

IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 6(6) 3273–3636 (2015)



Cover
See V. P. Ananikov *et al.*,
pp. 3302–3313.
Image reproduced by
permission of V. P. Ananikov
from *Chem. Sci.*,
2015, 6, 3302.



Inside cover
See Gilmar F. Salgado *et al.*,
pp. 3314–3320.
Image reproduced by
permission of
Gilmar F. Salgado from
Chem. Sci., 2015, 6, 3314.
Image modified with
permission from the original
"Boat in Storm" by Artem
Rhads Cheboha.

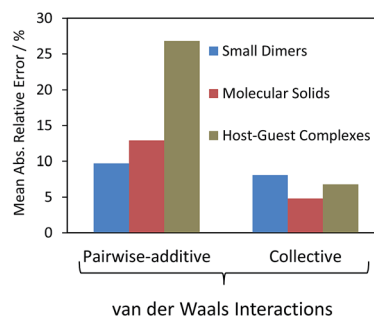
PERSPECTIVE

3289

van der Waals dispersion interactions in molecular materials: beyond pairwise additivity

Anthony M. Reilly and Alexandre Tkatchenko*

In this perspective we discuss recent advances in the understanding of collective and many-body van der Waals interactions and their role and impact for molecular materials.



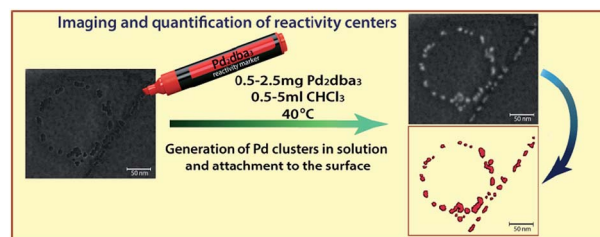
EDGE ARTICLES

3302

Spatial imaging of carbon reactivity centers in Pd/C catalytic systems

E. O. Pentsak, A. S. Kashin, M. V. Polynski, K. O. Kvashnina, P. Glatzel and V. P. Ananikov*

In the present study state-of-the-art experimental techniques involving ultra high resolution SEM/STEM microscopy (1 Å resolution), high brilliance X-ray absorption spectroscopy and theoretical calculations on truly nanoscale systems were utilized to reveal the role of carbon centers in the formation and nature of Pd/C catalytic materials.



Editorial staff

Interim executive editor

May Copsey

Deputy editor

Jeanne Andres

Editorial production manager

Philippa Ross

Development editors

Alessia Millemaggi
Cesar Palmero

Publishing editors

Matthew Bown, Sage Bowser, Hugh Cowley,
Ruth Dilleen, Cally Haynes, Alan Holder,
Samantha Ivell, James Moore, Liisa Niitsoo,
Victoria Richards, Susan Weatherby, Rachel Wood

Publishing assistants

Natalie Ford, Bethany Johnson, Rebecca Wojturska

Publisher

Jamie Humphrey

For queries about submitted articles please contact
Philippa Ross, Editorial production manager, in the
first instance. E-mail chemicalscience@rsc.org

For pre-submission queries please contact
May Copsey, Interim executive editor.
E-mail chemicalscience-rsc@rsc.org

Chemical Science (electronic: ISSN 2041-6539)
is published monthly 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 RSC 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

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

www.rsc.org/chemicalscience

Editorial board

Editor-in-chief

Daniel G. Nocera, Harvard University

Associate editors

Alán Aspuru-Guzik, Harvard
University
Zhenan Bao, Stanford University
Christopher C. Cummins,
Massachusetts Institute of
Technology
Kazunari Domen, University of Tokyo

Vy Dong, University of California,
Irvine
Matthew Gaunt, University of
Cambridge
Hubert Girault, Federal Polytechnic
School of Lausanne
Christopher A. Hunter, University of
Cambridge
David A. Leigh, University of
Manchester
Kopin Liu, Academia Sinica

James K. McCusker, Michigan State
University
Wonwoo Nam, Ewha Womans
University
Carsten Schultz, European Molecular
Biology Laboratory
F. Dean Toste, University of California,
Berkeley
Haw Yang, Princeton University
Jihong Yu, Jilin University

Advisory board

Takuzo Aida, University of Tokyo
Markus Antonietti, Max Planck
Institute of Colloids and Interfaces
Polly Arnold, University of Edinburgh
Xinhe Bao, Dalian Institute of
Chemical Physics
Guy Bertrand, University of California,
Los Angeles
Jeffrey Bode, Swiss Federal Institute of
Technology Zurich
Christopher Chang, University of
California, Berkeley
Chi-Ming Che, University of Hong
Kong
Jason Chin, Medical Research Council
Laboratory of Molecular Biology
Daniel Chiu, University of Washington
Graham Cooks, Purdue University
Eugenio Coronado, University of
Valencia
Lee Cronin, University of Glasgow
Gautam R. Desiraju, Indian Institute of
Science, Bangalore
James Durrant, Imperial College
London
Ben Feringa, University of Groningen
Cynthia Friend, Harvard University
Makoto Fujita, University of Tokyo
Philip Gale, University of Southampton
Song Gao, Peking University
Jinlong Gong, Tianjin University
Justin Gooding, University of New
South Wales
Michael Graetzel, Federal Polytechnic
School of Lausanne
Duncan Graham, University of
Strathclyde
Boxing Han, Chinese Academy of
Sciences

Jeremy Harvey, University of Bristol
Christy Haynes, University of
Minnesota
Johan Hofkens, Catholic University
of Leuven
Linda Hsieh-Wilson, California
Institute of Technology
Eric Jacobsen, Harvard University
Takashi Kato, University of Tokyo
Seong Keun Kim, Seoul National
University
Jerome Lacour, University of Geneva
James Leighton, Columbia University
Steve Ley, University of Cambridge
Chao-Jun Li, McGill University
Wenbin Lin, University of North
Carolina
Watson Loh, Instituto de Quimica
Julie Macpherson, University of
Warwick
Stephen Mann, University of Bristol
Bert Meijer, Eindhoven University of
Technology
Nils Metzler-Nolte, Ruhr University
Bochum
Scott Miller, Yale University
Daniel Minciola, Indiana University
Mohammad Movassaghi,
Massachusetts Institute of
Technology
Jonathan Nitschke, University of
Cambridge
Kyoko Nozaki, University of Tokyo
Takashi Ooi, Nagoya University
Rachel O'Reilly, University of Warwick
Michel Orrit, Leiden University
Oleg Ozerov, Texas A&M University
Hongkun Park, Harvard University

Rasmita Raval, University of Liverpool
Paul Reider, Princeton University
Stuart Rowan, Case Western Reserve
University
Richmond Sarpong, University of
California, Berkeley
Gregory Scholes, University of
Toronto
Oliver Seitz, Humboldt University of
Berlin
Kay Severin, Federal Polytechnic
School of Lausanne
Mikiko Sodeoka, RIKEN
Brian Stoltz, California Institute of
Technology
Weihong Tan, University of Florida
He Tian, East China University of
Science and Technology
Zhong-Qun Tian, Xiamen University
Andrei Tokmakoff, University of
Chicago
Jan Van Hest, Radboud University
Tom Welton, Imperial College London
Christina White, University of Illinois
Martin Wolf, Fritz Haber Institute of
the Max Planck Society
Omar Yaghi, University of California,
Los Angeles
Vivian Yam, University of Hong Kong
Yang Yang, University of California,
Los Angeles
Shu-Hong Yu, University of Science
and Technology of China
Qi-Lin Zhou, Nankai University

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:
<http://www.rsc.org/chemicalscience>.

Authors may reproduce/republish portions of their
published contribution without seeking permission
from the RSC, 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 2015.
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 Royal Society of Chemistry takes reasonable care in
the preparation of this publication but does not accept
liability for the consequences of any errors or omissions.

© The paper used in this publication meets the
requirements of ANSI/NISO Z39.48–1992
(Permanence of Paper).
Registered Charity No. 207890.

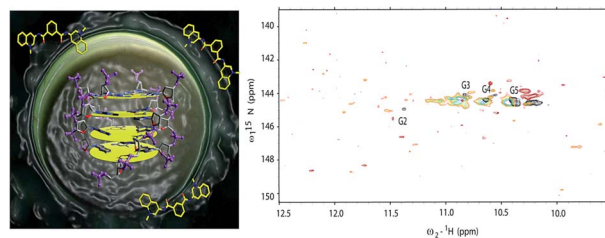


3314

G-quadruplex DNA and ligand interaction in living cells using NMR spectroscopy

Gilmar F. Salgado,* Christian Cazenave, Abdelaziz Kerkour and Jean-Louis Mergny

Using in-cell NMR spectroscopy to probe ligand binding to a G-quadruplex nucleic acid.

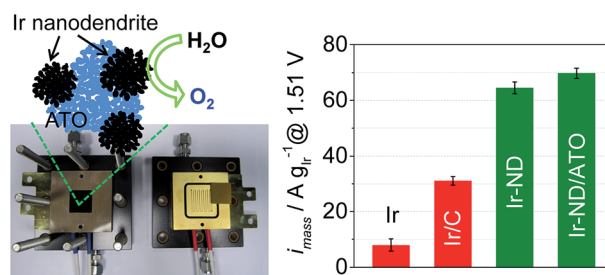


3321

Oxide-supported Ir nanodendrites with high activity and durability for the oxygen evolution reaction in acid PEM water electrolyzers

Hyung-Suk Oh, Hong Nhan Nong, Tobias Reier, Manuel Gliech and Peter Strasser*

Ir nanodendrites (Ir-ND) supported on antimony doped tin oxide (ATO) show enhanced catalytic activity and stability for oxygen evolution reaction (OER) in polymer electrolyte membrane (PEM) water electrolyzers.

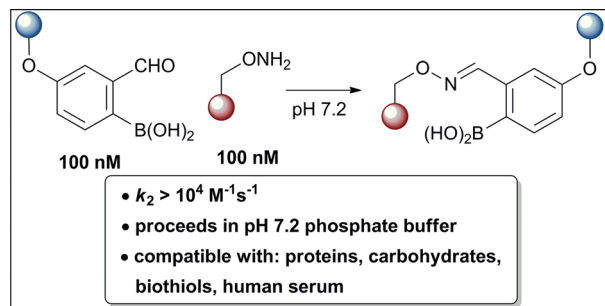


3329

Boronic acids facilitate rapid oxime condensations at neutral pH

Pascal Schmidt, Cedric Stress and Dennis Gillingham*

We report here the discovery and development of boron-assisted oxime formation as a powerful connective reaction for chemical biology.

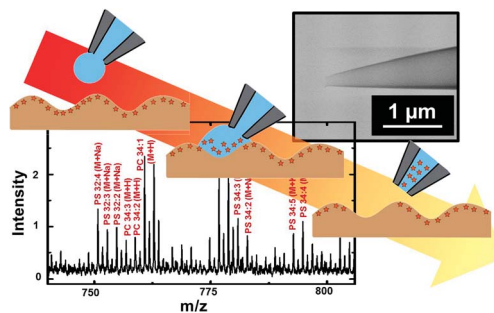


3334

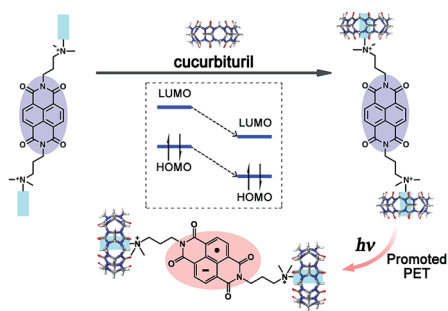
Nanopipettes: probes for local sample analysis

Anumita Saha-Shah, Anna E. Weber, Jonathan A. Karty, Steven J. Ray, Gary M. Hieftje and Lane A. Baker*

Nanopipettes are demonstrated as probes for local mass spectrometric analysis with potential for small-scale extraction of analytes from single cells, tissue and organisms.



3342

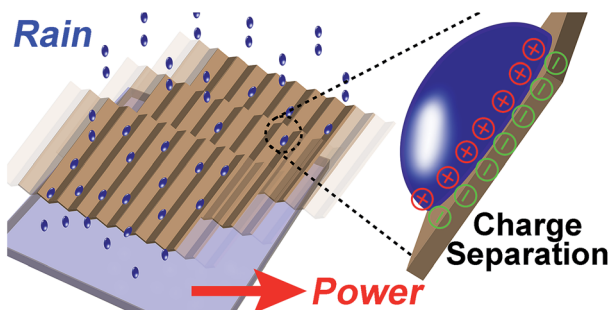


A supramolecular strategy for tuning the energy level of naphthalenediimide: Promoted formation of radical anions with extraordinary stability

Qiao Song, Fei Li, Zhiqiang Wang and Xi Zhang*

We report a supramolecular strategy to promote the formation of naphthalenediimide radical anions with extraordinary stability through tuning the energy level of naphthalenediimide.

3347



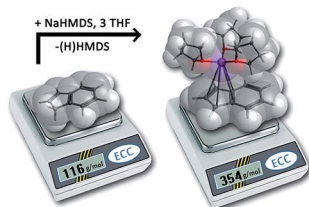
Using the gravitational energy of water to generate power by separation of charge at interfaces

Yajuan Sun, Xu Huang and Siowling Soh*

When water droplets (e.g., from rain) flow down a solid surface due to gravity, they can generate power.

3354

Molecular Weight Determination	Internal Calibration Curve (ICC)	External Calibration Curve (ECC)
Accurate MWs	✓	✓
High Temp-range	✓	✓
Reusable	✗	✓
One Internal Reference is sufficient	✗	✓
Easy Adjustment on Geometry	✗	✓
Normalized Diffusion Coefficients	✗	✓

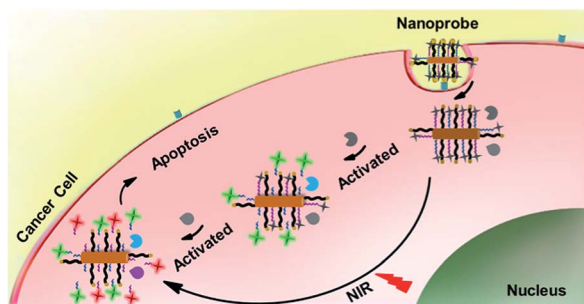


Accurate molecular weight determination of small molecules via DOSY-NMR by using external calibration curves with normalized diffusion coefficients

Roman Neufeld and Dietmar Stalke*

We describe a novel development of MW-determination by using an external calibration curve approach with normalized diffusion coefficients.

3365



In situ activation and monitoring of the evolution of the intracellular caspase family

Lei Zhang, Jianping Lei,* Jintong Liu, Fengjiao Ma and Huangxian Ju*

An integrated nano-platform is designed to achieve *in situ* activation, monitoring and signal feedback of the caspase family evolution from upstream to downstream.

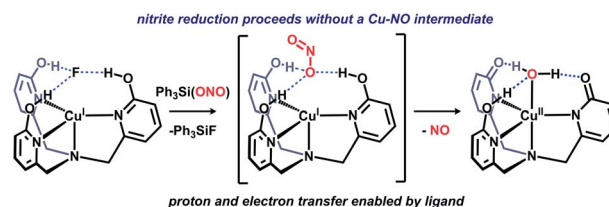


3373

Nitrite reduction by copper through ligand-mediated proton and electron transfer

Cameron M. Moore and Nathaniel K. Szymczak*

A copper complex featuring a proton-responsive tripodal ligand reduces nitrite *via* a proton/electron transfer process, which parallels copper nitrite reductase.

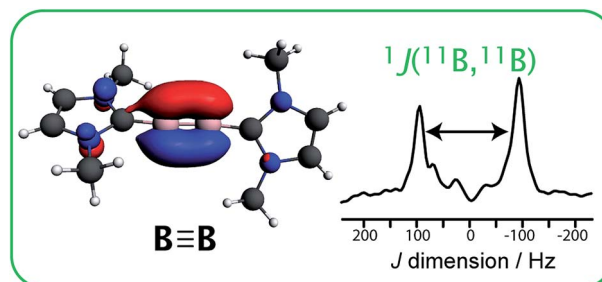


3378

Spying on the boron–boron triple bond using spin–spin coupling measured from ^{11}B solid-state NMR spectroscopy

Frédéric A. Perras, William C. Ewing, Theresa Dellermann, Julian Böhnke, Stefan Ullrich, Thomas Schäfer, Holger Braunschweig* and David L. Bryce*

Boron–boron J coupling constants provide new insight into the nature of the boron–boron triple bond.

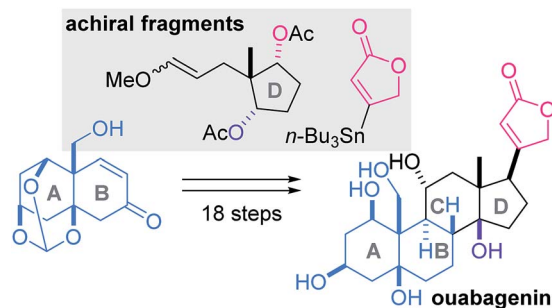


3383

A convergent total synthesis of ouabagenin

Ken Mukai, Satoshi Kasuya, Yuki Nakagawa, Daisuke Urabe and Masayuki Inoue*

A convergent total synthesis of ouabagenin, an aglycon of cardenolide glycoside ouabain, was achieved by assembly of the AB-ring, D-ring and butenolide moieties.

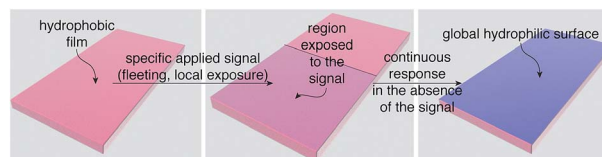


3388

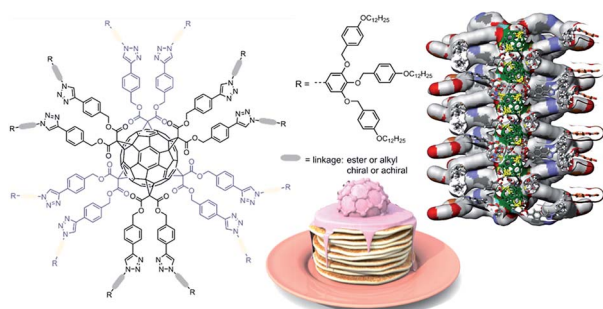
Polymeric materials that convert local fleeting signals into global macroscopic responses

Hyungwoo Kim, Matthew S. Baker and Scott T. Phillips*

Polymers that support self-propagating reactions are used to create materials that change global wetting properties in response to specific fleeting, local stimuli.



3393

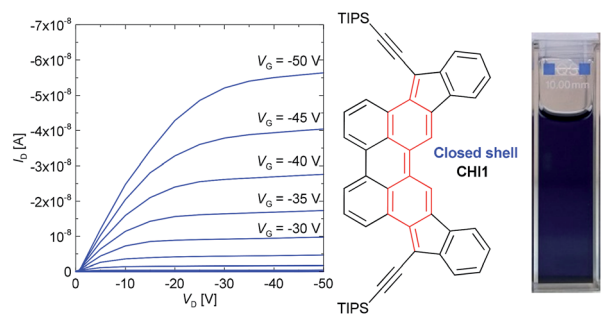


Self-organisation of dodeca-dendronized fullerene into supramolecular discs and helical columns containing a nanowire-like core

Sebastiano Guerra, Julien Iehl, Michel Holler, Mihai Peterca, Daniela A. Wilson, Benjamin E. Partridge, Shaodong Zhang, Robert Deschenaux,* Jean-François Nierengarten* and Virgil Percec*

C_{60} dendronized with 12 chiral or achiral self-assembling dendrons form discs with C_{60} at their centre that self-organise into helical columns with a nanowire-like core.

3402

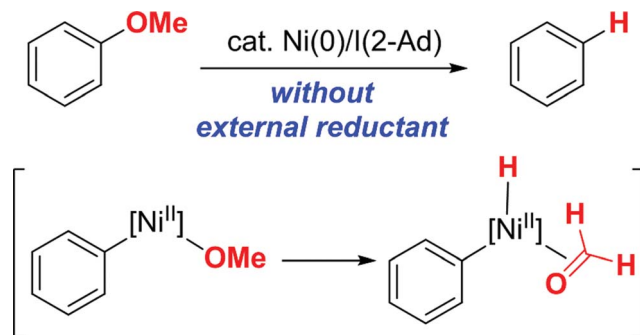


Diindeno[1,2-b:2',1'-n]perylene: a closed shell related Chichibabin's hydrocarbon, the synthesis, molecular packing, electronic and charge transport properties

Kamal Sbagoud, Masashi Mamada,* Jérôme Marrot, Shizuo Tokito, Abderrahim Yassar* and Michel Frigoli*

A fixed Chichibabin's hydrocarbon CHI1 shows a closed shell configuration with a broad absorption from 400 up to 900 nm.

3410

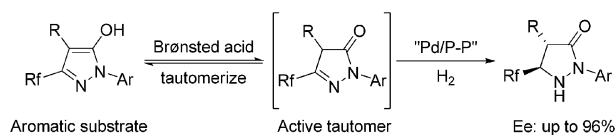


Nickel-catalyzed reductive cleavage of aryl alkyl ethers to arenes in absence of external reductant

Mamoru Tobisu,* Toshifumi Morioka, Akimichi Ohtsuki and Naoto Chatani*

A nickel catalyst for reductive cleavage of aryl ethers in the absence of an external reductant is developed. The alkoxy group of the substrate serves as an internal reductant.

3415



Pd-catalyzed asymmetric hydrogenation of fluorinated aromatic pyrazol-5-ols via capture of active tautomers

Zhang-Pei Chen, Mu-Wang Chen, Lei Shi, Chang-Bin Yu and Yong-Gui Zhou

Here we explore a novel strategy for asymmetric hydrogenation of aromatic pyrazol-5-ols via capture of the active tautomers.

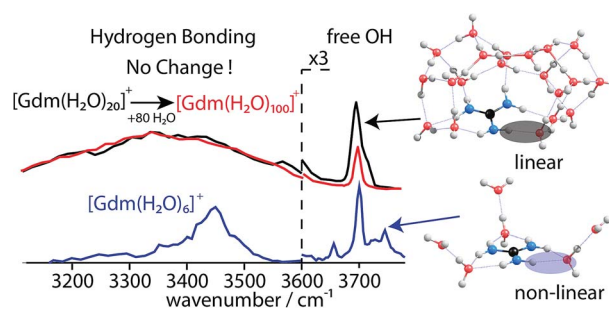


3420

Hydration of guanidinium depends on its local environment

Sven Heiles, Richard J. Cooper, Matthew J. DiTucci and Evan R. Williams*

Infrared spectroscopy of guanidinium confined in gaseous nanodrops shows hydration depends on local environment and lends new insights into its effectiveness as a protein denaturant.

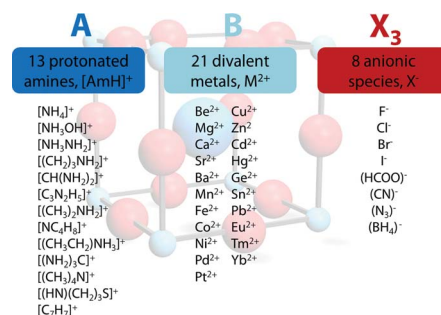


3430

An extended Tolerance Factor approach for organic–inorganic perovskites

Gregor Kieslich,* Shijing Sun and Anthony K. Cheetham*

Tolerance Factors of possible hybrid perovskites are calculated for over 2500 amine-metal-anion permutations of the periodic table.

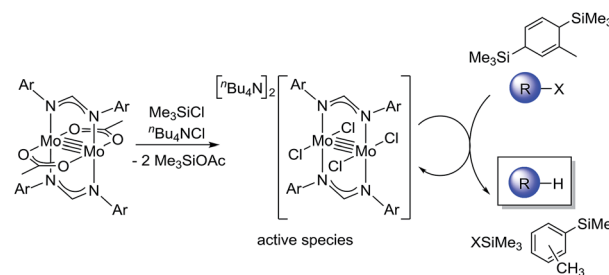


3434

Mixed-ligand complexes of paddlewheel dinuclear molybdenum as hydrodehalogenation catalysts for polyhaloalkanes

Hayato Tsurugi,* Akio Hayakawa, Shun Kando, Yoshitaka Sugino and Kazushi Mashima*

A mixed-ligated dimolybdenum complex Mo₂(OAc)₂[CH(NAr)₂]₂ in combination with 1-methyl-3,6-bis(trimethylsilyl)-1,4-cyclohexadiene and ⁿBu₄NCl exhibited high catalytic activity for hydrodehalogenation reactions.

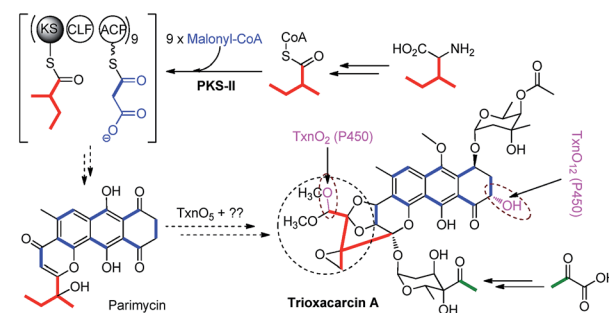


3440

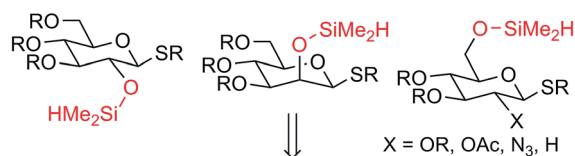
Biosynthesis of trioxacarcin revealing a different starter unit and complex tailoring steps for type II polyketide synthase

Mei Zhang, Xian-Feng Hou, Li-Hua Qi, Yue Yin, Qing Li, Hai-Xue Pan, Xin-Ya Chen and Gong-Li Tang*

Different starter unit and complex tailoring steps for type II polyketide synthase in trioxacarcin biosynthesis.



3448

**Accessible Products**

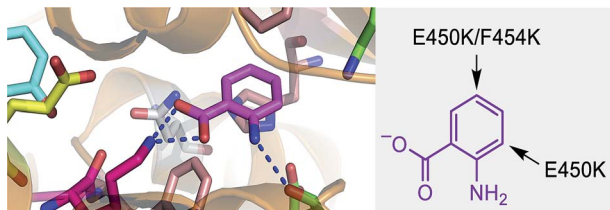
Glycoside Stereochemistry	β-manno	Glycoside Functionality	2-benzyloxy
	α-gluco		2-acyloxy
	β-gluco		2-deoxy
			2-azido

Sugar silanes: versatile reagents for stereocontrolled glycosylation via intramolecular aglycone delivery

Jordan T. Walk, Zachary A. Buchan
and John Montgomery*

A new method for the intramolecular glycosylation of alcohols is described.

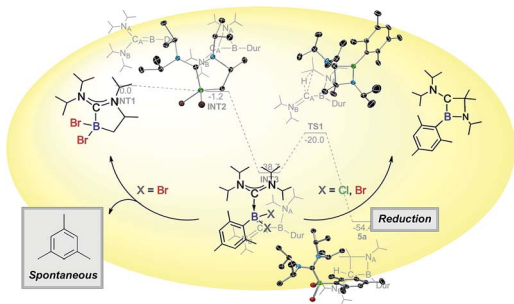
3454

**Extending the biocatalytic scope of regiocomplementary flavin-dependent halogenase enzymes**

Sarah A. Shepherd, Chinnan Karthikeyan,
Jonathan Latham, Anna-Winona Struck, Mark
L. Thompson, Binuraj R. K. Menon, Matthew Q. Styles,
Colin Levy, David Leys and Jason Micklefield*

Targeted mutagenesis increases the activity and alters the regioselectivity of flavin-dependent halogenases.

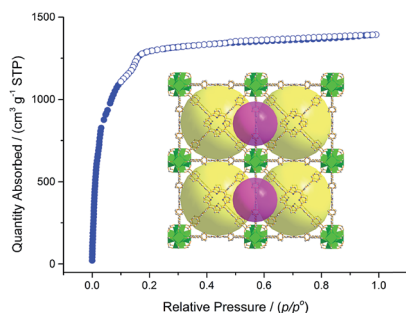
3461

**Generation of 1,2-azaboretidines via reduction of ADC borane adducts**

H. Braunschweig,* A. Gackstatter, T. Kupfer, T. Scheller,
F. Hupp, A. Damme, N. Arnold and W. C. Ewing

ADC borane adducts $\text{RBX}_2 \cdot \text{ADC}$ ($\text{R} = \text{Mes}, \text{Dur}$; $\text{X} = \text{Cl}, \text{Br}$; $\text{ADC} = \text{:C}(\text{NiPr}_2)_2$) have been prepared and reduced by KC_8 to afford air stable 1,2-azaboretidines with high selectivity.

3466

**Stable porphyrin Zr and Hf metal-organic frameworks featuring 2.5 nm cages: high surface areas, SCSC transformations and catalyses**

Jun Zheng, Mingyan Wu,* Feilong Jiang, Weiping Su*
and Maochun Hong

Two isostructural porphyrin Zr and Hf metal-organic frameworks (FJI-H6 and FJI-H7) are rationally synthesized, and are constructed from 2.5 nm cubic cages.

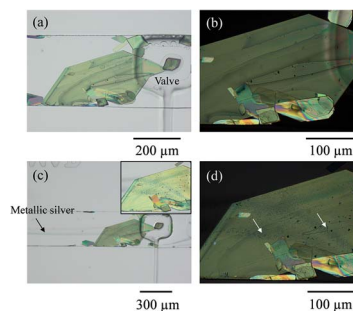


3471

Bottom-up on-crystal in-chip formation of a conducting salt and a view of its restructuring: from organic insulator to conducting "switch" through microfluidic manipulation

Josep Puigmartí-Luis,^{*} Markos Paradinas, Elena Bailo, Romen Rodríguez-Trujillo, Raphael Pfattner, Carmen Ocal^{*} and David B. Amabilino^{*}

The chemical modification of an immobilized single crystal in a fluid cell is reported, whereby a material with switching functions is generated with reagent in the stream.

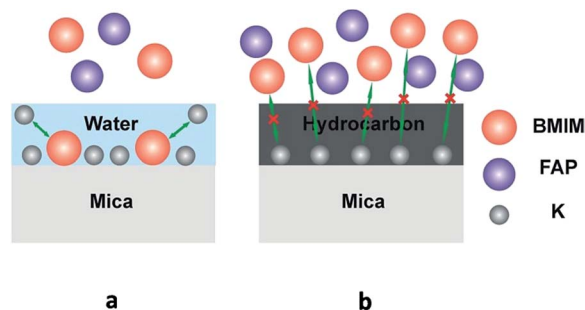


3478

What causes extended layering of ionic liquids on the mica surface?

Xiao Gong, Andrew Kozbial and Lei Li^{*}

The adsorbed water on the mica surface is the key to the extended layering of ILs.

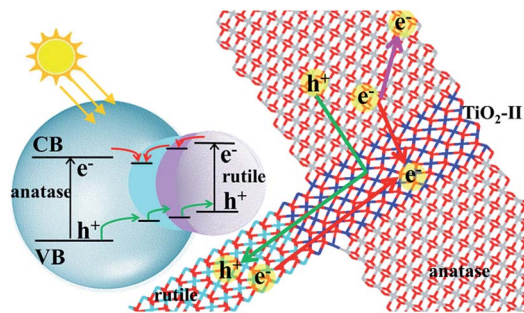


3483

Three-phase junction for modulating electron–hole migration in anatase–rutile photocatalysts

Wei-Na Zhao, Sheng-Cai Zhu, Ye-Fei Li and Zhi-Pan Liu^{*}

Theory resolves the anatase–rutile phase junction structure and characterizes its role in photocatalysis as a *single-way* valve modulating electron–hole separation.

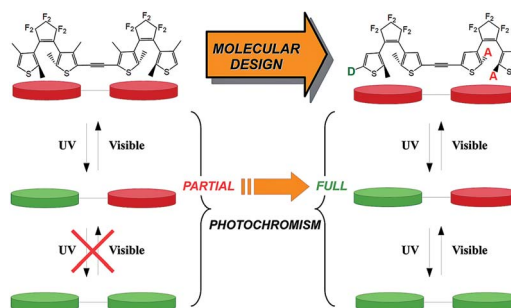


3495

Designing efficient photochromic dithienylethene dyads

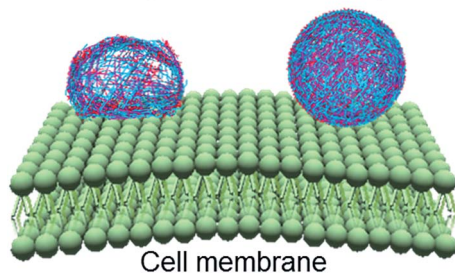
Arnaud Fihey and Denis Jacquemin^{*}

The impact of chemical substitution on the optical properties of *ca.* 30 dithienylethene (DTE) dyads is investigated with first-principles approaches, with the aim to provide useful guidelines for obtaining more efficient DTE multimers.



3505

Soft HA capsules Stiff HA capsules

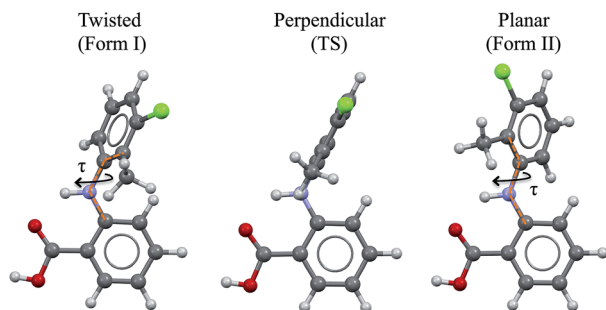


The role of capsule stiffness on cellular processing

Huanli Sun, Edgar H. H. Wong, Yan Yan, Jiwei Cui, Qiong Dai, Junling Guo, Greg G. Qiao* and Frank Caruso*

A systematic and quantitative study on the role of capsule stiffness in cellular processing was performed using hyaluronic acid capsules with tunable stiffness constructed via continuous assembly of polymers.

3515

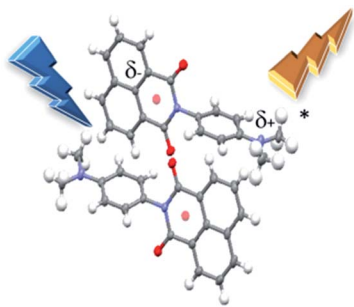


Can the study of self-assembly in solution lead to a good model for the nucleation pathway? The case of tolfenamic acid.

W. Du, A. J. Cruz-Cabeza, S. Woutersen, R. J. Davey* and Q. Yin

To further our understanding of the role of solution chemistry in directing nucleation processes new experimental and computational data are presented on the solution and crystallisation chemistry of tolfenamic acid (TA), a benchmark polymorphic compound.

3525

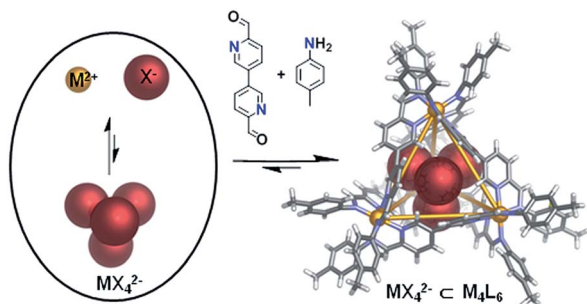


Polymorph crystal packing effects on charge transfer emission in the solid state

Xiaoyan He, Andrew C. Benniston,* Hanna Saarenpää, Helge Lemmetyinen, Nikolia V. Tkachenko* and Ulrich Baisch

Condensation of 1,8-naphthalic anhydride with *N,N*-(dimethylamino)aniline produced the donor-acceptor compound **DMIM**, which crystallised from a chloroform–diethyl ether mixture to afford two different coloured crystal polymorphs.

3533



Mutual stabilisation between $M^{II}_4L_6$ tetrahedra and $M^{II}X_4^{2-}$ metallate guests

Imogen A. Riddell, Tanya K. Ronson and Jonathan R. Nitschke*

A series of $[M^{II}X_4]^{2-} \subset M^{II}_4L_6$ host–guest complexes are formed through the mutual stabilisation of the host and guest complexes; neither the host nor guest is stable in the absence of the other.

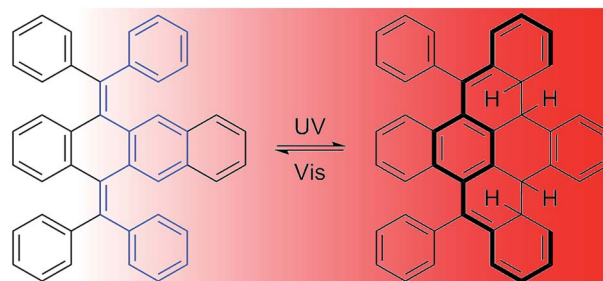


3538

Aggregation-induced emission and aggregation-promoted photochromism of bis(diphenylmethylene)dihydroacenes

Zikai He, Liang Shan, Ju Mei, Hong Wang, Jacky W. Y. Lam, Herman H. Y. Sung, Ian D. Williams, Xiao Gu, Qian Miao* and Ben Zhong Tang*

Solid-state photochromism was found in bis(diphenylmethylene)dihydro-tetracene, caused by photocyclization of the embedded *cis*-stilbene motifs.

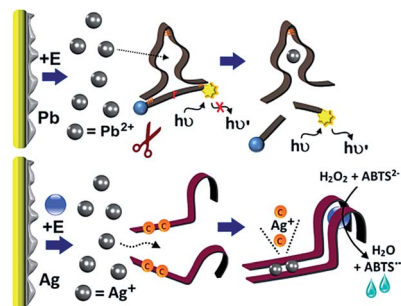


3544

Addressing, amplifying and switching DNAzyme functions by electrochemically-triggered release of metal ions

Lina Freage, Alexander Trifonov, Ran Tel-Vered, Eyal Golub, Fuan Wang, John S. McCaskill and Itamar Willner*

The addressable potential-controlled release of metal ions into electrolyte solutions containing mixtures of nucleic acids leads to the metal ion-guided generation of different DNAzymes and to the activation of DNA cascades.

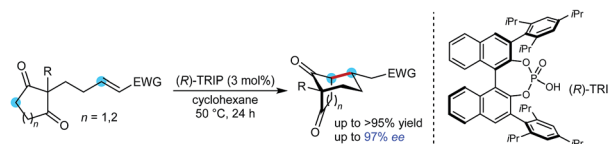


3550

Enantioselective synthesis of bicyclo[3.n.1]alkanes by chiral phosphoric acid-catalyzed desymmetrizing Michael cyclizations

Alan R. Burns, Amaël G. E. Madec, Darryl W. Low, Iain D. Roy and Hon Wai Lam*

2,2-Disubstituted cyclic 1,3-diketones containing a tethered electron-deficient alkene undergo chiral phosphoric acid-catalyzed desymmetrizing Michael cyclizations to give bridged bicyclic products in high enantioselectivities.

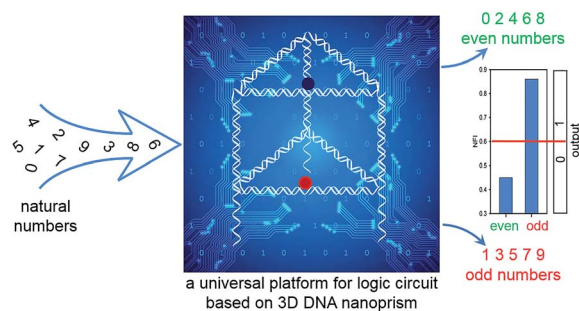


3556

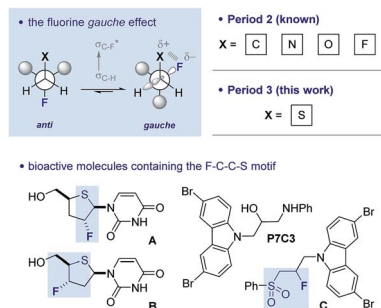
A universal platform for building molecular logic circuits based on a reconfigurable three-dimensional DNA nanostructure

Kaiyu He, Yong Li, Binbin Xiang, Peng Zhao, Yufang Hu, Yan Huang, Wang Li, Zhou Nie* and Shouzhao Yao

Integrating multiple components of a logic device into a 3D DNA nanoprism provides a universal platform for constructing diverse logic gates.



3565

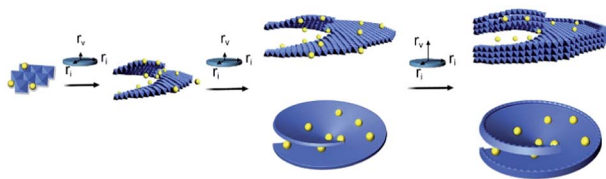


Can acyclic conformational control be achieved via a sulfur–fluorine *gauche* effect?

C. Thiehoff, M. C. Holland, C. Daniliuc, K. N. Houk* and R. Gilmour*

Herein detailed conformational analyses of β -fluorosulfides, -sulfoxides and -sulfones are disclosed, thus extending the scope of the fluorine *gauche* effect to the 3rd Period (X = SR, SOR, SO₂R; $\phi_{\text{FCCS}} \approx 60^\circ$).

3572

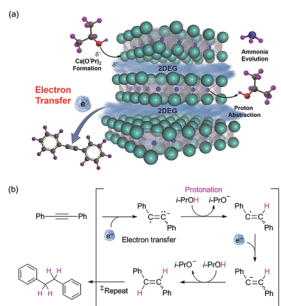


Edge overgrowth of spiral bimetallic hydroxides ultrathin-nanosheets for water oxidation

Bing Ni and Xun Wang*

We have synthesized spiral ultrathin-nanosheets with overgrown edges of NiFe, CoNi and CoFe bimetallic hydroxides which show excellent performance for the OER.

3577

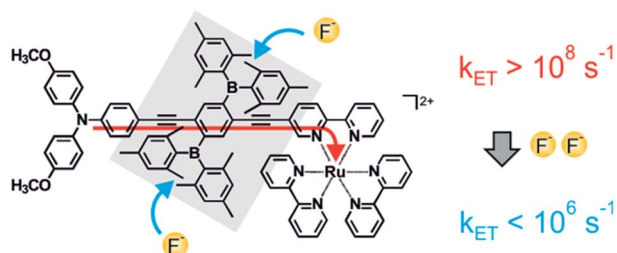


Two dimensional inorganic electride-promoted electron transfer efficiency in transfer hydrogenation of alkynes and alkenes

Ye Ji Kim, Sun Min Kim, Eun Jin Cho, Hideo Hosono, Jung Woon Yang* and Sung Wng Kim*

A simple and highly efficient transfer hydrogenation of alkynes and alkenes by using a two-dimensional electride, dicalcium nitride ($[\text{Ca}_2\text{N}]^+ \cdot e^-$), as an electron transfer agent is disclosed.

3582



Fluoride binding to an organoboron wire controls photoinduced electron transfer

Jing Chen and Oliver S. Wenger*

The efficiency of organoboron wires as mediators of long-range electron transfer can be controlled by anion binding.

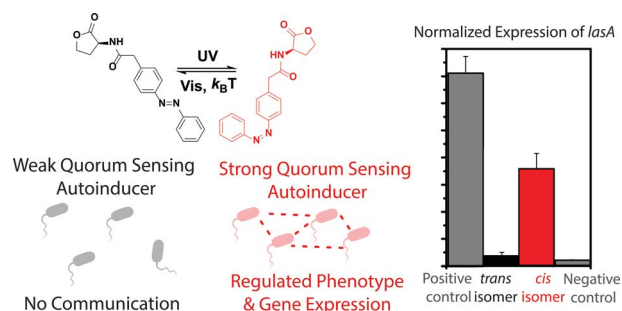


3593

Controlling the activity of quorum sensing autoinducers with light

J. P. Van der Berg, W. A. Velema, W. Szymanski, A. J. M. Driessen* and B. L. Feringa*

Bacteria use Quorum Sensing (QS) to organize into communities and synchronize gene expression. Here we report on a method to externally interfere with QS system using light.

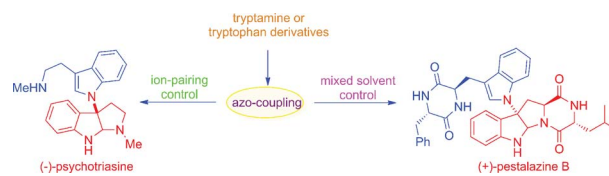


3599

Enantioselective and diastereoselective azo-coupling/iminium-cyclizations: a unified strategy for the total syntheses of (–)-psychotriasine and (+)-pestalazine B

Qi Li, Tingting Xia, Licheng Yao, Haiteng Deng* and Xuebin Liao*

We report a unified strategy for the total syntheses of (–)-psychotriasine and (+)-pestalazine B based on the advanced intermediates of 3 α -amino-hexahydropyrrolo-[2,3-*b*]indole.

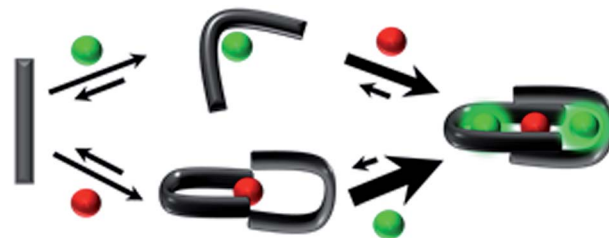


3606

A prochelator peptide designed to use heterometallic cooperativity to enhance metal ion affinity

Bruno Alies, Jacob D. Wiener and Katherine J. Franz*

A peptide has been designed so that its chelating affinity for one type of metal ion regulates its affinity for a second, different type of metal ion.

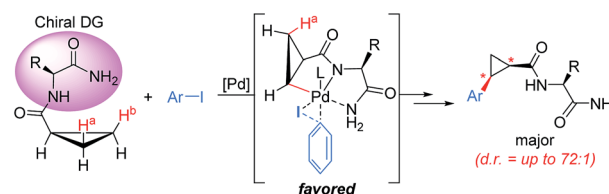


3611

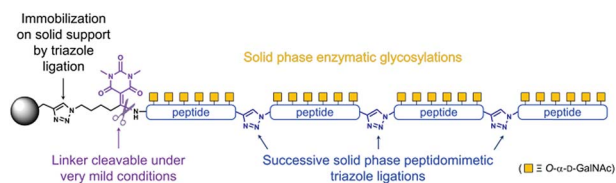
Asymmetric C–H functionalization of cyclopropanes using an isoleucine-NH₂ bidentate directing group

Jinhee Kim, Mikyung Sim, Namhoon Kim and Sungwoo Hong*

The use of an Ile-NH₂ auxiliary can provide excellent levels of asymmetric induction in the Pd(II)-catalyzed C(sp³)-H functionalization of cyclopropanes.



3617

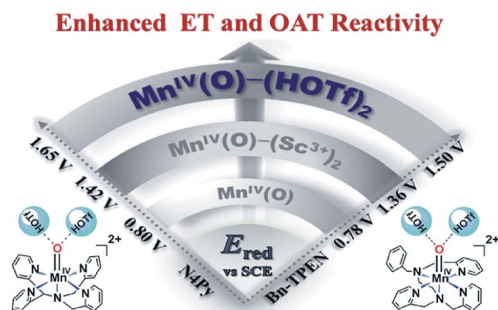


Combining triazole ligation and enzymatic glycosylation on solid phase simplifies the synthesis of very long glycoprotein analogues

Mathieu Galibert, Véronique Piller, Friedrich Piller, Vincent Aucagne* and Agnès F. Delmas

Solid phase chemical ligation followed by enzymatic glycosylation exploits the advantages of a solid support to minimize the purification steps, constituting a promising approach for the synthesis of complex glycoproteins.

3624



Tuning the reactivity of mononuclear nonheme manganese(IV)-oxo complexes by triflic acid

Junying Chen, Heejung Yoon, Yong-Min Lee, Mi Sook Seo, Ritimukta Sarangi, Shunichi Fukuzumi* and Wonwoo Nam*

Binding of two HOFt molecules to $Mn^{IV}(O)$ species resulted in contrasting effects on the reactivities in oxygen atom transfer and H-atom transfer reactions.

CORRECTION

3633

Correction: Cobalt co-catalysis for cross-electrophile coupling: diarylmethanes from benzyl mesylates and aryl halides

Laura K. G. Ackerman, Lukiana L. Anka-Lufford, Marina Naodovic and Daniel J. Weix*

RETRACTION

3634

Retraction: Homonuclear bond activation using a stable N,N' -diamidocarbene

Kelly M. Wiggins, Jonathan P. Moerdyk and Christopher W. Bielawski*

