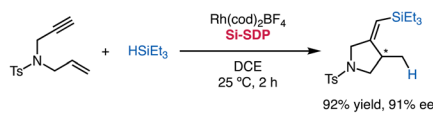
4633



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*

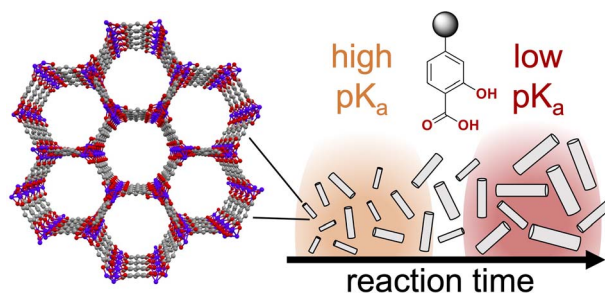
4641



Chiral spiroiladiphosphines: 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 $Co_2(dobdc)$ nanorods

Nina S. Pappas and Jarad A. Mason*

