



Cover
Juxtaposition of triple-decker cations and triplanes (pp. 2369–2375).



Chemical biology articles published in this journal also appear in the *Chemical Biology Virtual Journal*:
www.rsc.org/chembiol

Take a look!
Chemical Science
inside this issue

contents

C81

Chemical Science

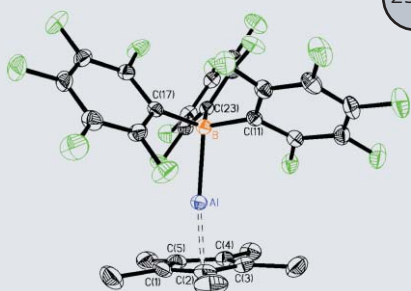
November 2004/Volume 1/Issue 11

www.rsc.org/chemicalscience

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant scientific advances.

FEATURE ARTICLE

2369



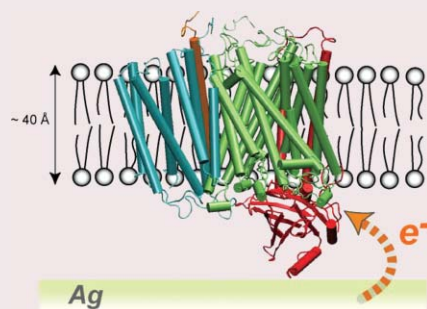
From group 13–group 13 donor–acceptor bonds to triple-decker cations

Alan H. Cowley

Borane-diyls (RB) and heavier congeneric univalent group 13 molecules possess a lone pair of electrons and are therefore able to form group 13–group 13 donor–acceptor bonds when treated with appropriate Lewis acids.

COMMUNICATIONS

2376



Active site structure and redox processes of cytochrome *c* oxidase immobilised in a novel biomimetic lipid membrane on an electrode

Marcel G. Friedrich, Frank Gieß, Renate Naumann, Wolfgang Knoll, Kenichi Ataka, Joachim Heberle, Jana Hrabakova, Daniel H. Murgida and Peter Hildebrandt*

Surface enhanced resonance Raman spectroscopy of cytochrome *c* oxidase, embedded in a lipid bilayer and immobilised on an electrode, reveals preservation of the active site structures and electron exchange with the electrode.

Chemical Communications

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

EDITORIAL STAFF

Managing editor

Sarah Thomas

Deputy editor

Sula Armstrong

Assistant editors

Meriel Dyche

Alison Stoddart

Lorna Jack

Katherine Vickers

Publishing assistants

Jayne Drake

Lois Kershaw

Jayne Gough

Crystallographic data editor

Kirsty Anderson

Team leader, serials production

Helen Saxton

Technical editors

Sandra Jones

Elinor Richards

Kathryn Lees

Michael Smith

Caroline Moore

Ken Wilkinson

Production administration coordinator

Sonya Spring

Editorial secretaries (production)

Sarah James

Julie Thompson

Publisher, journals and reviews

Adrian Kybett

Chemical Communications (print:ISSN 1359-7345;electronic:ISSN1364-548X) is published 24 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road,Cambridge, UK CB4 0WF. All orders accompanied by payment should be sent directly to Extenza-Turpin Distribution Services Ltd,Pegasus Drive, Biggleswade, Beds, UK SG18 8QB. 2004 Annual(print + electronic) subscription price: £1045; US\$1725. 2004 Annual (electronic) subscription price: £940; US\$1552. 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 RSC journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip. Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank. Periodicals postage paid at Rahway, NJ, USA and at additional mailing offices. Airfreight and mailing in the USA by Mercury Airfreight International Ltd., 365 Blair Road, Avenel, NJ 07001, USA. US Postmaster: send address changes to *Chemical Communications*, c/o Mercury Airfreight International Ltd., 365 Blair Road, Avenel, NJ 07001. All despatches outside the UK by Consolidated Airfreight.

PRINTED IN THE UK.

Advertisement sales: Tel +44 (0)1223 432153; Fax +44 (0)1223 426017; E-mail advertising@rsc.org

© The Royal Society of Chemistry, 2004. 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 Regulations 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 Publisher 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. Inclusion of an item in this publication does not imply endorsement by The Royal Society of Chemistry of the content of the original documents to which that item refers

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

EDITORIAL BOARD

Chairman

Roeland J. M. Nolte, Nijmegen, The Netherlands

E-mail: nolte@sci.kun.nl

Jerry L. Atwood, Columbia, MO, USA

E-mail: rsc.chemcomm@missouri.edu

Shankar Balasubramanian, Cambridge, UK

E-mail: sb10031@cam.ac.uk

Hans-Ulrich Blaser, Solvias AG, Switzerland

E-mail: hans-ulrich.blaser@SOLVIAS.com

Makoto Fujita, Tokyo, Japan

E-mail: mfujita@appchem.t.u-tokyo.ac.jp

Alois Fürstner, Mülheim, Germany

E-mail: fuerstner@mpi-muelheim.mpg.de

David Haddleton, Warwick, UK

E-mail: D.M.Haddleton@warwick.ac.uk

SCIENTIFIC EDITORS

The Scientific Editors welcome enquiries from potential authors regarding the submission and scientific content of papers. For the submission of manuscripts please

see <http://www.rsc.org/authors>

Professor Dermot O'Hare

Inorganic Chemistry Laboratory

University of Oxford

Oxford, UK

E-mail: chemcomm@chem.ox.ac.uk

ASSOCIATE EDITORS

Manuscripts from the Americas should be submitted to the appropriate Associate Editor. Manuscripts from other regions should be submitted to the Cambridge Editorial Office. For information on how to submit your manuscript see <http://www.rsc.org/authors>

Manuscripts from the Americas

SUPRAMOLECULAR

Professor Jerry L. Atwood

123 Chemistry Building

University of Missouri

Columbia, MO, USA

E-mail: rsc.chemcomm@missouri.edu

CHEMICAL BIOLOGY

Professor Barbara Imperiali

Department of Chemistry

Massachusetts Institute of Technology

Cambridge, MA, USA

E-mail: chemcomm@mit.edu

EDITORIAL ADVISORY BOARD

Takuzo Aida, Tokyo, Japan

Frank Allen, CCDC, Cambridge, UK

Dario Braga, Bologna, Italy

Duncan W. Bruce, Exeter, UK

Jillian M. Buriak, Edmonton, Canada

David H. G. Crout, Warwick, UK

Marcetta Darensbourg, College Station, TX, USA

Gautam R. Desiraju, Hyderabad, India

Pierre H. Dixneuf, Rennes, France

Gregory C. Fu, Cambridge, MA, USA

Tohru Fukuyama, Tokyo, Japan

Lutz Gade, Heidelberg, Germany

George W. Gokel, St Louis, MO, USA

Karl J. Hale, London, UK

Andrew B. Holmes, Cambridge, UK

Donald Hilvert, Zurich, Switzerland

E-mail: hilvert@org.chem.ethz.ch

Mir Wais Hosseini, Strasbourg, France

E-mail: hosseini@chimie.u-strasbg.fr

Barbara Imperiali, Cambridge, MA, USA

E-mail: chemcomm@mit.edu

Dermot O'Hare, Oxford, UK

E-mail: chemcomm@chem.ox.ac.uk

Colin Raston, Perth, Australia

E-mail: claston@chem.uwa.edu.au

Clément Sanchez, Paris, France

E-mail: clems@cocr.jussieu.fr

Ferdinand Schüth, Mülheim, Germany

E-mail: schueth@mpi-muelheim.mpg.de

James D. White, Corvallis, OR, USA

E-mail: james.white@orst.edu

Professor Donald Hilvert

Laboratory of Organic Chemistry

ETH Zentrum, Zurich, Switzerland

E-mail: hilvert@org.chem.ethz.ch

Professor Mir Wais Hosseini

Lab de Chimie de Coordination Organique

Université Louis Pasteur, Strasbourg, France

E-mail: hosseini@chimie.u-strasbg.fr

Professor Alois Fürstner

Max-Planck-Institut für Kohlenforschung

Mülheim/Ruhr, Germany

E-mail: fuerstner@mpi-muelheim.mpg.de

ORGANIC

Professor James D. White

Department of Chemistry

Oregon State University

Corvallis, OR, USA

E-mail: james.white@orst.edu

Manuscripts from all other regions

Dr Sarah Thomas

Chemical Communications

Royal Society of Chemistry

Thomas Graham House

Science Park, Milton Road

Cambridge, UK, CB4 0WF

Tel (+44) (0) 1223 420066

Fax (+44) (0) 1223 420247

E-mail: chemcomm@rsc.org

Amir Hoveyda, Boston, MA, USA

Kazuyuki Kuroda, Tokyo, Japan

Jérôme Lacour, Geneva, Switzerland

E. W. 'Bert' Meijer, Eindhoven, The Netherlands

Albert I. Meyers, Fort Collins, CO, USA

Jason Micklefield, Manchester, UK

Achim Müller, Bielefeld, Germany

Maurizio Prato, Trieste, Italy

Richard J. Puddephatt, London, ON, Canada

Christopher A. Reed, Riverside, CA, USA

Jonathan Sessler, Austin, TX, USA

David C. Sherrington, Glasgow, UK

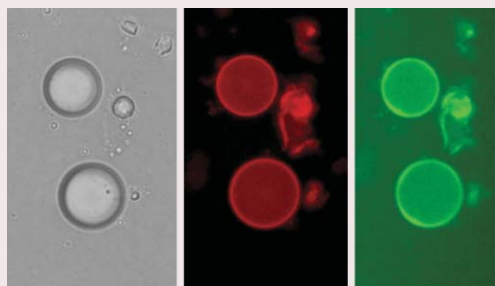
Jonathan W. Steed, Durham, UK

Herbert Waldmann, Dortmund, Germany

Henry N. C. Wong, Hong Kong, PR China

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 The Royal Society of Chemistry.

2378

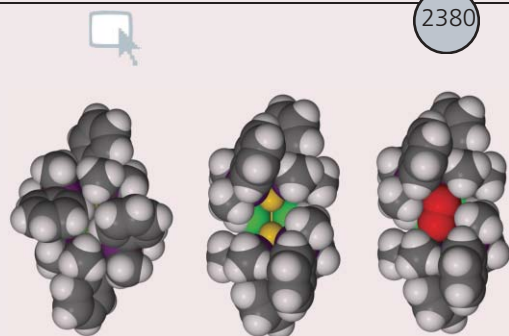


Preparation of aqueous gel beads coated by lipid bilayers

Andrew Campbell, Pietro Taylor, Olivier J. Cayre and Vesselin N. Paunov*

Novel giant liposome microcapsules have been fabricated based on aqueous gel cores encapsulated with a lipid bilayer. The method involves templating of lipid-stabilised water-in-oil emulsions after gelling the aqueous phase.

2380

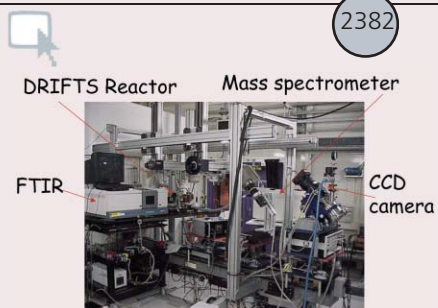


Metallaborane reaction chemistry. A facile and reversible dioxygen capture by a B-frame-supported bimetallic: structure of $[(\text{PMe}_2\text{Ph})_4(\text{O}_2)\text{Pt}_2\text{B}_{10}\text{H}_{10}]$

Jonathan Bould, Yvonne M. McInnes, Michael J. Carr and John D. Kennedy*

The $\{\text{Pt}_2\}$ unit of $[(\text{PMe}_2\text{Ph})_4\text{Pt}_2\text{B}_{10}\text{H}_{10}]$ **1** reversibly takes up atmospheric dioxygen to give the dioxygen-dimetalaborane complex $[(\text{PMe}_2\text{Ph})_4(\text{O}_2)\text{Pt}_2\text{B}_{10}\text{H}_{10}]$ **2**; the resulting $\{\text{Pt}_2\}-\{\text{O}_2\}$ binding mode is fluxional.

2382

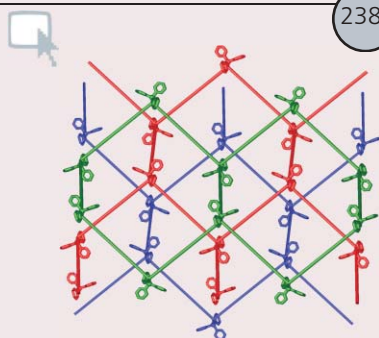


Synchronous, time resolved, diffuse reflectance FT-IR, energy dispersive EXAFS (EDE) and mass spectrometric investigation of the behaviour of Rh catalysts during NO reduction by CO

Mark A. Newton*, Bhrat Jyoti, Andrew J. Dent, Steven G. Fiddy and John Evans*

Synchronous, time resolved, infra-red, XAFS, and mass spectroscopies are simultaneously applied *in situ* to the investigation of the dynamic behaviour of Rh/Al₂O₃ catalysts during NO reduction by CO; NO conversion, and its kinetic character are closely correlated to the conversion of Rh(I) (predominantly Rh^I(CO)₂) to Rh(0).

2384

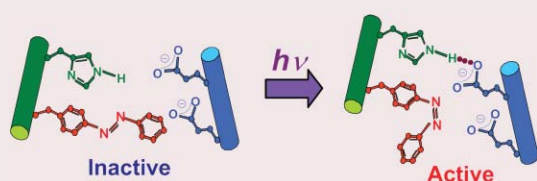


Non-interpenetrating honeycomb-like 2D [6,3] network built by a novel trigonal metalloligand

Kyoung-Tae Youm, Seong Huh, Young Jun Park, Sangwoo Park, Moon-Gun Choi and Moo-Jin Jun*

Novel silver trigonal metalloligands are interlinked through linear linkers to result in a large non-interpenetrating honeycomb-like 2D [6,3] network lattice.

2386

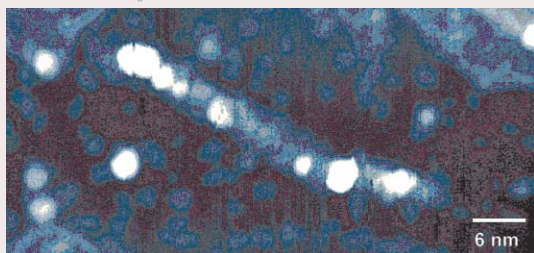


Photochemical regulation of the activity of an endonuclease BamHI using an azobenzene moiety incorporated site-selectively into the dimer interface

Koji Nakayama, Masayuki Endo and Tetsuro Majima*

An endonuclease BamHI possessing phenylazophenylalanine (azoAla) was designed and synthesized. When azoAla was incorporated site-selectively into the dimer interface at the 132 position, the *trans*-form of azoAla suppressed the activity. After photoirradiation for generation of the *cis*-isomer, the azoAla-BamHI recovered the activity whose level was purposely controlled by the photoirradiation time.

2388

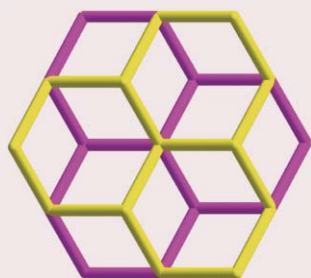


Synthesis of long Poly(dG)·Poly(dC) DNA using enzymatic reaction

Shin-ichi Tanaka, Masateru Taniguchi, Susumu Uchiyama, Kiichi Fukui and Tomoji Kawai*

Non-defect Poly(dG)·Poly(dC) of 500 bp (170 nm) has been synthesized by using enzymatic reactions and was characterized by its UV spectrum, showing that conjugated π -electrons between base pairs are spread over the DNA molecule suggesting the absence of structural defects.

2390

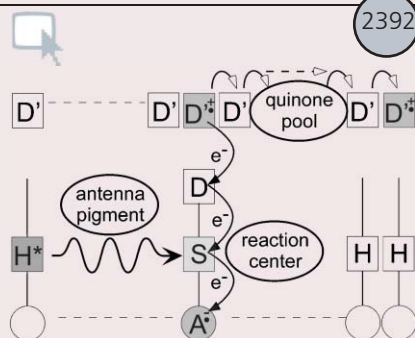


Octahedral metal clusters as building units in a neutral layered honeycomb network, [Zn(en)]₂[Nb₆Cl₁₂(CN)₆]

Bangbo Yan, Cynthia S. Day and Abdessadek Lachgar*

A novel organic–inorganic cluster compound with a double-layered honeycomb structure was successfully synthesized through the self-assembly of cyano-chloride octahedral niobium clusters and Zn(en) coordination complexes.

2392

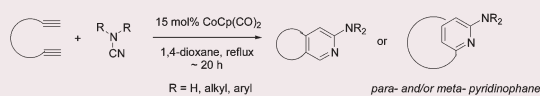


A simulation of key aspects of a primary process in natural photosynthesis by a Langmuir–Blodgett film assembly

Masaru Sakomura*, Kazuyoshi Ueda and Masamichi Fujihira

An advanced biomimetic model designed to replicate key aspects (antenna, reaction center, and quinone pool) of a primary process in natural photosynthesis is reported.

2394

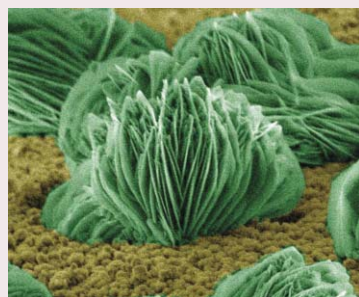


Cobalt-mediated cyclotrimerisation of bis-alkynes and cyanamides

Llorente V. R. Boñaga, Han-Cheng Zhang and Bruce E. Maryanoff*

CpCo(CO)₂-mediated cyclotrimerisation of bis-alkynes and cyanamides is effective for the synthesis of multisubstituted 2-aminopyridines, including macrocyclic products.

2396

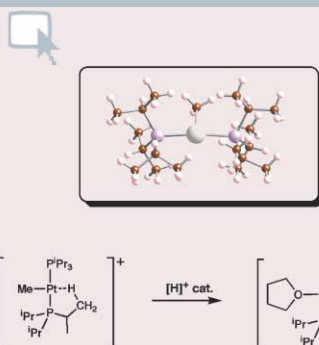


Novel Mg₂SiO₄ structures

R. L. D. Whitby*, K. S. Brigatti, I. A. Kinloch, D. P. Randall and T. Maekawa

The formation of novel Forsterite (Mg₂SiO₄) structures shows that they are comprised of a myriad of tightly packed leaf-like layers, each exhibiting a high aspect ratio from the nanometer to the micrometer scale.

2398

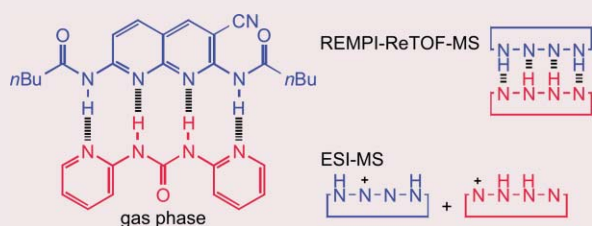


$[\text{PtMe}(\text{P}^i\text{Pr}_3)_2]^+$: a Pt(II) complex with an agostic interaction that undergoes C–H activation

Michael J. Ingleson*, Mary F. Mahon and Andrew S. Weller*

The T-shaped Pt(II) complex $[\text{PtMe}(\text{P}^i\text{Pr}_3)_2][1\text{-H-}closo\text{-CB}_{11}\text{Me}_{11}]$, which is stabilised by an agostic interaction, undergoes acid-catalysed intramolecular C–H activation in the presence of THF to afford cyclometallated $[\text{Pt}(\text{P}^i\text{Pr}_3)(\text{P}^i\text{Pr}_2\text{PCHMeCH}_2)(\text{THF})][1\text{-H-}closo\text{-CB}_{11}\text{Me}_{11}]$.

2400

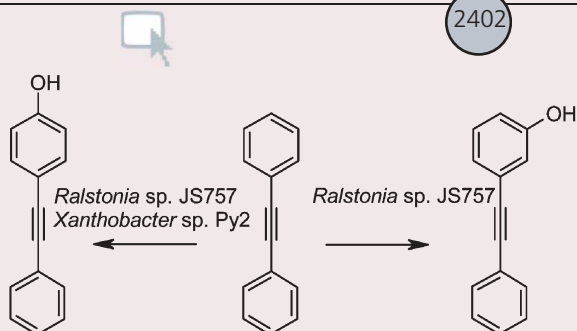


Multiple hydrogen bonds. Mass spectra of hydrogen bonded heterodimers. A comparison of ESI- and REMPI-ReTOF-MS

Jörg Taubitz, Ulrich Lüning* and Jürgen Grotemeyer*

REMPI-ReTOF-MS allows the observation of hydrogen bonded supramolecules in the gas phase when protonation of basic centers competes with cluster formation.

2402

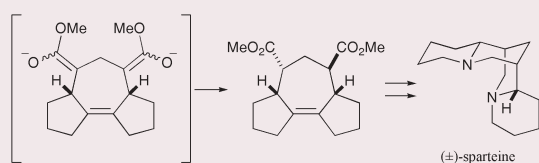


Biosynthesis of hydroxydiphenylacetylene by regiospecific monooxygenation

Heather R. Luckarift, Glenn R. Johnson and Jim C. Spain*

Bacterial monooxygenase enzymes catalyze a regiospecific single-step hydroxylation of diphenylacetylene to yield *meta*- and *para*-hydroxydiphenylacetylene.

2404

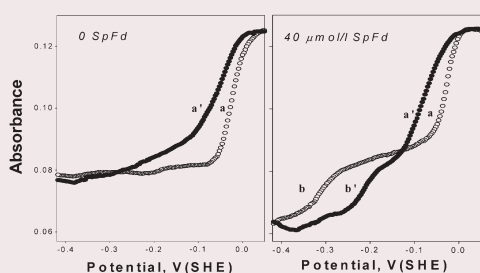


A synthesis of (±)-sparteine

Thomas Buttler and Ian Fleming*

(±)-Sparteine has been synthesised with chirality introduced relatively late using the protonation of a *meso* dienolate.

2406

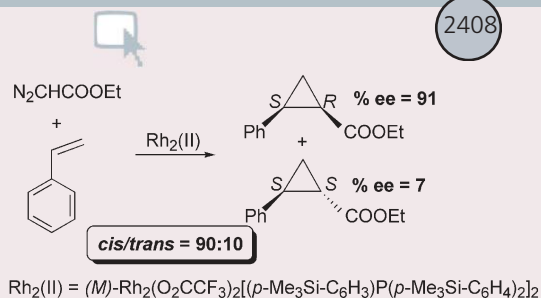


Substrate binding and the presence of ferredoxin affect the redox properties of the soluble plant Δ^9 -18:0-acyl carrier protein desaturase

V. Reipa, J. Shanklin and V. Vilker

Substrate-free Δ^9 -18:0-acyl carrier protein desaturase (abbreviated to Des) [E.C. # 1.14.99.6] was 2-electron reduced with $E^{n0} = -0.03 + -0.01$ V; presence of spinach ferredoxin (SpFd) induces additional 1-electron reduction wave at $E^{n0} = -0.21 + -0.02$ V, which shifts 0.106 V upon substrate binding.

2408

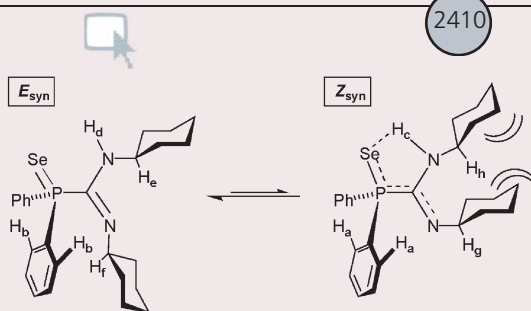


Enantio- and diastereocontrol in intermolecular cyclopropanation reaction of styrene catalyzed by dirhodium(II) complexes with bulky *ortho*-metalated aryl phosphines

Francisco Estevan, Pascual Lahuerta*, Julio Lloret, Mercedes Sanaú, M. Angeles Ubeda* and Jaume Vila

Steric factors greatly improve the diastereoselectivity of dirhodium(II) compounds with *ortho*-metalated phosphines in the cyclopropanation reaction of styrene.

2410

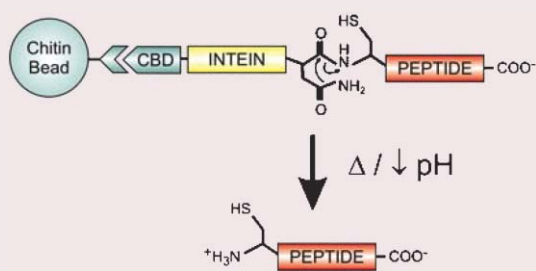


Self-organisation in *P*-substituted guanidines leading to solution-state isomerisation

Joanna Grundy, Martyn P. Coles*, Anthony G. Avent and Peter B. Hitchcock

The amidine unit within *P,P*-diphenyl-*N,N'*-dialkylchalcogenophosphinylformamidines, $\text{Ph}_2\text{P}(\text{E})\text{C}\{\text{NR}'\}\{\text{NHR}'\}$ [E = S, Se; R' = ⁱPr, Cy], self-organises through $\text{NH}\cdots\text{E}$ interactions which promote formation of the Z_{syn} isomer in solution.

2412

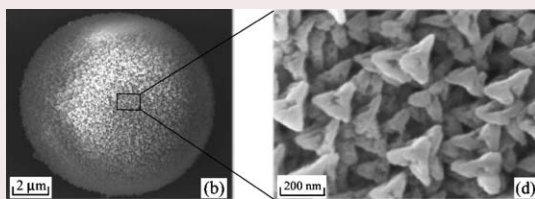


Intein-mediated purification of a recombinantly expressed peptide

John A. Pezza, Karen N. Allen and Dean R. Tolan*

A 26 amino acid peptide has successfully been purified *via* recombinant expression as an intein fusion protein accompanied by cleavage without the need for any exogenous proteases or cofactors, thus offering a practical, inexpensive approach to produce isotopically labelled peptides.

2414

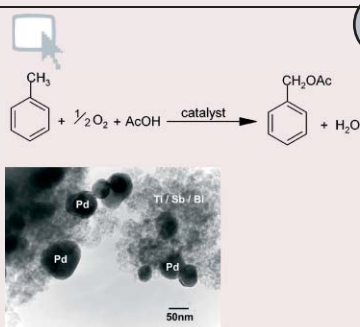


Facile fabrication and characterization of hierarchically porous calcium carbonate microspheres

Jiaguo Yu, Jimmy C. Yu*, Lizhi Zhang, Xinchun Wang and Ling Wu

Higher-order porous calcite microspheres exhibiting high specific surface areas, unusual morphologies and textures were produced by a simple precipitation reaction of CaCO_3 in the presence of a crystal modifier.

2416

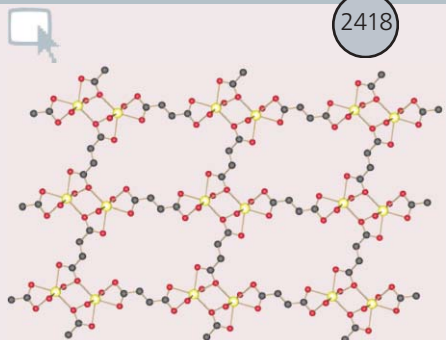


Development of highly active and selective novel Pd based acetoxylation catalysts and prevention of catalyst deactivation by Bi modification

A. Benhmid, K. V. Narayana, A. Martin*, B. Lücke and M.-M. Pohl

Remarkably high selectivity of benzyl acetate (*ca.* 95%) at higher conversion of toluene (*ca.* 70%) was achieved for the first time through vapour phase acetoxylation of toluene over Pd-Sb-Bi/TiO₂ novel catalysts and the method successfully overcomes the problem of catalyst deactivation.

2418

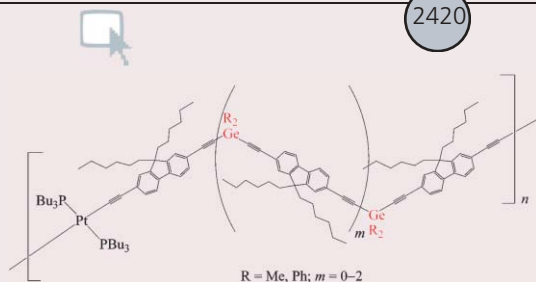


Assembly of a photoreactive coordination polymer containing rectangular grids

Adonis Michaelides*, Stavroula Skoulika and Michael G. Siskos

The reaction of Cd(II) with fumaric acid affords a grid-type coordination polymer in which the olefinic double bonds are only 3.38 Å apart. Upon irradiation a topochemical cycloaddition reaction takes place.

2420

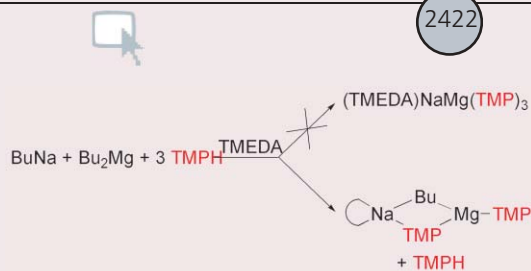


Oligo(fluorenyleneethynylene)germylene)s and their metallopolymer

Wai-Yeung Wong*, Suk-Yue Poon, Albert W.-M. Lee, Jian-Xin Shi and Kok-Wai Cheah

Oligo(fluorenyleneethynylene)germylene)s and their polyplatinynes are synthesized and photophysically characterized; inclusion of heavy germylene bridges greatly boosts the phosphorescence decay rate in metallopolymer.

2422

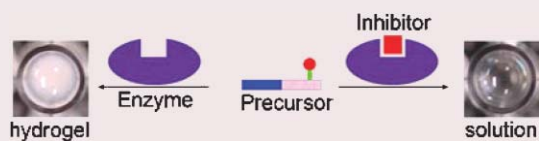


Isolation and characterisation of the mixed-metal alkyl amide [(TMEDA)Na(μ-Bu)(μ-TMP)Mg(TMP)], an unexpected chelate-trapped intermediate in the formation of inverse crowns

Eva Hevia, Daniel J. Gallagher, Alan R. Kennedy, Robert E. Mulvey*, Charles T. O'Hara and Christine Talmard

Surprisingly, only two-fold amination occurs when 3 molar equivalents of the secondary amine TMPH are offered to a 1 : 1 BuNa–Bu₂Mg mixture, emphasising the novel chemistry that can be promoted in mixed-metal systems.

2424

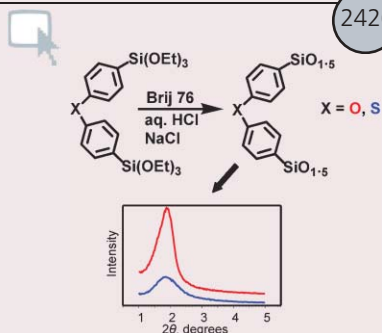


A simple visual assay based on small molecule hydrogels for detecting inhibitors of enzymes

Zhimou Yang and Bing Xu*

Directly coupling the hydrogelation of small molecules with enzymatic reactions provides a new approach for visually screening inhibitors for an enzyme.

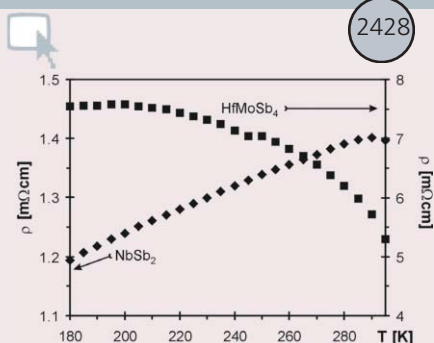
2426



Periodic mesoporous phenylsilicas with ether or sulfide hinge groups—a new class of PMOs with ligand channels

William J. Hunks and Geoffrey A. Ozin*

PMOs with 4-phenyl ether and 4-phenyl sulfide bridge-bonded silsesquioxanes integrated into the pore walls have been synthesized using inorganic salt-assisted self-assembly directed by a supramolecular Brij 76 template, to create a new class of PMOs with ligand channels.

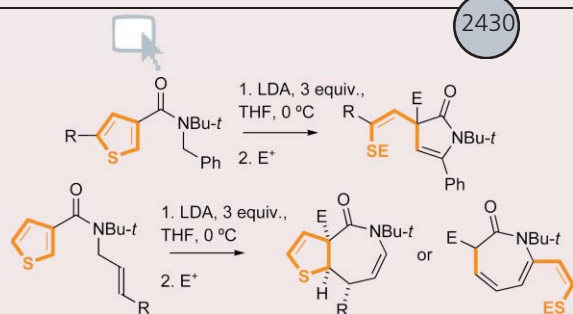


2428

HfMoSb₄, the first nonmetallic early transition metal antimonide

Shahab Derakhshan, Katja M. Kleinke, Enkhsetseg Dashjav and Holger Kleinke*

HfMoSb₄, isostructural with the isoelectronic NbSb₂, exhibits nonmetallic properties, as predicted *via* electronic structure calculations made before the actual discovery of HfMoSb₄.

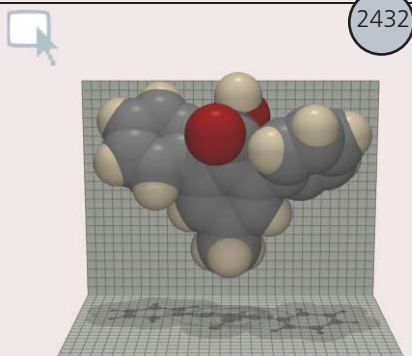


2430

Dearomatizing rearrangements of lithiated thiophenecarboxamides

Jonathan Clayden*, Rachel Turnbull, Madeleine Helliwell and Ivan Pinto

Rearrangements of lithiated thiophene-3-carboxamides bearing allylic or benzylic *N*-substituents provide three families of nitrogen heterocycles in which part of the old aromatic thiophene ring features as a synthetically versatile thiovinyl group.

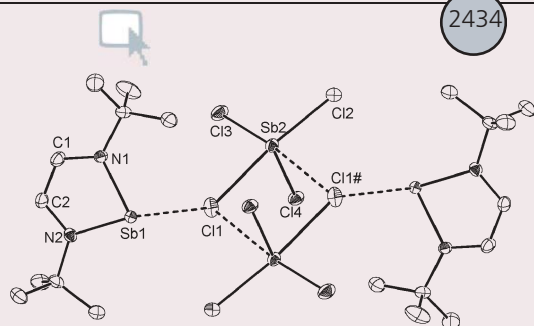


2432

***m*-Terphenyl thiols: rigid and bulky molecules for the formation of bioactive self-assembled monolayers on gold**

Diane A. Dickie, Andy Y. C. Chan, Hanifa Jalali, Hilary A. Jenkins, Hua-Zhong Yu* and Jason A. C. Clyburne*

Bulky *m*-terphenyls provide a new route to low-density surfaces since the functional groups placed within the *m*-terphenyl pocket are well-isolated from neighbouring molecules.

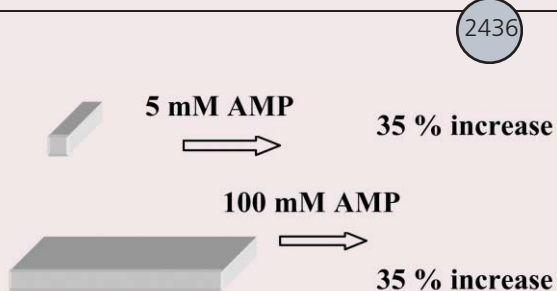


2434

Synthesis and unprecedented oxidation of a cationic Sb-analogue of an Arduengo's carbene

Dietrich Gudat*, Timo Gans-Eichler and Martin Nieger

2-Chloro-1,3,2-diazastibolenes react with Lewis acids either *via* Sb–Cl cleavage to yield stable Sb-analogues of an N-heterocyclic carbene, or *via* an unprecedented oxidative fragmentation to give a diazadiene–SbCl₃ complex.



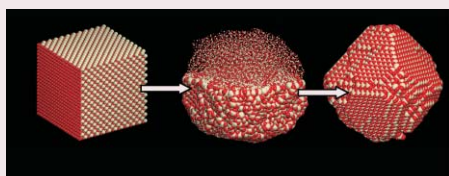
2436

Sensitivity increase in molecular recognition by decrease of the sensing particle size and by increase of the receptor binding site – a case with chemomechanical polymers

Hans-Jörg Schneider*, Liu Tianjun and Nino Lomadze

Diminishing the particle size of a chemomechanical polymer leads to a dramatic sensitivity increase, with a large response triggered *e.g.* by action of external AMP.

2438

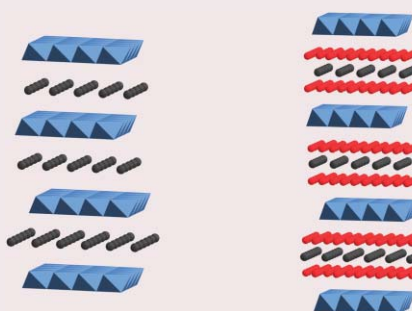


Shape of CeO₂ nanoparticles using simulated amorphisation and recrystallisation

Thi X. T. Sayle, Stephen C. Parker and Dean C. Sayle*

Graphic depicting the amorphisation and recrystallisation strategy. Left: starting structure; middle: amorphous transition; right: final recrystallised structure.

2440

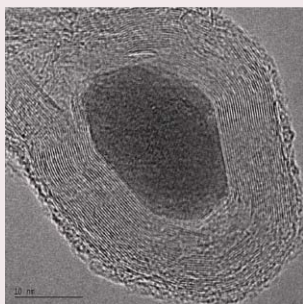


A new series of sodium cobalt oxyhydrates

Sundip Mistry, Donna C. Arnold, Chris J. Nuttall, Alexandros Lappas and Mark A. Green

β -NaCoO₂ is shown to undergo the same sequence of sodium deintercalation and water hydration as the related superconducting γ -phase. Lack of superconductivity in the β -phase demonstrates the importance of the stacking sequence on the resultant electronic properties.

2442

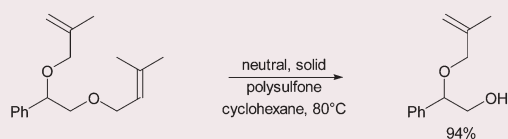


Direct conversion of iron stearate into magnetic Fe and Fe₃C nanocrystals encapsulated in polyhedral graphite cages

Junfeng Geng, David A. Jefferson and Brian F. G. Johnson*

We report a direct salt-conversion approach for bulk synthesis of carbon-encapsulated magnetic Fe and Fe₃C nanoparticles.

2444

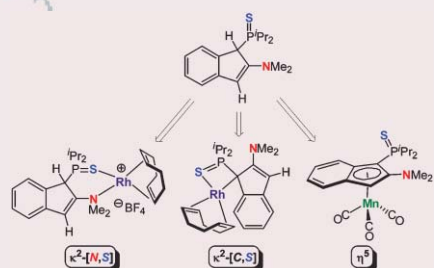


Polysulfones: solid organic catalysts for the chemoselective cleavage of methyl-substituted allyl ethers under neutral conditions

Dean Marković, Peter Steunenberg, Martin Ekstrand and Pierre Vogel*

A new method of polyol protection/deprotection is presented. The polysulfone made of SO₂ and methylenecyclopentane induces cleavage of allyl ethers with the reactivity sequence: 2-methylprenyl > prenyl > methallyl >> allyl.

2446

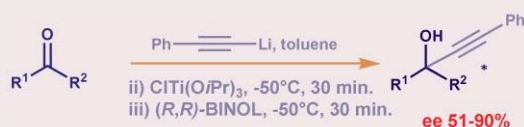


Structurally diverse Rh(I) and Mn(I) complexes derived from the new ambidentate indene ligand, (1-{ⁱPr₂P(S)}-2-{NMe₂})C₉H₆

Dominik Wechsler, Robert McDonald, Michael J. Ferguson and Mark Stradiotto*

A new indene ligand featuring pendant ⁱPr₂P(S) and NMe₂ substituents has been developed that exhibits diverse binding to Rh(I) and Mn(I) fragments.

2448

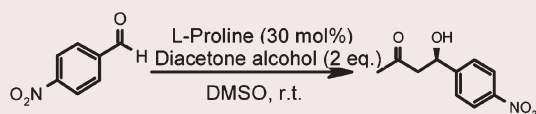


BINOL catalyzed enantioselective addition of titanium phenylacetylide to aromatic ketones

Pier Giorgio Cozzi* and Silvia Alesi

Titanium reagents for poorly electrophilic ketones! An enantioselective addition of titanium phenylacetylide to ketones promoted by BINOL is described.

2450

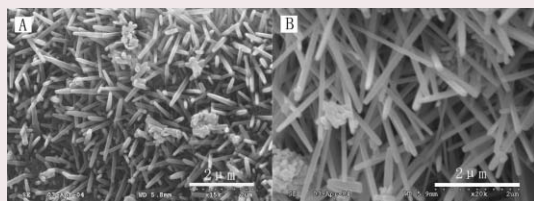


L-Proline catalyzed asymmetric transfer aldol reaction between diacetone alcohol and aldehydes

S. Chandrasekhar*, Ch. Narsihmulu, N. Ramakrishna Reddy and S. Shameem Sultana

We demonstrate for the first time, L-proline as a chiral catalyst for transfer aldol reaction between aldehydes and diacetone alcohol.

2452

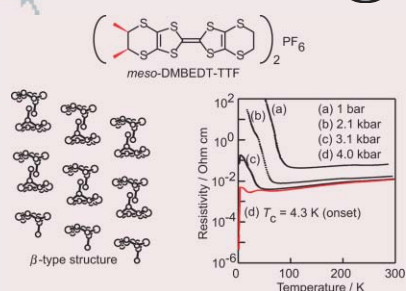


A facile synthesis of single-crystal mullite nanobelts

Bing Zhang, Chuanbao Cao*, Xu Xiang and Hesun Zhu

Single-crystal mullite nanobelts were prepared by a simple sol-gel method using WO_3 as a catalyst. The nanobelts are straight and uniform with a width of 200 nm and length of 3–4 μm .

2454

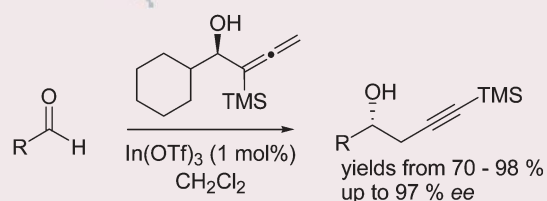


A new organic superconductor β -(*meso*-DMBEDT-TTF) $_2\text{PF}_6$

Shinya Kimura, Tomoko Maejima, Hideaki Suzuki, Ryoma Chiba, Hatsumi Mori*, Tadashi Kawamoto, Takehiko Mori, Hiroshi Moriyama, Yutaka Nishio and Koji Kajita

A newly synthesized donor *meso*-DMBEDT-TTF afforded a superconducting salt β -(*meso*-DMBEDT-TTF) $_2\text{PF}_6$, with a transition temperature at 4.3 K (onset) under a hydrostatic pressure of 4.0 kbar.

2456

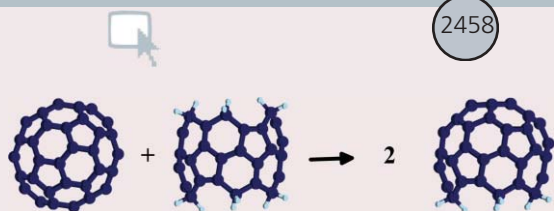


Silicon-assisted propargylic transfer to aldehydes

Kiew-Ching Lee, Man-Jing Lin and Teck-Peng Loh*

A new and efficient method of obtaining homopropargylic alcohols *via* homopropargylic transfer from the allenic alcohol to various aldehydes in the presence of Lewis acid catalysts.

2458

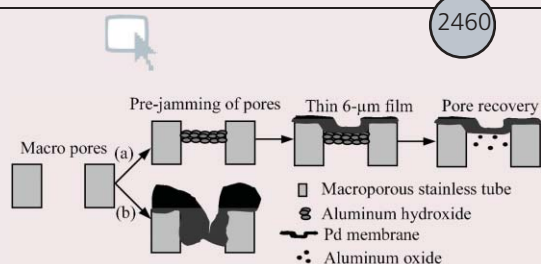


Bond energy, aromatic stabilization energy and strain in IPR fullerenes

Michał K. Cyrański*, Siân T. Howard and Michał L. Chodkiewicz

The cyclic π electron delocalisation does not stabilize the fullerene C₆₀ formation and 5–6 and 6–6 types of CC bonds have near identical bond stretch potentials.

2460

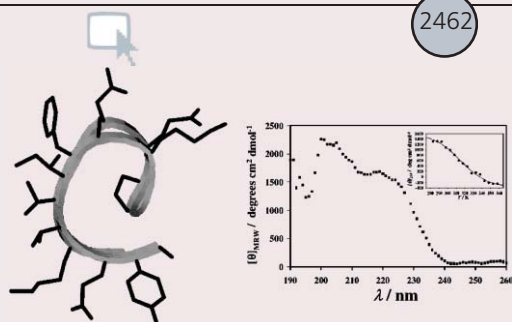


Thin Pd membrane prepared on macroporous stainless steel tube filter by an *in-situ* multi-dimensional plating mechanism

Jianhua Tong* and Yasuyuki Matsumura

Thin dense Pd membrane was directly prepared on a macroporous stainless steel tube filter by a multi-dimensional plating mechanism shown in route (a).

2462

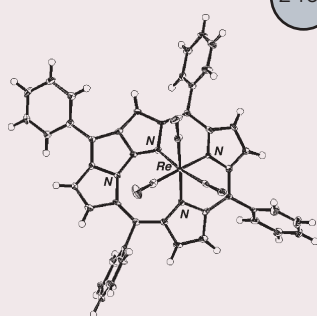


Stereospecific peptide folds. A rationally designed molecular bracelet

Soumendra Rana, Bijoy Kundu and Susheel Durani*

A canonical planar β -hairpin peptide stereochemically reengineered to a semicircular bracelet type motif by L-to-D stereochemical inversion in two pairs of its cross-strand neighbor residues displays protein-like ordering including two-state behavior in H₂O, which is unusual for a small peptide of this size.

2464

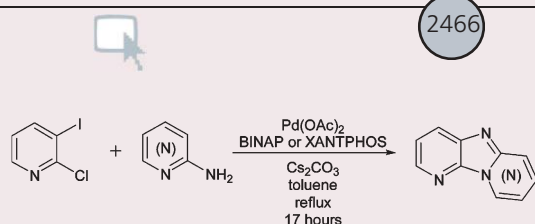


Synthesis and properties of rhenium tricarbonyl complex bearing N-fused tetraphenylporphyrin ligand

Motoki Togano, Tomoya Ishizuka and Hiroyuki Furuta*

An N-fused porphyrin rhenium complex was synthesized by the thermal reaction of an N-confused porphyrin with Re₂(CO)₁₀ and its structure was determined by X-ray crystallographic analysis.

2466

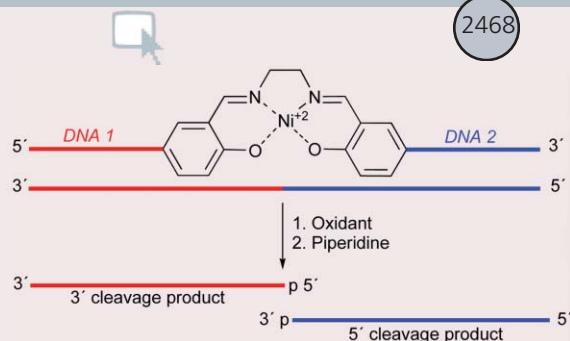


The first tandem double palladium-catalyzed aminations: synthesis of dipyrido[1,2-*a*:3',2'-*d*]imidazole and its benzo- and aza-analogues

Kristof T. J. Loones, Bert U. W. Maes*, Roger A. Dommissie and Guy L. F. Lemière

A new strategy for the synthesis of the title compounds *via* a regio- and chemoselective one-pot inter- and intramolecular Buchwald–Hartwig amination of 2-chloro-3-iodopyridine with aminoazines and -diazines is reported.

2468

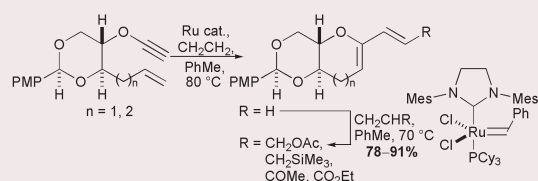


Site-specific oxidative cleavage of DNA by metallo-salen–DNA conjugates

Jennifer L. Czapinski and Terry L. Sheppard*

Metallo-salen–DNA conjugates, prepared by template-directed synthesis, were used to target oxidative adduct formation and subsequent cleavage of complementary DNA sequences. The reaction displayed remarkable selectivity for deoxyguanosine residues in the complementary strand.

2470

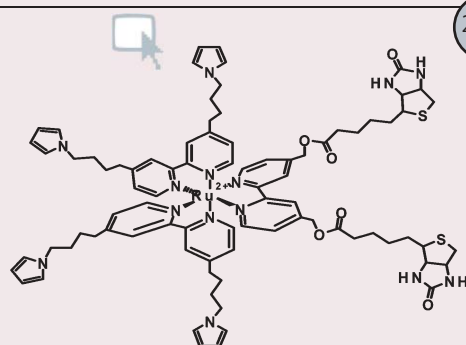


Construction of building-blocks for polyether synthesis using sequential catalytic ring-closing enyne and cross metathesis

J. Stephen Clark*, Frédéric Elustondo and Marc C. Kimber

Ring-closing metathesis of alkynyl ethers and subsequent cross metathesis of the resulting dienes delivers six- and seven-membered cyclic ethers bearing a variety of unsaturated side chains, in good yield. Independent functionalisation of the exocyclic and endocyclic portions of the cross metathesis products is then possible.

2472

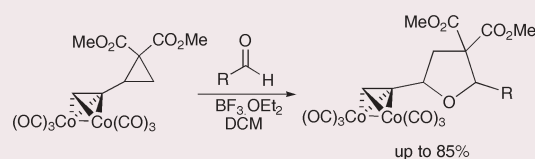


Electrogeneration of a biotinylated poly(pyrrole–ruthenium(II)) film for the construction of photoelectrochemical immunosensor

Naoufel Haddour, Serge Cosnier* and Chantal Gondran

A new tris(bipyridyl)ruthenium(II) complex bearing pyrrole and biotin groups has been electropolymerized and applied to the photoelectrochemical detection of anti-cholera toxin.

2474

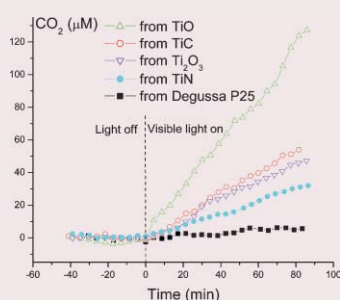


Novel formation and use of a Nicholas carbocation in the synthesis of highly substituted tetrahydrofurans

Steven D. R. Christie*, Ryan J. Davoile, Mark R. J. Elsegood, Ross Fryatt, Raymond C. F. Jones* and Gareth J. Pritchard

A novel formation of a Nicholas carbocation through cleavage of a C–C bond has allowed the formation of tetrahydrofuran derivatives in a formal dipolar cycloaddition reaction.

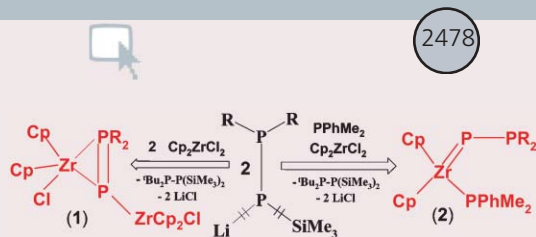
2476



Structural defects cause TiO₂-based photocatalysts to be active in visible light

Igor N. Martyanov, Sitharaman Uma, Shalini Rodrigues and Kenneth J. Klabunde

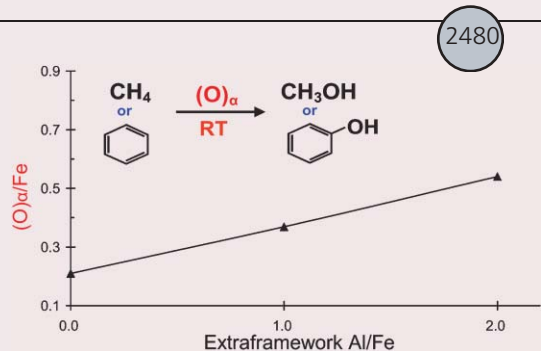
There are numerous reports involving additives to TiO₂ to cause visible-light photocatalytic activity. However, in this Communication it is shown that only defect sites in the bulk of TiO₂ are needed to cause visible light photocatalytic activity for the oxidation of acetaldehyde to form carbon dioxide. The figure shows activities for TiO₂ samples prepared by heating certain precursors in oxygen.



A new synthetic entry to phosphinophosphinidene complexes. Synthesis and structural characterisation of the first side-on bonded and the first terminally bonded phosphinophosphinidene zirconium complexes $[\mu-(1,2:2-\eta^4\text{-Bu}_2\text{P}=\text{P})\{\text{Zr}(\text{Cl})\text{Cp}_2\}_2]$ and $[\{\text{Zr}(\text{PPhMe}_2)\text{Cp}_2\}(\eta^1\text{-P}=\text{P}^t\text{Bu}_2)]$

Jerzy Pikies*, Elke Baum, Eberhard Matern, Jarosław Chojnacki, Rafał Grubba and Andrzej Robaszkiewicz

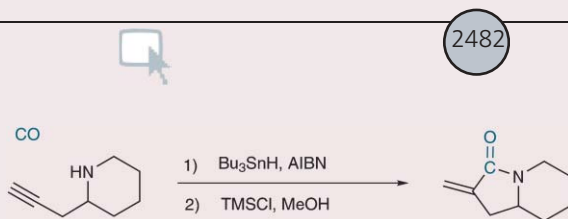
$^t\text{Bu}_2\text{P}-\text{P}(\text{SiMe}_3)\text{Li}$ reacts with $[\text{Cp}_2\text{ZrCl}_2]$ yielding complex **1** with side-on bonded phosphinophosphinidene ligand (**1**) and, in the presence of PPhMe_2 , yielding complex (**2**) with this ligand terminally bonded.



Enhancement of α -oxygen formation and N_2O decomposition on Fe/ZSM-5 catalysts by extraframework Al

Keqiang Sun, Haidong Zhang, Haian Xia, Yuxiang Lian, Ying Li, Zhaochi Feng, Pinliang Ying and Can Li*

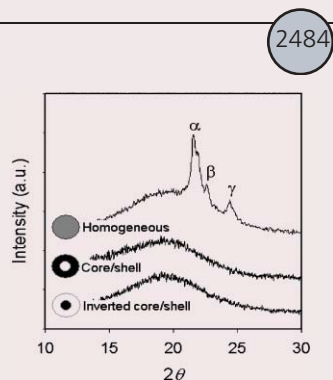
The α -oxygen on Fe/ZSM-5 shows biomimetic catalysis of oxidizing of methane to methanol and of benzene to phenol at RT. The introduction of extraframework Al results in a linear increase of the α -oxygen concentration.



Intramolecular nucleophilic carbonyl trapping of α -ketenyl radicals by an amino group

Mami Tojino, Yoshitaka Uenoyama, Takahide Fukuyama and Ilhyong Ryu*

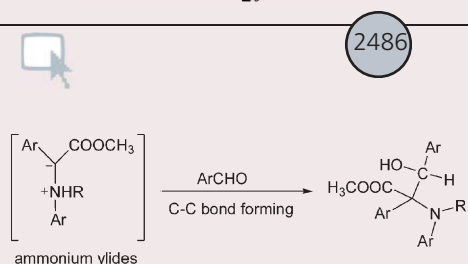
Tin radical-mediated carbonylation of ω -alkynylamines proceeded with cyclization to give unsaturated lactams. Nucleophilic trapping of α -ketenyl radicals by an internal amino group is believed to serve as the first key.



Synthesis of core-shell polyurethane-urea nanoparticles containing 4,4'-methylenedi-*p*-phenyl diisocyanate and isophorone diisocyanate by self-assembled neutralization emulsification

In Woo Cheong* and Jung Hyun Kim

The particle morphology of polyurethane-urea nanoparticles containing 4,4'-methylenedi-*p*-phenyl diisocyanate and isophorone diisocyanate can be controlled by manipulating the reaction sequence and consequent molecular rearrangement affected their film properties.

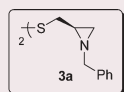
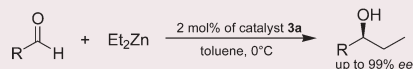


Novel C-C bond formation through addition of ammonium ylides to arylaldehydes: a facile approach to β -aryl- β -hydroxy α -amino acid frameworks

Yuanhua Wang, Zhiyong Chen, Aiqiao Mi and Wenhao Hu*

Ammonium ylides generated *in situ* from α -diazo esters and amines in the presence of catalytic $\text{Rh}_2(\text{OAc})_4$, undergo an aldol-type reaction with aldehydes affording highly substituted amino acid frameworks in a convergent, three-component reaction.

2488

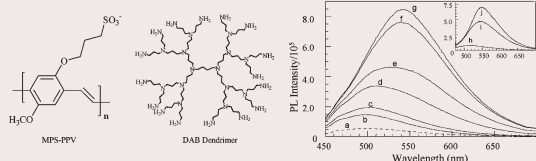


Aziridine sulfides and disulfides as catalysts for the enantioselective addition of diethylzinc to aldehydes

Antonio L. Braga*, Priscila Milani, Marcio W. Paixão, Gilson Zeni, Oscar E. D. Rodrigues and Elenilson F. Alves

Chiral aziridine sulfides and disulfides were synthesized from readily available and inexpensive *R*-cysteine by a Mitsunobu reaction; their application in the addition of diethylzinc to aldehydes provides secondary alcohols with up to 99% *ee* and *S*-configuration.

2490



Enhanced photoluminescence from poly(phenylene vinylene) : dendrimer polyelectrolyte assemblies in solution

Gabriel A. Montañó, Andrew M. Dattelbaum, Hsing-Lin Wang and Andrew P. Shreve*

Poly(2,5-methoxy-propyloxy sulfonate phenylene vinylene) (MPS-PPV) and DAB-Am-16, a generation 3.0 polypropylenimine hexadecamine dendrimer (DAB), are shown to form a tunable photoresponsive polyelectrolyte assembly in aqueous solution with an enhanced emission signal of up to 18-times that of MPS-PPV alone.

2492

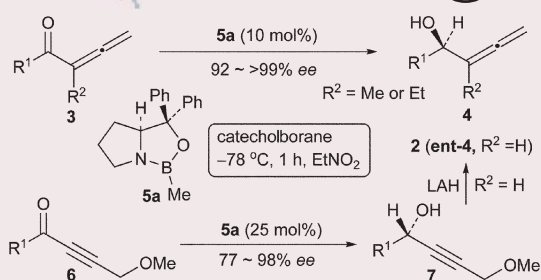


Chiral discrimination within disordered adlayers on metal surfaces

Andrew Mulligan, Ian Lane, Gilles B. D. Rousseau, Lutz Hecht, Shona M. Johnston, David Lennon and Malcolm Kadodwala*

Using a novel non-linear optical technique enantiomeric excess within a translationally disordered overlayer on a metal surface has been monitored for the first time.

2494

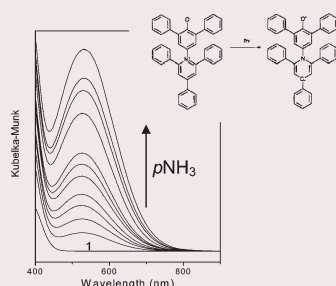


Enantioselective synthesis of allenyl carbinols by the CBS reduction in nitroethane: dramatic solvent effect for reactivity and enantioselectivity

Chan-Mo Yu*, Chunsan Kim and Jae-Hong Kweon

Enantioselective synthesis of allenyl carbinols **2** and **4** from the corresponding allenyl ketones **1** and **3**, or α,β -ynones **6** by the CBS reduction in nitroethane has been accomplished in high levels of enantioselectivity.

2496

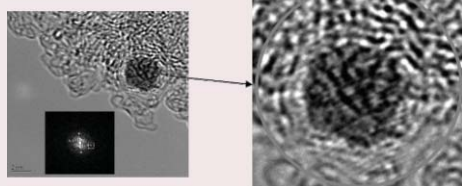


Mesostructured SBA-3 silica containing Reichardt's dye as an optical ammonia sensor

Barbara Onida, Luisa Borello, Sonia Fiorilli, Barbara Bonelli, C. Otero Areán and Edoardo Garrone

An optical sensing system reversibly responding to gaseous ammonia has been prepared incorporating Reichardt's dye in mesostructured silica/CTABr composite. The response time is a few seconds, the intensity is proportional to ammonia partial pressure and the sensitivity can be tailored by changing the dye content in the mesophase.

2498

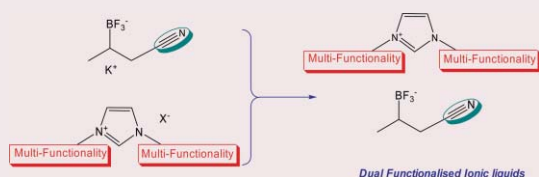


Molecular sieving platinum nanoparticle catalysts kinetically frozen in nanoporous carbon

Ramakrishnan Rajagopalan, Ayyappan Ponnaiyan, Pratik J. Mankidy, Anthony W. Brooks, Bo Yi and Henry C. Foley*

Highly active nanocomposites have been formed that are excellent candidates for new catalytic applications including fuel cells, pharmaceutical synthesis and biomass conversion.

2500

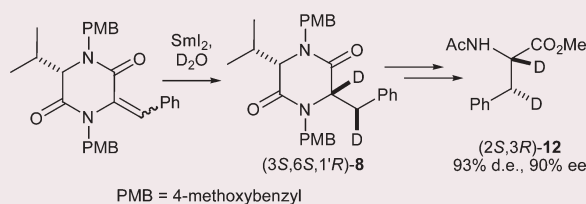


Dual-functionalised ionic liquids: synthesis and characterisation of imidazolium salts with a nitrile-functionalised anion

Dongbin Zhao, Zhaofu Fei, C. André Ohlin, Gábor Laurenczy and Paul J. Dyson*

A series of 'dual-functionalised' ionic liquids, comprising imidazolium cations with various functionalities and the nitrile functionalised anion $[\text{CH}_3\text{CH}(\text{BF}_3)\text{CH}_2\text{CN}]^-$ have been prepared; some exhibit very low viscosities—a highly valuable property in many applications.

2502

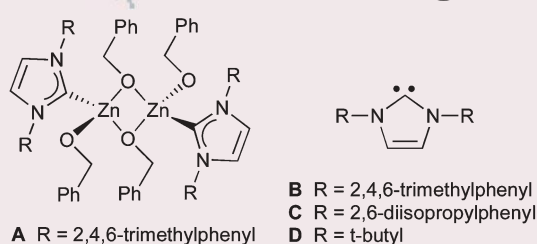


Diastereoselective conjugate reduction with samarium diiodide: asymmetric synthesis of methyl (2*S*,3*R*)-*N*-acetyl-2-amino-2,3-dideuterio-3-phenylpropionate

Stephen G. Davies*, Humberto Rodríguez-Solla, Juan A. Tamayo, A. Christopher Garner and Andrew D. Smith

The first highly diastereoselective and enantioselective conjugate reduction with SmI_2 has been demonstrated on a homochiral diketopiperazine template, allowing the asymmetric synthesis of methyl (2*S*,3*R*)-*N*-acetyl-2-amino-2,3-dideuterio-3-phenylpropionate.

2504

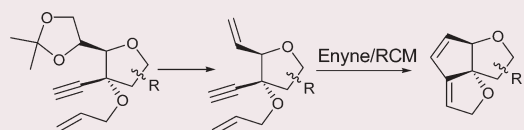


Stereoselective polymerization of *D,L*-lactide using *N*-heterocyclic carbene based compounds

Tryg R. Jensen, Laurie E. Breyfogle, Marc A. Hillmyer* and William B. Tolman*

A new Zn alkoxide catalyst (**A**) supported by an *N*-heterocyclic carbene rapidly polymerizes *D,L*-lactide (*D,L*-LA) to heterotactic enriched poly(lactide) (PLA), while the free carbene and analogs (**B–D**) instead yield highly isotactic enriched PLA.

2506

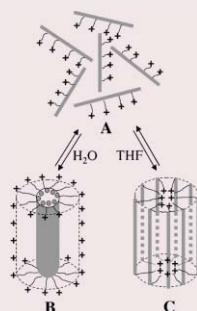


A cascade enyne/ring closing metathesis approach to angularly fused dioxatriquinanes

Krishna P. Kaliappan* and Rahul S. Nandurdikar

An expedient and first tandem enyne/ring closing metathesis approach on a sugar furanose template leading to a novel angularly fused dioxatriquinane is described here.

2508

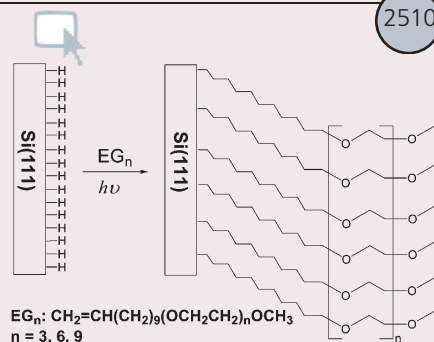


Solvent-dependent aggregation of a water-soluble poly(fluorene) controls energy transfer to chromophore-labeled DNA

Shu Wang and Guillermo C. Bazan*

The solvent-dependent aggregation properties of a water-soluble cationic poly(fluorene) are studied and used to control fluorescence resonance energy transfer to Texas Red-labeled DNA.

2510

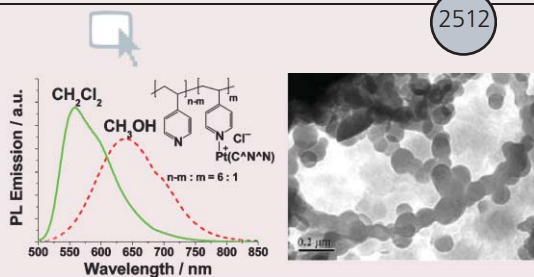


Protein-resistant monolayers prepared by hydrosilylation of α -oligo(ethylene glycol)- ω -alkenes on hydrogen-terminated silicon (111) surfaces

Chi Ming Yam, Juan Manuel Lopez-Romero, Jianhua Gu and Chengzhi Cai*

Atomically flat, homogeneous, and protein-resistant monolayers can be readily prepared on H-Si(111) surfaces by photo-induced hydrosilylation of α -oligo(ethylene glycol)- ω -alkenes.

2512

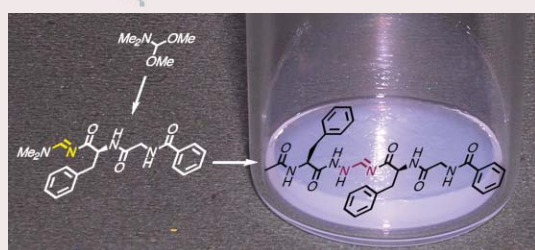


Self-aggregated phosphorescent platinum(II) polymeric material from modified poly(4-vinylpyridine)

Chi-Chung Kwok, Sze-Chit Yu, Iona H. T. Sham and Chi-Ming Che*

The strategy of using a chromophore to functionalize homopolymers, which provides an entry to new classes of photoluminescent polymeric materials with potential applications in luminescent signaling, is demonstrated with PVP-Pt(C[^]N[^]N) (HC[^]N[^]N = 4-(4-methoxyphenyl)-6-phenyl-2,2'-bipyridine)

2514



Modular synthesis of formamidines and their formation of stable organogels

David D. Díaz and M. G. Finn*

An improvement in the practical aspects of formamidine synthesis has resulted in the discovery of a class of compounds which produce organogels in protic solvents, presumably through intermolecular hydrogen bonding and π - π stacking interactions.

COPIES OF CITED ARTICLES

The Library and Information Centre (LIC) of the RSC offers a first class Document Delivery Service for items in Chemistry and related subjects. Contact the LIC, The Royal Society of Chemistry, Burlington House, Piccadilly, London W1V 0BN, UK.

This service is only available from the LIC in London and not the RSC in Cambridge.

Tel: +44 (0) 20 7437 8656; Fax: +44 (0) 20 7287 9798; E-mail: library@rsc.org

FREE E-MAIL ALERTING SERVICE

Contents lists in advance of publication are available on the web via www.rsc.org/chemcomm — or take advantage of our free e-mail alerting service (www.rsc.org/ej_alert) to receive notification each time a new list becomes available.

ADVANCE ARTICLES AND ELECTRONIC JOURNAL

Free site-wide access to Advance Articles and electronic form of this journal is provided with a full-rate institutional subscription. See www.rsc.org/ejs for more information.

* Indicates the author for correspondence: see article for details.



Electronic supplementary information is available on <http://www.rsc.org/esi>: see article for further information.