

# ChemComm

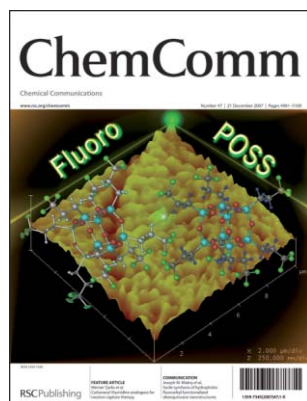
Chemical Communications

[www.rsc.org/chemcomm](http://www.rsc.org/chemcomm)

RSC Publishing is a not-for-profit publisher and a division of the Royal Society of Chemistry. Any surplus made is used to support charitable activities aimed at advancing the chemical sciences. Full details are available from [www.rsc.org](http://www.rsc.org)

## IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS (47) 4961-5100 (2007)



### Cover

See Joseph M. Mabry *et al.*, pp. 4992–4994.  
Molecular and surface visualization of fluorinated polyhedral oligomeric silsesquioxanes (F-POSS). F-POSS can be corner-capped with trifluoropropyl (left), methyl (right), or other organic groups for tunable hydrophobicity. Image reproduced by permission of Scott T. Iacono, Ashwani Vij, Wade Grabow, Dennis W. Smith, Jr. and Joseph M. Mabry from *Chem. Commun.*, 2007, 4992.

## CHEMICAL SCIENCE

C89

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.

## Chemical Science

December 2007/Volume 4/Issue 12

[www.rsc.org/chemicalscience](http://www.rsc.org/chemicalscience)

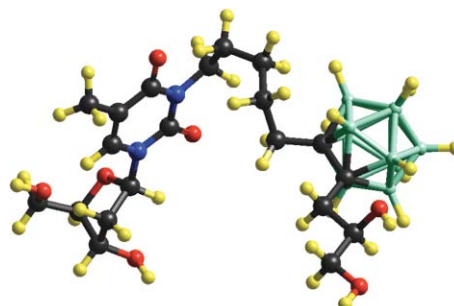
## FEATURE ARTICLE

4978

### Carboranyl thymidine analogues for neutron capture therapy

Werner Tjarks,\* Rohit Tiwari, Youngjoo Byun, Sureshbabu Narayanasamy and Rolf F. Barth

The chemical, structural, and biological properties of 3CTAs (3-carboranyl thymidine analogues), a novel class of neutron capture therapy (NCT) agents, are discussed.



## EDITORIAL STAFF

### Editor

Sarah Thomas

### Deputy editor

Kathryn Sear

### Assistant editors

Emma Shiells, Alison Stoddart, Joanne Thomson, Kathleen Too, Jenna Wilson

### Publishing assistants

Jackie Cockrill, Jayne Gough, Rachel Hegarty

### Team leader, serials production

Helen Saxton

### Technical editors

Celia Clarke, Nicola Convine, Alan Holder, Laura Howes, Sandra Jones, David Parker, Ken Wilkinson

### Production administration coordinator

Sonya Spring

### Administration assistants

Clare Davies, Donna Fordham, Julie Thompson

### Publisher

Emma Wilson

Chemical Communications (print: ISSN 1359-7345; electronic: ISSN 1364-548X) is published 48 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF. All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to RSC Distribution Services, c/o Portland Customer Services, Commerce Way, Colchester, Essex, UK CO2 8HP. Tel +44 (0)1206 226050; E-mail sales@rscdistribution.org

2007 Annual (print + electronic) subscription price: £1832; US\$3462. 2007 Annual (electronic) subscription price: £1649; US\$3116. 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

© The Royal Society of Chemistry, 2007. 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.

# ChemComm

Chemical Communications

www.rsc.org/chemcomm

## EDITORIAL BOARD

### Chairman

Roeland J. M. Nolte, Nijmegen, The Netherlands  
nolte@sci.kun.nl

### Associate Editors

P. Andrew Evans, Liverpool, UK  
andrew.evans@liverpool.ac.uk  
Jonathan L. Sessler, Austin, USA  
chemcommun@cm.utexas.edu  
T. Don Tilley, Berkeley, USA  
chemcomm@berkeley.edu

### Scientific Editors

Alois Fürstner, Mülheim, Germany  
fuerstner@mpi-muelheim.mpg.de  
Mir Wais Hosseini, Strasbourg, France  
hosseini@chimie.u-strasbg.fr

### Members

Shankar Balasubramanian, Cambridge, UK  
sb10031@cam.ac.uk  
Penny Brothers, Auckland, New Zealand  
p.brothers@auckland.ac.nz

Jillian M. Buriak, Edmonton, Canada  
jburiak@ualberta.ca

Ben L. Feringa, Groningen, The Netherlands  
feringa@chem.rug.nl

David Haddleton, Warwick, UK  
D.M.Haddleton@warwick.ac.uk

Peter Kündig, Geneva, Switzerland  
Peter.Kundig@chiorg.unige.ch

Nazarío Martín, Madrid, Spain  
nazmar@quim.ucm.es

Keiji Maruoka, Kyoto, Japan  
maruoka@kuchem.kyoto-u.ac.jp

Ryong Ryoo, Taejeon, Korea  
rryoo@kaist.ac.kr

Ferdi Schüth, Mülheim, Germany  
schueth@mpi-muelheim.mpg.de

Nicholas J. Turner, Manchester, UK  
nicholas.turner@manchester.ac.uk

## ADVISORY BOARD

Varinder Aggarwal, Bristol, UK  
Frank Allen, CCDC, Cambridge, UK  
Jerry L. Atwood, Columbia, USA  
Amit Basak, Kharagpur, India  
Dario Braga, Bologna, Italy  
Xiao-Ming Chen, Guangzhou, China  
Derrick Clive, Alberta, Canada  
Marcetta Darensbourg, College Station, USA  
Scott E. Denmark, Urbana, USA  
Shaojun Dong, Changchun, China  
Chris Easton, Canberra, Australia  
Gregory C. Fu, Cambridge, USA  
Tohru Fukuyama, Tokyo, Japan  
Lutz Gade, Heidelberg, Germany  
Philip Gale, Southampton, UK  
George W. Gokel, St Louis, USA  
Trevor Hambley, Sydney, Australia  
Craig Hawker, Santa Barbara, USA  
Andrew B. Holmes, Melbourne, Australia  
Amir Hoveyda, Boston, USA  
Steven M. Howdle, Nottingham, UK  
Taeghwan Hyeon, Seoul, Korea  
Biao Jiang, Shanghai, China  
Karl Anker Jørgensen, Aarhus, Denmark  
Kimoan Kim, Pohang, Korea

Susumu Kitagawa, Kyoto, Japan  
Shu Kobayashi, Tokyo, Japan  
Jérôme Lacour, Geneva, Switzerland  
Teck-Peng Loh, Singapore  
Tien-Yau Luh, Taipei, Taiwan  
Doug MacFarlane, Monash, Australia  
David MacMillan, Princeton, USA  
Seth Marder, Atlanta, USA  
Ilan Marek, Haifa, Israel  
E. W. 'Bert' Meijer, Eindhoven, The Netherlands  
Achim Müller, Bielefeld, Germany  
Catherine Murphy, South Carolina, USA  
Atsuhiko Osuka, Kyoto, Japan  
Ian Paterson, Cambridge, UK  
Maurizio Prato, Trieste, Italy  
C. N. R. Rao, Bangalore, India  
Christopher A. Reed, Riverside, USA  
Robin Rogers, Alabama, USA  
Michael Sailor, San Diego, USA  
Jonathan W. Steed, Durham, UK  
Zhong-Qun Tian, Xiamen, China  
Carsten Tschierske, Halle, Germany  
Herbert Waldmann, Dortmund, Germany  
Henry N. C. Wong, Hong Kong, China  
Eiji Yashima, Nagoya, Japan

**Advertisement sales:** Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017; E-mail advertising@rsc.org

© 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.

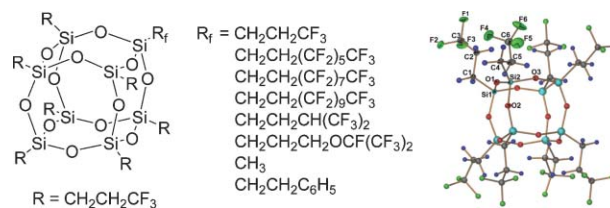
Authors may reproduce/republish portions of their published contribution without seeking permission from the RSC, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of The Royal Society of Chemistry.

4992

### Facile synthesis of hydrophobic fluoroalkyl functionalized silsesquioxane nanostructures

Scott T. Iacono, Ashwani Vij, Wade Grabow, Dennis W. Smith, Jr. and Joseph M. Mabry\*

New fluorinated polyhedral oligomeric silsesquioxane (F-POSS) structures possessing a high degree of hydrophobicity have been prepared by employing a corner-capping methodology.



4995

### Construction of a small-molecule-integrated semisynthetic split intein for *in vivo* protein ligation

Tomomi Ando, Shinya Tsukiji, Tsutomu Tanaka and Teruyuki Nagamune\*

Design and construction of a small-molecule-integrated semisynthetic split intein that can be used for protein ligation and protein semisynthesis on the cell surface and potentially inside cells is described.

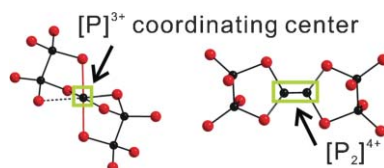


4998

### Low valent phosphorus in the molecular anions $[\text{P}_5\text{Se}_{12}]^{5-}$ and $\beta\text{-}[\text{P}_6\text{Se}_{12}]^{4-}$ : phase change behavior and near infrared second harmonic generation

In Chung, Joon I. Jang, Matthew A. Gave, David P. Weliky and Mercuri G. Kanatzidis\*

The  $\text{Cs}^+$  salts of novel molecular anions  $[\text{P}_5\text{Se}_{12}]^{5-}$  and  $[\text{P}_6\text{Se}_{12}]^{4-}$  are described.  $[\text{P}_5\text{Se}_{12}]^{5-}$  has a  $\text{P}^{3+}$  center with octahedral coordination and its non-centrosymmetric salt exhibits SHG response. Both compounds are crystal-glass phase change materials.

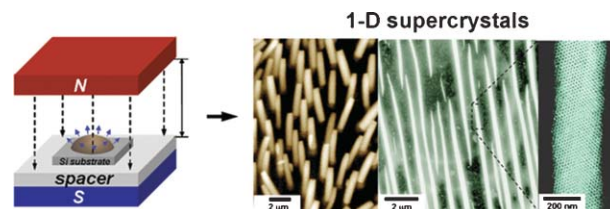


5001

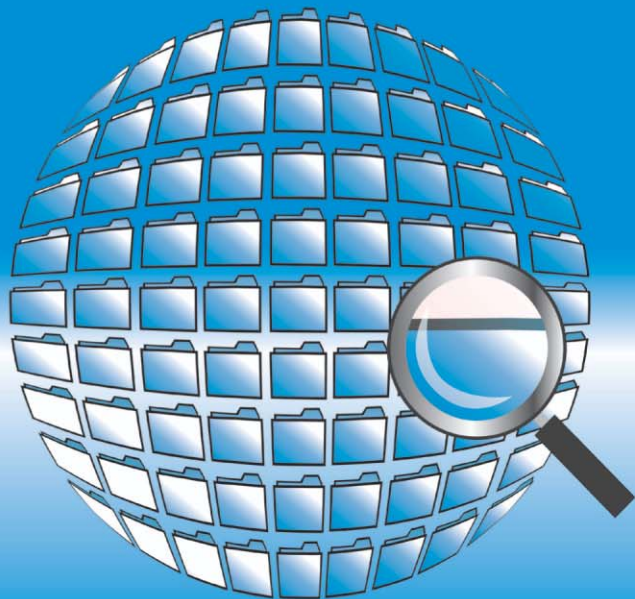
### Highly crystalline anisotropic superstructures via magnetic field induced nanoparticle assembly

Jong-Il Park, Young-wook Jun, Jin-sil Choi and Jinwoo Cheon\*

A magnetic field is successfully utilized to induce the fabrication of size controllable one-dimensional (1-D) supercrystals which are composed of a highly crystalline assembly of fcc-packed cobalt nanoparticles; the anisotropy associated supercrystal magnetism is enhanced with four times higher coercivity than that of randomly aggregated nanoparticles.



# RSC Database and Current Awareness Products



- Abstracted from high quality sources
- Easy to use search functions
- Clearly displayed results
- Spanning the chemical sciences

for quick and easy searching

## Graphical Databases

present search results in both text and graphical form. Titles include *Catalysts & Catalysed Reactions*, *Methods in Organic Synthesis* and *Natural Product Updates*.

## Specialist Databases

review both academic and industrial literature on a wide range of hard to reach and unique information. Titles include *Chemical Hazards in Industry* and *Laboratory Hazards Bulletin*.

## Analytical Abstracts

is the first stop for analytical scientists. Offering coverage on all areas of analytical and bioanalytical science. With a fresh new look, including improved search and results features, *Analytical Abstracts* offers an excellent online service.

Find out more at

RSC Publishing

[www.rsc.org/databases](http://www.rsc.org/databases)

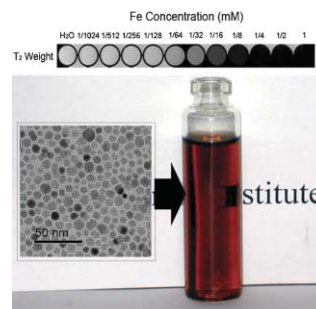
Registered Charity Number 207890

5004

### Monodisperse water-soluble magnetite nanoparticles prepared by polyol process for high-performance magnetic resonance imaging

Jiaqi Wan, Wei Cai,\* Xiangxi Meng and Enzhong Liu

Monodisperse water-soluble magnetite nanoparticles which have great potential as high-performance MRI contrast agents for cell or molecular imaging have been prepared *via* high temperature decomposition of an iron precursor in liquid polyols.

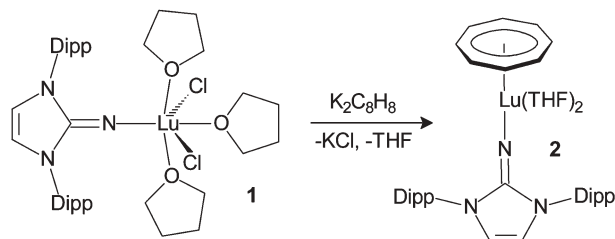


5007

### Syntheses and structures of mononuclear lutetium imido complexes with very short Lu–N bonds

Tarun K. Panda, Sören Randoll, Cristian G. Hrib, Peter G. Jones, Thomas Bannenberg and Matthias Tamm\*

The imidazolin-2-iminato lutetium complexes **1** and **2** with terminal imido ligands feature the shortest Lu–N bonds on record, raising the question of lanthanide–nitrogen multiple bonding.

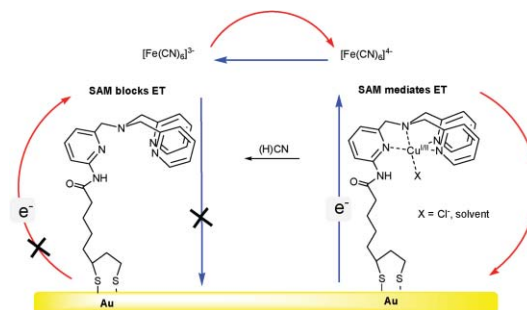


5010

### Effective anion sensing based on the ability of copper to affect electron transport across self-assembled monolayers

V. Ganesh, Maria Pilar Calatayud Sanz and Juan C. Mareque-Rivas\*

The ability of copper ions to affect the charge-transfer resistance of self-assembled monolayers (SAMs) of a tris-(2-pyridylmethyl)amine-based ligand on to gold electrodes is used to create a novel, sensitive and selective electrochemical cyanide sensor.

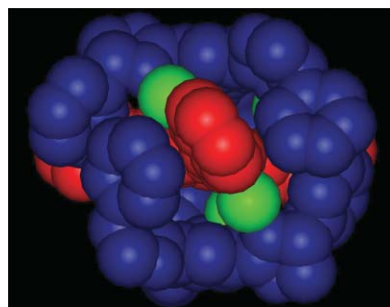


5013

### A hamburger-shaped helical stacking of disk-shaped ligands mediated by silver(II) ions

Ho Yong Lee, Jaejoon Park, Myoung Soo Lah and Jong-In Hong\*

We describe a hamburger-shaped helical structure of chiral and achiral  $C_3$ -symmetric disk-shaped ligands mediated by silver ions.



“ [Project Prospect] is an exciting application of ontologies that will help researchers.”

Midori Harris  
*European Bioinformatics Institute*

“ Invaluable for students.”

Stephen Haswell  
*University of Hull, UK*

“ This is terrific! ”

Brian Shoichet  
*University of California, San Francisco and  
Molecular BioSystems' Board member*

“ ...a fantastic resource for the community and a great use of the Gene Ontology and Sequence Ontology.”

Chris Mungall  
*Lawrence Berkeley National Laboratory*

**Features include**

*Ontology terms linked to definitions and related papers*

*RSS feeds with ontology terms and compound structures*

*Hyperlinked compound information in text*

*IUPAC Gold Book terms linked*

**Benefits**

*Ideal for students*

*Completely free service*

*At a glance HTML view with additional features accessed by toolbox*

*Downloadable compound structures*

*Printer friendly*

**...with *Molecular BioSystems* and RSC Project Prospect**

A revolutionary change in the way chemical and molecular biology articles are published is underway - thanks to RSC Project Prospect, an initiative developed by RSC Publishing together with academic partners. Not only can *Molecular BioSystems* readers click on named compounds in a journal article to download structures, more importantly they can link to definitions of ontology terms plus related papers. Powerful functionality instantly helps researchers and their students to find, understand and share (bio)chemical knowledge with each other quicker than ever before. See the science in *Molecular BioSystems* (and other RSC journals) come alive: visit the RSC Project Prospect website for more details plus examples.

**RSC Publishing**

**[www.projectprospect.org](http://www.projectprospect.org)**

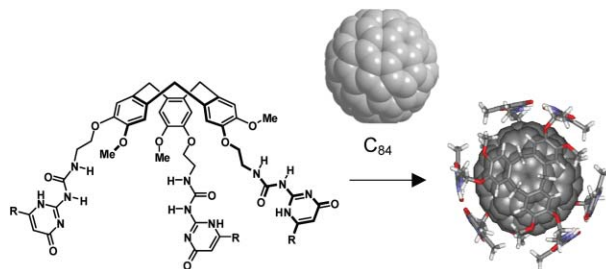
Registered Charity Number 207890

5016

### Preferential separation of fullerene[84] from fullerene mixtures by encapsulation

Elisa Huerta, Enrique Cequier and Javier de Mendoza\*

The encapsulation of fullerenes with a cyclotrimeratrylene derivative, capable to self-assemble into a dimer by means of three strong quadruple hydrogen bonding scaffolds allows an easy enrichment of C<sub>84</sub> directly from fullerene mixtures.

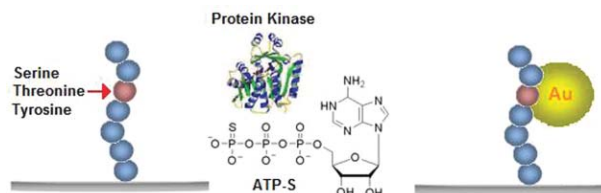


5019

### Electrochemical detection of kinase-catalyzed thiophosphorylation using gold nanoparticles

Kagan Kerman and Heinz-Bernhard Kraatz\*

An electrochemical biosensor for kinase-catalyzed reactions is coupled with the thiophosphorylation of the substrate peptide using adenosine 5'-[γ-thio] triphosphate (ATP-S) as the co-substrate.

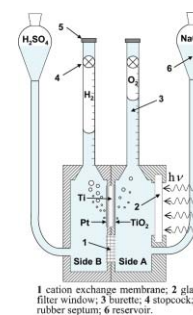


5022

### A photocatalytic water splitting device for separate hydrogen and oxygen evolution

Elena Selli,\* Gian Luca Chiarello, Eliana Quartarone, Piercarlo Mustarelli, Ilenia Rossetti and Lucio Forni

Separate hydrogen and oxygen production from photocatalytic water splitting was achieved in a two-compartment Plexiglas cell, on a thin TiO<sub>2</sub> layer deposited by magnetron sputtering on a Ti electrode.



5025

### A diastereoselective carbocyclisation of allene-hydrazones through the intramolecular allylic transfer reaction

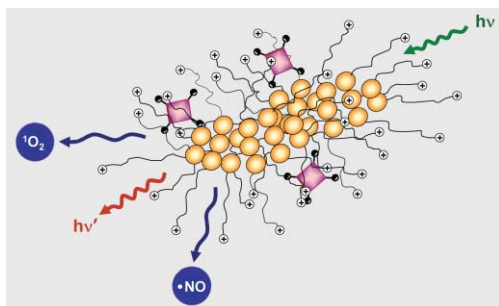
Sang-Hoon Kim, Seung-Ju Oh, Yurim Kim and Chan-Mo Yu\*

A highly diastereoselective synthesis of cyclic hydrazines was achieved from the carbocyclisation of allene-hydrazones by the Pd-catalyzed distannylation of an allene moiety, followed by the transmetalation of allylic stannane intermediates with TiCl<sub>4</sub>.



Reagents and conditions: i. Me<sub>3</sub>SnSnMe<sub>3</sub>, (π-allyl)<sub>2</sub>PdCl<sub>2</sub> (3 mol%), -40 °C, 3 h, CH<sub>2</sub>Cl<sub>2</sub> ii. TiCl<sub>4</sub>, -78 °C, 2 h

5028

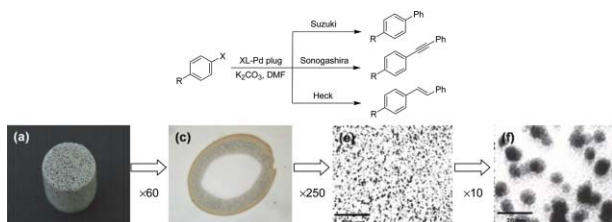


### A multifunctional nanoassembly of mesogen-bearing amphiphiles and porphyrins for the simultaneous photodelivery of nitric oxide and singlet oxygen

Elisa B. Caruso, Enzo Cicciarella and Salvatore Sortino\*

The first example is shown of a molecular nanoassembly able to supply simultaneously, in the same region of space and under the exclusive control of visible light, nitric oxide and singlet oxygen, two species playing a key role in the therapy of cancer.

5031

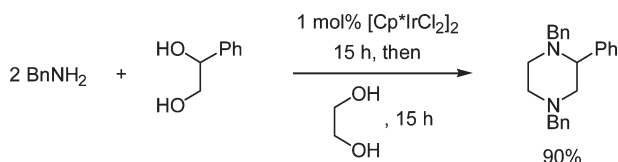


### Entangled palladium nanoparticles in resin plugs

Romain Najman, Jin Ku Cho, Andrew F. Coffey, John W. Davies and Mark Bradley\*

Palladium nanoparticles were entrapped within resin plugs and used in a range of ligand-free cross-coupling reactions, easily recovered and multiply reused.

5034

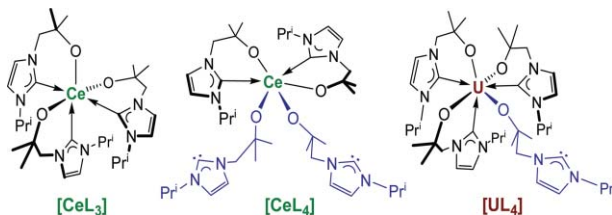


### Iridium catalysed synthesis of piperazines from diols

Lars Ulrik Nordstrøm and Robert Madsen\*

Piperazines are prepared by cyclocondensation of diols with either a primary amine or a 1,2-diamine in aqueous media in the presence of a catalytic amount of  $[\text{Cp}^*\text{IrCl}_2]_2$ .

5037



### Tetravalent cerium carbene complexes

Ian J. Casely, Stephen T. Liddle, Alexander J. Blake, Claire Wilson and Polly L. Arnold\*

The tetravalent organometallic cerium complex  $[\text{CeL}_4]$  is readily accessible from the oxidation of the trivalent  $[\text{CeL}_3]$ . The  $[\text{CeL}_4]$  and  $[\text{UL}_4]$  analogue show significantly different structures, highlighting the differences between 4f and 5f metals.

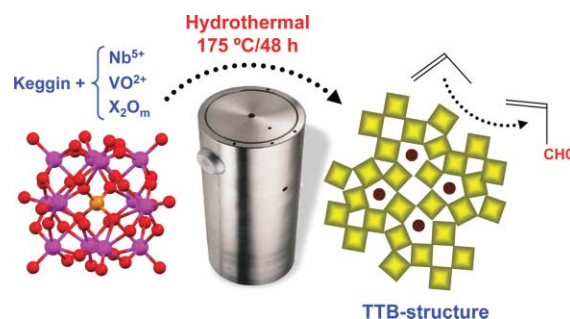


5040

### The hydrothermal synthesis of tetragonal tungsten bronze-based catalysts for the selective oxidation of hydrocarbons

Pablo Botella, Benjamín Solsona, Ester García-González, José M. González-Calbet and José M. López Nieto\*

Mixed metal oxides with tetragonal tungsten bronze (TTB) structure, showing high activity and selectivity for the gas phase partial oxidation of olefins, have been prepared by hydrothermal synthesis from Keggin-type heteropolyacids.

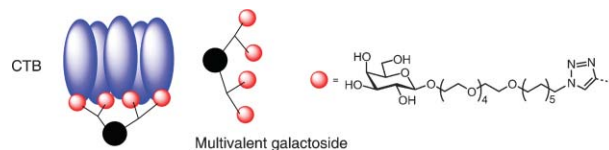


5043

### Strong inhibition of cholera toxin binding by galactose dendrimers

Hilbert M. Branderhorst, Rob M. J. Liskamp, Gerben M. Visser and Roland J. Pieters\*

Glycodendrimers derived from cheap galactose inhibit cholera toxin binding with such potency that they can compete with the natural complex pentasaccharide ligand.

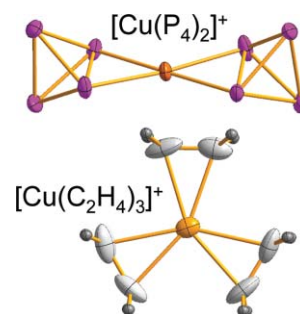


5046

### Homoleptic Cu–phosphorus and Cu–ethene complexes

Gustavo Santiso-Quiñones,\* Andreas Reisinger, John Slattery and Ingo Krossing\*

Stable salts of the first homoleptic Cu–phosphorus and Cu–ethene complexes, isolated by the aid of the weakly coordinating anion (WCA) [Al(OC(CF<sub>3</sub>)<sub>3</sub>)<sub>4</sub>]<sup>−</sup>, were obtained by the reaction of a three-fold excess of CuI and Ag(WCA) in the presence of the ligand.

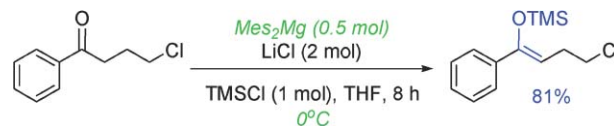


5049

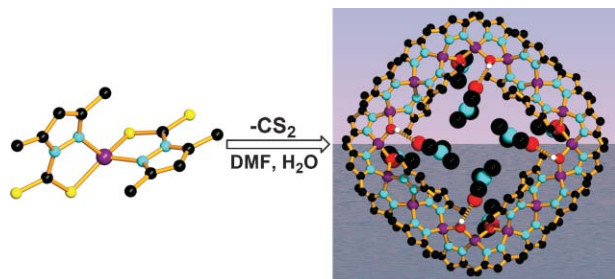
### Bismesitylmagnesium: a thermally stable and non-nucleophilic carbon-centred base reagent for the efficient preparation of silyl enol ethers

William J. Kerr,\* Allan J. B. Watson and Douglas Hayes

Bismesitylmagnesium has been established as a practical non-nucleophilic carbon-centred base reagent for access to silyl enol ethers from ketone substrates at readily utilisable temperatures without the requirement for any amine species.



5052

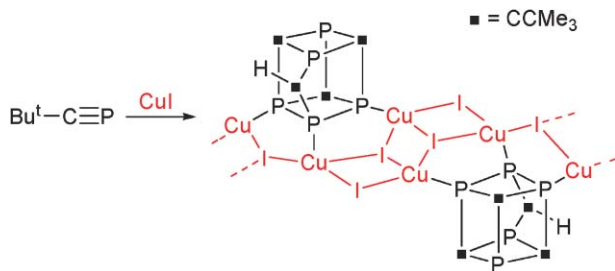


**Unique formation of two high-nuclearity metallamacrocycles from a mononuclear complex [Zn(dmpzdtc)<sub>2</sub>] (dmpzdtc = 3,5-dimethylpyrazole-1-dithiocarboxylate) via CS<sub>2</sub> elimination**

Hong-Xi Li, Hua-Zhou Wu, Wen-Hua Zhang, Zhi-Gang Ren, Yong Zhang and Jian-Ping Lang\*

Complete CS<sub>2</sub> elimination from a mononuclear complex [Zn(dmpzdtc)<sub>2</sub>] in solvents saturated with water led to the formation of two high-nuclearity complexes [Zn<sub>4</sub>(μ-dmpz)<sub>6</sub>(μ-OH)<sub>2</sub>]<sub>2</sub> and [Zn<sub>4</sub>(μ-dmpz)<sub>6</sub>(μ-OH)<sub>2</sub>]<sub>4</sub>.

5055

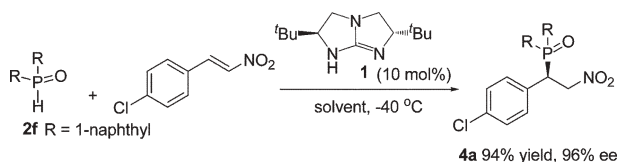


**Copper(I) mediated oligomerisation of a phosphalkyne**

Ulf Vogel, John F. Nixon and Manfred Scheer\*

The oligomerisation of *tert*-butylphosphalkyne mediated by CuI yields an unprecedented C<sub>4</sub>P<sub>5</sub>-cage embedded in a CuI matrix, which can be removed with aqueous NaCN to yield the free cage compound along with rearrangement products.

5058

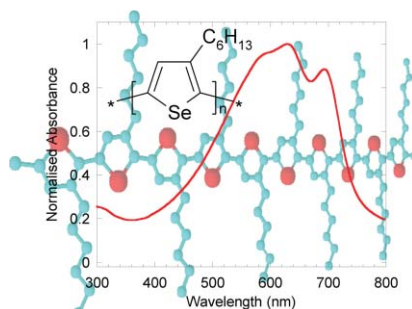


**Bicyclic guanidine-catalyzed enantioselective phospho-Michael reaction: synthesis of chiral β-aminophosphine oxides and β-aminophosphines**

Xiao Fu, Zhiyong Jiang and Choon-Hong Tan\*

A chiral bicyclic guanidine has been found to catalyze the phospho-Michael reactions of diaryl phosphine oxide to nitroalkenes with high enantioselectivities, offering a direct methodology to prepare chiral β-aminophosphine oxides and β-aminophosphines.

5061



**Regioregular poly(3-hexyl)selenophene: a low band gap organic hole transporting polymer**

Martin Heeney,\* Weimin Zhang, David J. Crouch, Michael L. Chabinye, Sergey Gordeyev, Rick Hamilton, Simon J. Higgins, Iain McCulloch, Peter J. Skabara, David Sparrowe and Steve Tierney

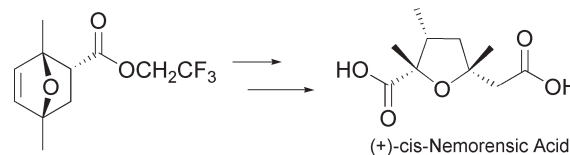
The first synthesis of regioregular poly(3-hexylselenophene) (P3HS) is reported, and its properties are compared to those of regioregular poly(3-hexylthiophene). P3HS is a promising photovoltaic donor material, exhibiting high crystallinity, high charge carrier mobility and an optical band gap of 1.6 eV.

5064

### Asymmetric synthesis of (+)-*cis*-nemorensic acid from a chiral Diels–Alder adduct of 2,5-dimethylfuran

Jae Yi Sim, Geum-Sook Hwang, Kyung Hwa Kim, Eun Mi Ko and Do Hyun Ryu\*

(+)-*cis*-Nemorensic acid was synthesized from a chiral Diels–Alder adduct prepared by a catalytic enantioselective Diels–Alder reaction with 2,5-dimethylfuran and 2,2,2-trifluoroethyl acrylate.

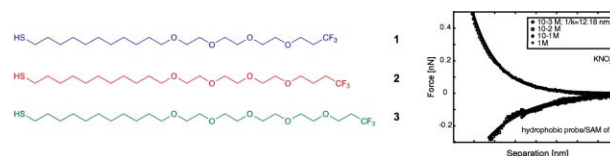


5066

### Ionic strength mediated hydrophobic force switching of CF<sub>3</sub>-terminated ethylene glycol self-assembled monolayers (SAMs) on gold

Nelly Bonnet, David O'Hagan\* and Georg Hähner\*

Novel oligo (ethylene glycol) CF<sub>3</sub>-terminated switching self-assembled monolayers allow the force experienced by a hydrophobic object to be controlled *via* the ionic strength of the environment.

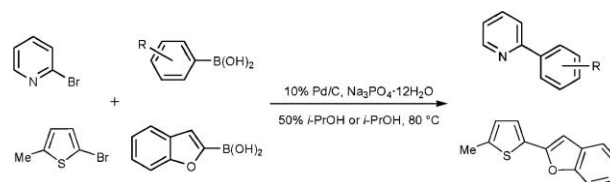


5069

### Ligand-free Pd/C-catalyzed Suzuki–Miyaura coupling reaction for the synthesis of heterobiaryl derivatives

Yoshiaki Kitamura, Satoko Sako, Takahiro Udzu, Azusa Tsutsui, Tomohiro Maegawa, Yasunari Monguchi and Hironao Sajiki\*

A mild and efficient protocol for the ligand-free and heterogeneous Pd/C-catalyzed hetero Suzuki–Miyaura coupling reaction is described. This method is compatible with a wide range of heteroaryl substrates.

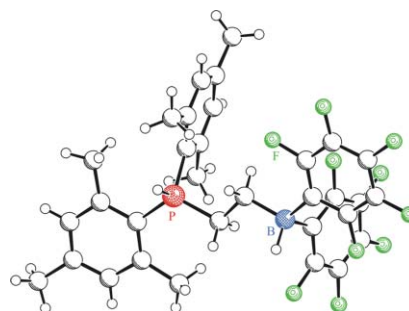


5072

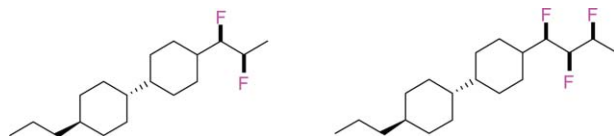
### Rapid intramolecular heterolytic dihydrogen activation by a four-membered heterocyclic phosphane–borane adduct

Patrick Spies, Gerhard Erker,\* Gerald Kehr, Klaus Bergander, Roland Fröhlich, Stefan Grimme and Douglas W. Stephan

Dihydrogen adds rapidly to a four-membered internal phosphane–borane adduct to yield the ethylene-bridged phosphonium–hydridoborate zwitterion, which stoichiometrically reduces benzaldehyde.



5075

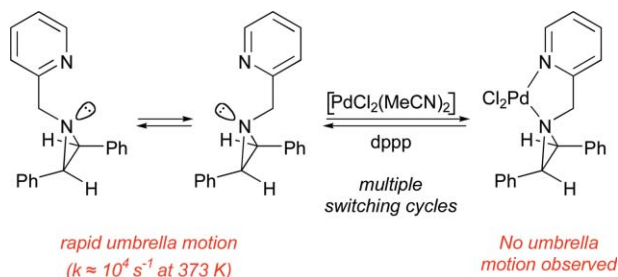


### Liquid crystals carrying stereodefined vicinal difluoro- and trifluoro- alkyl motifs

Marcello Nicoletti, Matthias Bremer, Peer Kirsch\* and David O'Hagan\*

Two novel materials are prepared carrying two or three vicinal fluorines and both display negative dielectric anisotropy ( $\Delta\epsilon$ ). The conformation of the fluorinated alkyl chains is examined in relation to the magnitude of  $\Delta\epsilon$ .

5078

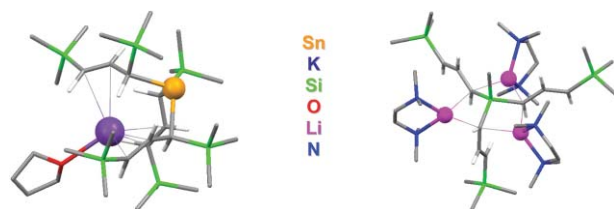


### Umbrella motion in aziridines: use of simple chemical inputs to reversibly control the rate of pyramidal inversion

Mark W. Davies, Adam J. Clarke, Guy J. Clarkson, Michael Shipman\* and James H. R. Tucker\*

The molecular motion associated with atomic inversion at an aziridine nitrogen can be repeatedly switched “off” and “on” using simple chemical inputs.

5081

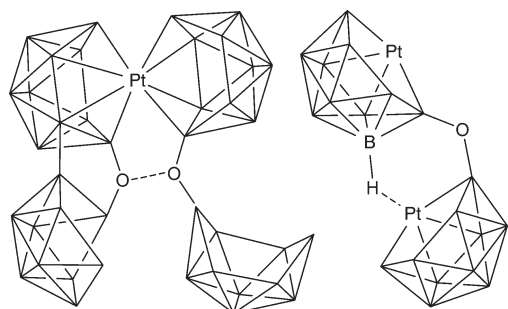


### Ansa-tris(allyl) complexes of alkali metals: tripodal analogues of cyclopentadienyl and ansa-metalloocene ligands

Richard A. Layfield,\* Felipe García, Julien Hannauer and Simon M. Humphrey

Alkali metal complexes of *ansa*-tris(allyl) ligands are reported. The isoelectronic relationship between these podand-like ligands and the cyclopentadienyl and *ansa*-metalloocene ligands is discussed.

5084



### Macropolyhedral boron-containing cluster chemistry. Novel intercluster linkages from the reaction of [Pt(cod)Cl<sub>2</sub>] and [PtMe<sub>2</sub>(PMe<sub>2</sub>Ph)<sub>2</sub>] with 6,6'-(B<sub>10</sub>H<sub>13</sub>)<sub>2</sub>O

Jonathan Bould and John D. Kennedy\*

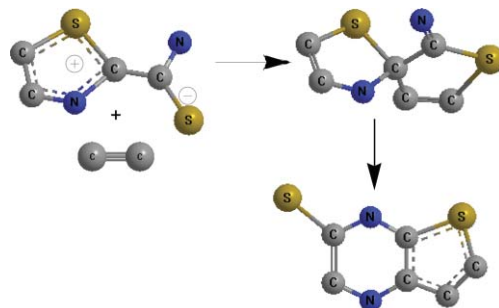
Neutral [(PMe<sub>2</sub>Ph)<sub>2</sub>PtB<sub>10</sub>H<sub>10</sub>-O,H-B<sub>10</sub>H<sub>11</sub>Pt(PMe<sub>2</sub>Ph)] and the [(B<sub>10</sub>H<sub>13</sub>OB<sub>10</sub>H<sub>11</sub>)Pt-(B<sub>10</sub>H<sub>10</sub>OB<sub>10</sub>H<sub>12</sub>)]<sup>2-</sup> dianion exhibit unusual inter-cluster connectivity modes that involve B-O-B linkages.

5087

**The unprecedented ring transformation from thiazoline-spiro-thiophene to thieno[2,3-*b*]pyrazine involved in the reaction of 2-thiocarbamoyl thiazolium salts with dimethyl acetylenedicarboxylate**

Yang Guang Ma and Ying Cheng\*

Reaction of 2-thiocarbamoyl thiazolium salts with dimethyl acetylenedicarboxylate proceeded *via* a tandem [3 + 2] cycloaddition and a unprecedented ring transformation to produce functionalized thieno[2,3-*b*]pyrazine derivatives in good to excellent yields.

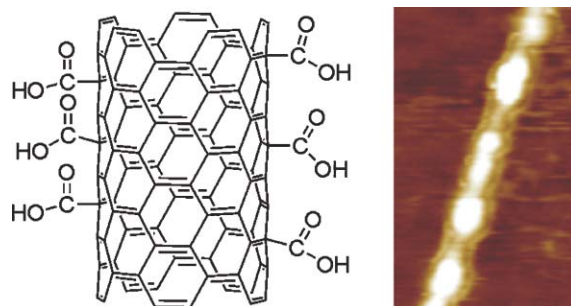


5090

**Removal of amorphous carbon for the efficient sidewall functionalisation of single-walled carbon nanotubes**

Lidong Shao, Gerard Tobias,\* Christoph G. Salzmann, Belén Ballesteros, Sung You Hong, Alison Crossley, Benjamin G. Davis and Malcolm L. H. Green

The sidewall functionalisation of carbon nanotubes using the standard nitric acid treatment can be greatly enhanced by first removing the amorphous carbon present in the sample.

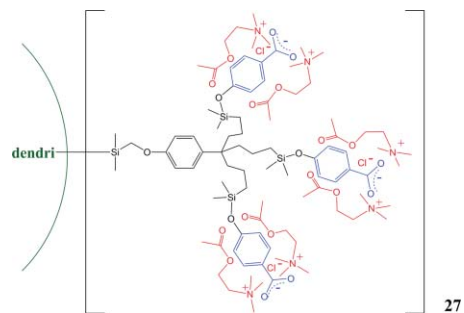


5093

**New water-soluble polyanionic dendrimers and binding to acetylcholine in water by means of contact ion-pairing interactions**

Cátia Ornelas, Elodie Boisselier, Victor Martinez, Isabelle Pianet, Jaime Ruiz Aranzaes and Didier Astruc\*

A new dendrimer containing 81 benzoate termini binds acetylcholine in water by contact ion-pairing and encapsulation as indicated by  $^1\text{H}$  NMR spectroscopy, including DOSY experiments which show that its diameter ( $11 \pm 1$  nm) does not increase upon acetylcholine binding.

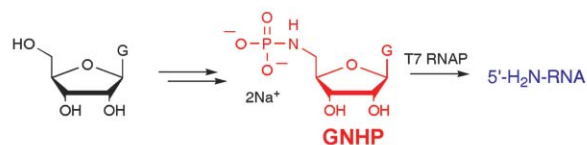


5096

**Synthesis of 5'-amino-5'-deoxyguanosine-5'-*N*-phosphoramidate and its enzymatic incorporation at the 5'-termini of RNA molecules**

David Williamson, Martin J. Cann and David R. W. Hodgson\*

5'-Amino-5'-deoxyguanosine-5'-*N*-phosphoramidate (GNHP) was synthesised in four steps from guanosine. GNHP was found to initiate T7 RNAP-promoted transcriptions to afford 5'-GNHP-RNA which hydrolyzes readily to yield 5'-H<sub>2</sub>N-RNA that can be conjugated to activated esters.




## AUTHOR INDEX

- Ando, Tomomi, 4995  
 Arnold, Polly L., 5037  
 Astruc, Didier, 5093  
 Ballesteros, Belén, 5090  
 Bannenberg, Thomas, 5007  
 Barth, Rolf F., 4978  
 Bergander, Klaus, 5072  
 Blake, Alexander J., 5037  
 Boisselier, Elodie, 5093  
 Bonnet, Nelly, 5066  
 Botella, Pablo, 5040  
 Bould, Jonathan, 5084  
 Bradley, Mark, 5031  
 Branderhorst, Hilbert M., 5043  
 Bremer, Matthias, 5075  
 Byun, Youngjoo, 4978  
 Cai, Wei, 5004  
 Calatayud Sanz, Maria Pilar, 5010  
 Cann, Martin J., 5096  
 Caruso, Elisa B., 5028  
 Casely, Ian J., 5037  
 Cequier, Enrique, 5016  
 Chabiny, Michael L., 5061  
 Cheng, Ying, 5087  
 Cheon, Jinwoo, 5001  
 Chiarello, Gian Luca, 5022  
 Cho, Jin Ku, 5031  
 Choi, Jin-sil, 5001  
 Chung, In, 4998  
 Ciccirella, Enzo, 5028  
 Clarke, Adam J., 5078  
 Clarkson, Guy J., 5078  
 Coffey, Andrew F., 5031  
 Crossley, Alison, 5090  
 Crouch, David J., 5061  
 Davies, John W., 5031  
 Davies, Mark W., 5078  
 Davis, Benjamin G., 5090  
 de Mendoza, Javier, 5016  
 Erker, Gerhard, 5072  
 Forni, Lucio, 5022  
 Fröhlich, Roland, 5072  
 Fu, Xiao, 5058  
 Ganesh, V., 5010  
 García, Felipe, 5081  
 García-González, Ester, 5040  
 Gave, Matthew A., 4998  
 González-Calbet, José M., 5040  
 Gordeyev, Sergey, 5061  
 Grabow, Wade, 4992  
 Green, Malcolm L. H., 5090  
 Grimme, Stefan, 5072  
 Hähner, Georg, 5066  
 Hamilton, Rick, 5061  
 Hannauer, Julien, 5081  
 Hayes, Douglas, 5049  
 Heeney, Martin, 5061  
 Higgins, Simon J., 5061  
 Hodgson, David R. W., 5096  
 Hong, Jong-In, 5013  
 Hong, Sung You, 5090  
 Hrib, Cristian G., 5007  
 Huerta, Elisa, 5016  
 Humphrey, Simon M., 5081  
 Hwang, Geum-Sook, 5064  
 Iacono, Scott T., 4992  
 Jang, Joon I., 4998  
 Jiang, Zhiyong, 5058  
 Jones, Peter G., 5007  
 Jun, Young-wook, 5001  
 Kanatzidis, Mercouri G., 4998  
 Kehr, Gerald, 5072  
 Kennedy, John D., 5084  
 Kerman, Kagan, 5019  
 Kerr, William J., 5049  
 Kim, Kyung Hwa, 5064  
 Kim, Sang-Hoon, 5025  
 Kim, Yurim, 5025  
 Kirsch, Peer, 5075  
 Kitamura, Yoshiaki, 5069  
 Ko, Eun Mi, 5064  
 Kraatz, Heinz-Bernhard, 5019  
 Krossing, Ingo, 5046  
 Lah, Myoung Soo, 5013  
 Lang, Jian-Ping, 5052  
 Layfield, Richard A., 5081  
 Lee, Ho Yong, 5013  
 Li, Hong-Xi, 5052  
 Liddle, Stephen T., 5037  
 Liskamp, Rob M. J., 5043  
 Liu, Enzhong, 5004  
 López Nieto, José M., 5040  
 Ma, Yang Guang, 5087  
 Mabry, Joseph M., 4992  
 Madsen, Robert, 5034  
 Maegawa, Tomohiro, 5069  
 Mareque-Rivas, Juan C., 5010  
 Martínez, Victor, 5093  
 McCulloch, Iain, 5061  
 Meng, Xiangxi, 5004  
 Monguchi, Yasunari, 5069  
 Mustarelli, Piercarlo, 5022  
 Nagamune, Teruyuki, 4995  
 Najman, Romain, 5031  
 Narayanasamy, Sureshbabu, 4978  
 Nicoletti, Marcello, 5075  
 Nixon, John F., 5055  
 Nordström, Lars Ulrik, 5034  
 Oh, Seung-Ju, 5025  
 O'Hagan, David, 5066, 5075  
 Ornelas, Cátia, 5093  
 Panda, Tarun K., 5007  
 Park, Jaejoon, 5013  
 Park, Jong-Il, 5001  
 Pianet, Isabelle, 5093  
 Pieters, Roland J., 5043  
 Quartarone, Eliana, 5022  
 Randoll, Sören, 5007  
 Reisinger, Andreas, 5046  
 Ren, Zhi-Gang, 5052  
 Rossetti, Ilenia, 5022  
 Ruiz Aranzaes, Jaime, 5093  
 Ryu, Do Hyun, 5064  
 Sajiki, Hironao, 5069  
 Sako, Satoko, 5069  
 Salzmann, Christoph G., 5090  
 Santiso-Quñones, Gustavo, 5046  
 Scheer, Manfred, 5055  
 Selli, Elena, 5022  
 Shao, Lidong, 5090  
 Shipman, Michael, 5078  
 Sim, Jae Yi, 5064  
 Skabara, Peter J., 5061  
 Slattery, John, 5046  
 Smith, Jr., Dennis W., 4992  
 Solsona, Benjamin, 5040  
 Sortino, Salvatore, 5028  
 Sparrowe, David, 5061  
 Spies, Patrick, 5072  
 Stephan, Douglas W., 5072  
 Tamm, Matthias, 5007  
 Tan, Choon-Hong, 5058  
 Tanaka, Tsutomu, 4995  
 Tiarney, Steve, 5061  
 Tiwari, Rohit, 4978  
 Tjarks, Werner, 4978  
 Tobias, Gerard, 5090  
 Tsukiji, Shinya, 4995  
 Tsutsui, Azusa, 5069  
 Tucker, James H. R., 5078  
 Udzu, Takahiro, 5069  
 Viji, Ashwani, 4992  
 Visser, Gerben M., 5043  
 Vogel, Ulf, 5055  
 Wan, Jiaqi, 5004  
 Watson, Allan J. B., 5049  
 Weliky, David P., 4998  
 Williamson, David, 5096  
 Wilson, Claire, 5037  
 Wu, Hua-Zhou, 5052  
 Yu, Chan-Mo, 5025  
 Zhang, Weimin, 5061  
 Zhang, Wen-Hua, 5052  
 Zhang, Yong, 5052

## FREE E-MAIL ALERTS AND RSS FEEDS


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

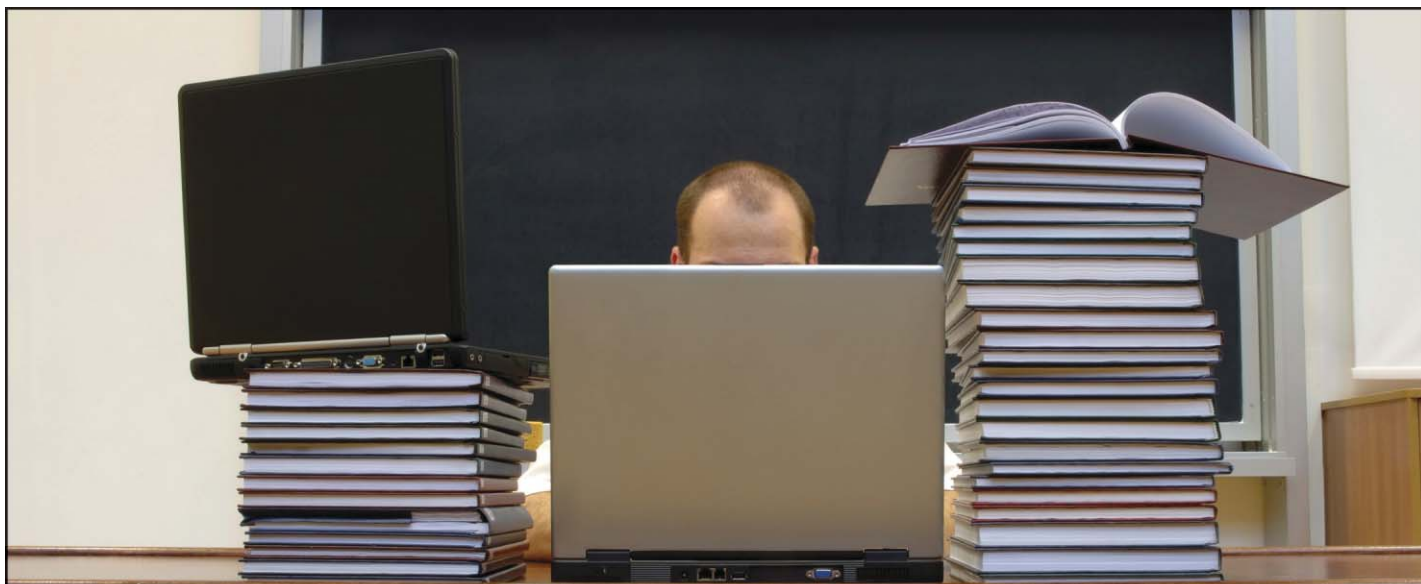
 Try our RSS feeds for up-to-the-minute news of the latest research. By setting up RSS feeds, preferably using feed reader software, you can be alerted to the latest Advance Articles published on the RSC web site. Visit [www.rsc.org/publishing/technology/rss.asp](http://www.rsc.org/publishing/technology/rss.asp) for details.

## 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](http://www.rsc.org/ejs) for more information.

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

 Electronic supplementary information (ESI) is available *via* the online article (see <http://www.rsc.org/esi> for general information about ESI).



## There is an easier way to keep up with research in your field...

An integral part of managing your career as a scientist is staying on top of the news and developments in your field of research and related areas. A good knowledge of your industry is a key component to your success, but finding the time to keep up with the latest research news can pose the greatest challenge.

**The solution?** By signing up for e-alerts from one of our free news services, you can receive updates about newsworthy and significant research appearing in RSC journals in a quick and easily digestible monthly alert.

**Free access.** From each news item you can link directly to the source research paper, which is completely free to access and download for a limited period.

**New tools to help you.** In addition to research news, our news services also feature

- **Instant insights** – whirlwind tours of exciting research areas you should know about
- **Interviews** – leading scientists share their opinions

**Chemical  
Technology**

[www.rsc.org/chemicaltechnology](http://www.rsc.org/chemicaltechnology)

**Chemical  
Science**

[www.rsc.org/chemicalscience](http://www.rsc.org/chemicalscience)

**Chemical  
Biology**

[www.rsc.org/chembiology](http://www.rsc.org/chembiology)

10110633

RSC Publishing

[www.rsc.org/ej\\_alert](http://www.rsc.org/ej_alert)

Registered Charity Number 207890