

ChemComm

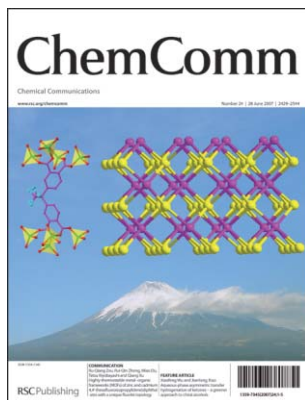
Chemical Communications

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

IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS (24) 2429–2544 (2007)



Cover

See Qiang Xu *et al.*, page 2467. The image shows the structure of the unique synthetic metal-organic framework material replicating the topology of fluorite, a crude mineral. Image reproduced by permission of Ru-Qiang Zou, Rui-Qin Zhong, Miao Du, Tetsu Kiyobayashi and Qiang Xu from *Chem. Commun.*, 2007, 2467.

ENERGY SUPPLEMENT

2445

Energy and the Chemical Sciences provides a 'snapshot' of the latest developments in energy and the environment from all RSC publications, showcasing newsworthy articles, upcoming theme issues, recent book titles and feature articles on this topic.

Energy and the Chemical Sciences

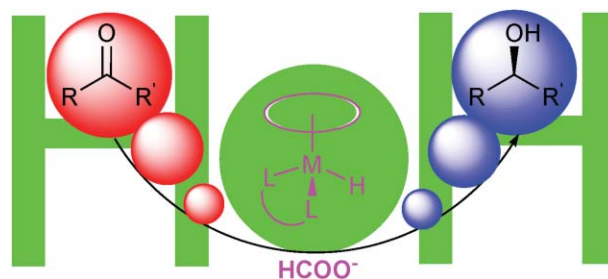
FEATURE ARTICLE

2449

Aqueous-phase asymmetric transfer hydrogenation of ketones – a greener approach to chiral alcohols

Xiaofeng Wu and Jianliang Xiao*

This article summarises the recent progress on transfer hydrogenation reactions in water, showing that various carbonyl compounds can be reduced in high speed, enantioselectivity and chemoselectivity with either off-the-shelf or tailor-made catalysts.



EDITORIAL STAFF

Editor

Sarah Thomas

Deputy editor

Kathryn Sear

Assistant editors

James Mitchell Crow, Nicola Nugent, Alison Stoddart, Katherine Vickers, Jenna Wilson

Publishing assistants

Jackie Cockrill, Jayne Gough, Rachel Hegarty

Team leader, serials production

Helen Saxton

Technical editors

Sue Askey, Celia Clarke, Nicola Convine, Alan Holder, Laura Howes, Sandra Jones, David Parker, Ken Wilkinson, Roger Young

Administration coordinator

Sonya Spring

Editorial secretaries

Donna Fordham, Jill Segev, 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

Nazario 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

EDITORIAL 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.

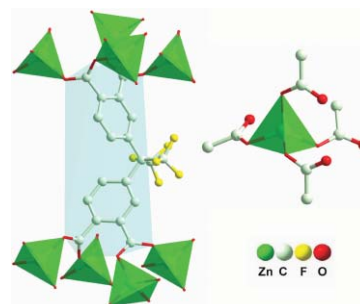
Authors may reproduce/republish portions of their published contribution without seeking permission from the RSC, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of The Royal Society of Chemistry.

2467

Highly-thermostable metal–organic frameworks (MOFs) of zinc and cadmium 4,4'-(hexafluoroisopropylidene)-diphthalates with a unique fluorite topology

Ru-Qiang Zou, Rui-Qin Zhong, Miao Du, Tetsu Kiyobayashi and Qiang Xu*

Two highly-thermostable metal–organic framework materials with a unique fluorite topology are presented.

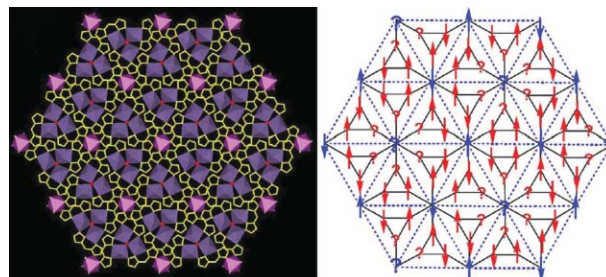


2470

Novel frustrated magnetic lattice based on triangular $[\text{Mn}_3(\mu_3\text{-F})]$ clusters with tetrazole ligands

En-Qing Gao,* Na Liu, Ai-Ling Cheng and Song Gao

Unprecedented $[\text{Mn}^{\text{II}}_3(\mu_3\text{-F})(\mu\text{-N-N})]$ triangular clusters with tetrazole ligands are linked by Mn^{II} ions to generate a novel spin-frustrated 2D lattice exhibiting antiferromagnetic ordering.

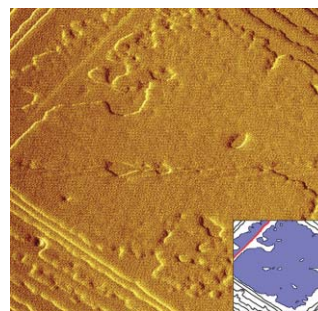


2473

Differentiating fundamental structural units during the dissolution of zeolite A

L. Itzel Meza,* Michael W. Anderson* and Jonathan R. Agger

The dissolution of the $\{100\}$ facets of zeolite A crystals in alkaline conditions occurs *via* a two-step process; uncorrelated dissolution of a single-four ring layer and step retreat of a sodalite-cage layer. The rates of dissolution have been successfully calculated for the first time by means of *in situ* atomic force microscopy examination.

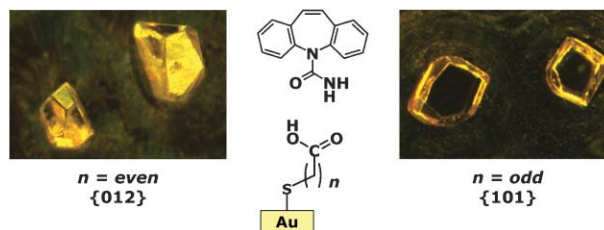


2476

Effect of alkyl chain parity on the face-selective crystal growth of a drug polymorph

Marta Dabros and Venkat R. Thalladi*

Carboxy terminated alkanethiol self-assembled monolayers promote the face-selective nucleation of the *P*-monoclinic polymorph of carbamazepine; the type of face nucleated depends on the parity of the alkyl chain. Coplanarity of the carboxy groups and amide dimers at the interface guides this selectivity.



Future Energy: Chemical Solutions

12 - 14 September 2007
University of Nottingham, UK

This unique three-day conference recognises the importance of the chemical sciences in the field of sustainable energy, a priority of the RSC.

The scientific programme is representative of the key energy areas, including sessions on energy materials, energy innovation and policy, fuel cells, nuclear waste management, carbon capture and storage, bio-energy and catalysts for energy.

Call for poster abstracts deadline - 13 July
Early booking deadline - 13 July

Invited speakers include:

- Steve Koonin (*BP plc*)
- Sir Richard Friend FRS (*Cambridge*)
- Peter Edwards FRS (*Oxford*)
- John Griffiths (*Leeds*)
- Keith Shine (*Reading*)
- Bernard Boullis (*CEA, France*)
- David Carslaw (*Leeds*)
- David Vincent (*Carbon Trust*)

Register now – see the website for full programme and registration information

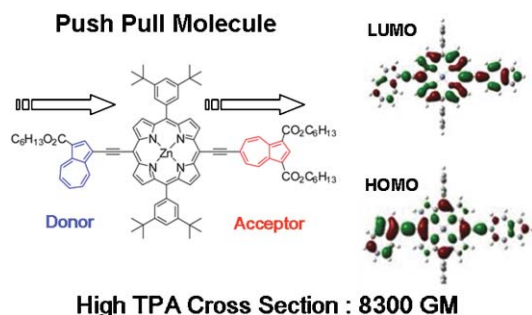


2479

Charge transfer induced enhancement of near-IR two-photon absorption of 5,15-bis(azulenylethynyl) zinc(II) porphyrins

Kil Suk Kim, Su Bum Noh, Takayuki Katsuda, Shuji Ito, Atsuhiko Osuka* and Dongho Kim*

Intramolecular charge transfer in 5,15-bis(azulenylethynyl) substituted zinc(II) porphyrin leads to a significant enhancement of two-photon absorption at near-IR region, which has been investigated by femtosecond Z-scan method.

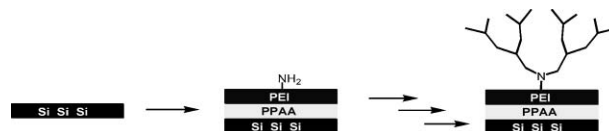


2482

Synthesis and characterization of immobilized PAMAM dendrons

Neal Pollock, Greg Fowler, Lance J. Twyman* and Sally L. McArthur*

The synthesis and characterization of dendrons immobilized onto a silicon surface functionalized with plasma polymerized acrylic acid and polyethyleneimine are described.

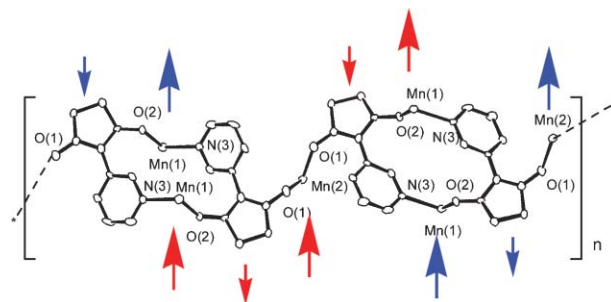


2485

Preparation, structure, and magnetic interaction of a Mn(hfac)₂-bridged [2-(3-pyridyl)(nitronyl nitroxide)-Mn(hfac)₂]₂ chain complex

Keiji Okada,* Shiori Beppu, Koichiro Tanaka, Masato Kuratsu, Kimiaki Furuichi, Masatoshi Kozaki, Shuichi Suzuki, Daisuke Shiomi,* Kazunobu Sato, Takeji Takui, Yasutaka Kitagawa and Kizashi Yamaguchi*

Red and blue spins align as shown at low temperatures in a new one-dimensional chain complex, [2-(3-pyridyl)(nitronyl nitroxide)]₂·[Mn(hfac)₂]₃.

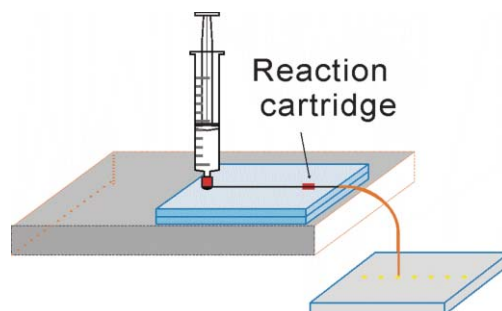


2488

Subfemtomole level protein sequencing by Edman degradation carried out in a microfluidic chip

Wenzhang Chen, Xuefeng Yin,* Jinxia Mu and Yan Yin

A microfluidic chip based Edman degradation system that employs a nanoliter-scale C18 column as a reaction cartridge.



RSC online shop

Simple, secure, fast!



24/7 access: The RSC online shop gives you continuous access to class leading products and services, expertly tailored to cater for your training and educational needs.

Browse and buy: Visit our shop to browse over 750 book titles, subscribe or purchase an individual article in one of our journals, join or renew your RSC membership, or register to attend a conference or training event.

Gift ideas: If you're looking for gift ideas, look no further. In our online shop you'll find everything from popular science books like *The Age of the Molecule* and the inspirational *Elegant Solutions* from award winning writer, Philip Ball, to our stunning Visual Elements wall chart and jigsaw.

With secure online payment you can shop online with confidence.

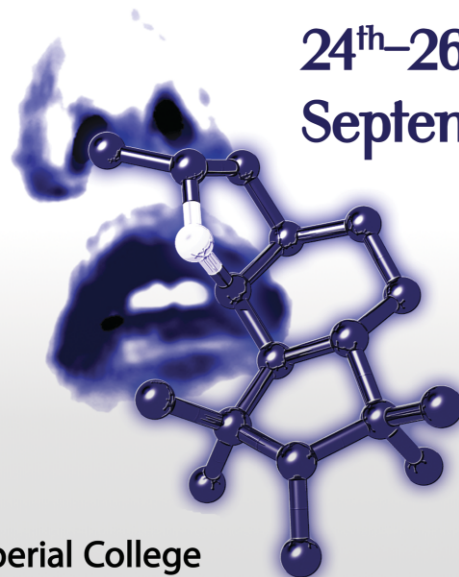
The RSC has so much to offer...
why not go online today?

19120654b

RSC Publishing www.rsc.org/shop

Registered Charity Number 207890

flavours & fragrances 2007 24th-26th September



Imperial College London

Following the successful format of the previous meetings, the programme of the 2007 RSC-SCI 'flavours & fragrances' conference, organised by Philip Kraft and Karl A. D. Swift, will include these confirmed speakers: Angela Bassoli (University Milano), Constanze Brocke (Symrise), Robin A. Clery (Quest), Johannes le Coutre (Nestlé), Elisabet Duñach (University Nice), Céline Ellena (Charabot), Mark Erman (Millennium), Charles Fehr (Firmenich), Felix Flachsmann (Givaudan), Helmut Hügel (RMIT Melbourne), Thomas Hummel (University Dresden), Daniel Joulain (Robertet), Philip Kraft (Givaudan), Dietmar Krautwurst (Dt. Inst. Ernährungsf.), Christophe Laudamiel (IFF), Hiroyuki Matsuda (Takasago), Frank Ott (Symrise), Johannes Panten (Symrise), Caroline Plessis (Mane), Peter Schieberle (TU Munich), Geza Schoen (Escentric Molecules), Charles S. Sell (Quest), Roger Snowden (Firmenich), Reinhold Tacke (University Würzburg) and Chris Winkel (Quest).

To obtain further informations and application forms, contact: Elaine Wellingham, Conference Secretariat, Field End House, Bude Close, Nailsea, Bristol BS48 2FQ, United Kingdom, Tel. and Fax +44 (0)1275 853311, e-mail: enquiries@confsec.co.uk
For information check: <http://www.confsec.co.uk>

RSC | Advancing the
Chemical Sciences

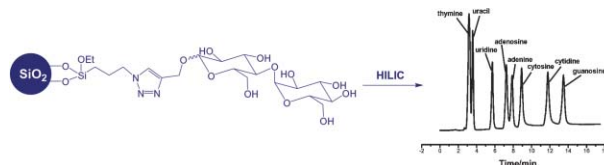
sci | where science
meets business

2491

“Click saccharides”: novel separation materials for hydrophilic interaction liquid chromatography

Zhimou Guo, Aiwen Lei,* Yongping Zhang, Qing Xu, Xingya Xue, Feifang Zhang and Xinmiao Liang*

Saccharides were covalently bonded onto silica beads *via* click chemistry and were employed as separation materials for HILIC, demonstrating excellent efficiency for separation of polar compounds.

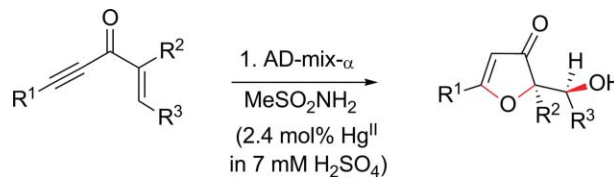


2494

A catalytic asymmetric protocol for the enantioselective synthesis of 3(2*H*)-furanones

Charles M. Marson,* Esra Edaan, James M. Morrell, Simon J. Coles, Michael B. Hursthouse and David T. Davies

A catalytic asymmetric protocol for the preparation of 3(2*H*)-furanones from enynones.

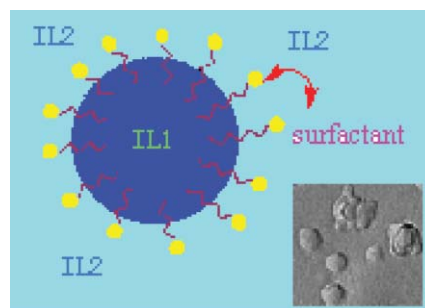


2497

Novel microemulsions: ionic liquid-in-ionic liquid

Siqing Cheng, Jianling Zhang, Zhaofu Zhang and Buxing Han*

The hydrophobic IL1 1-butyl-3-methylimidazolium hexafluorophosphate ([bmim][PF₆]) can be dispersed in hydrophilic IL2 propylammonium formate (PAF) with the aid of sodium bis(2-ethylhexyl) sulfosuccinate (AOT), and [bmim][PF₆]-in-PAF microemulsions are formed.

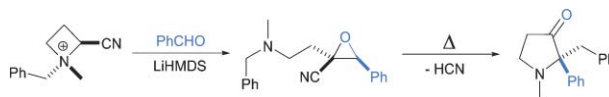


2500

Strained azetidinium ylides: new reagents for epoxidation

Audrey Alex, Bénédicte Larmanjat, Jérôme Marrot, François Couty and Olivier David*

Azetidinium ylides effected facile epoxidation of various carbonyl compounds furnishing tri- or tetrasubstituted epoxides that were unattainable *via* classical ammonium ylide chemistry; the produced trisubstituted oxiranes gave rise to a remarkable cascade of reactions leading to some original pyrrolidin-3-ones.



Society Publishing Superior Performance



ACS and RSC: Building the Future, one molecule at a time.

The American Chemical Society and Royal Society of Chemistry are not-for-profit society publishers. We support excellence in research and education by investing in our future generations of chemists.



ACS PUBLICATIONS
HIGH QUALITY. HIGH IMPACT.

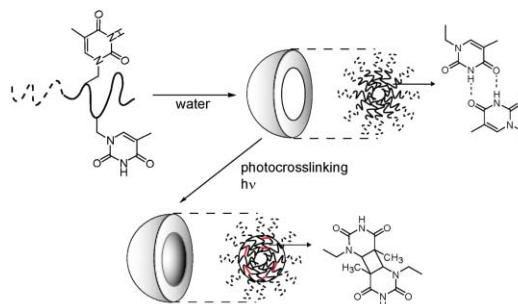
RSC Publishing

2503

Core-bound polymeric micellar system based on photocrosslinking of thymine

Kei Saito, Laura R. Ingalls, Jun Lee and John C. Warner*

Core-bound polymer micellar aggregates were synthesized by leveraging H-bonding and photocrosslinking properties of thymines.

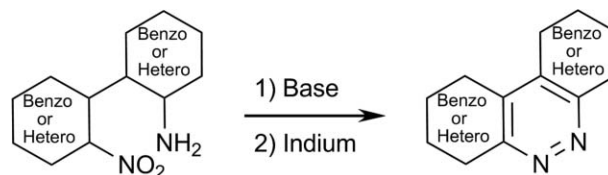


2506

A versatile synthesis of diverse 3,4-fused cinnolines via the base-catalysed condensation of 2-amino-2'-nitrobiaryls

Åsa Slevin, Tobias Koolmeister and Martin Scobie*

The base-catalysed cyclisation of 2-amino-2'-nitrobiaryls provides a flexible synthetic route into diverse tricyclic pyridazine-based systems.

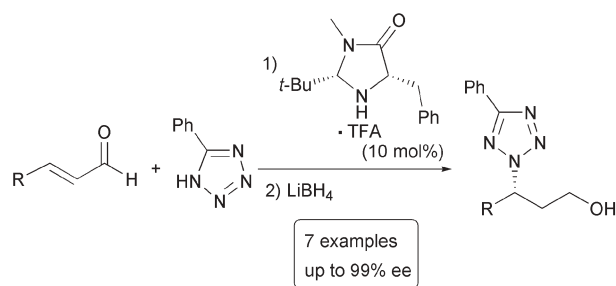


2509

Organocatalytic enantioselective aza-Michael reaction of nitrogen heterocycles and α,β -unsaturated aldehydes

Uxue Uribe, Jose L. Vicario,* Dolores Badía and Luisa Carrillo

The asymmetric organocatalytic aza-Michael reaction of several nitrogen heterocycles and α,β -unsaturated aldehydes has been studied. The conjugate addition products have been obtained in good yields as single regioisomers, and in high to excellent enantioselectivities.

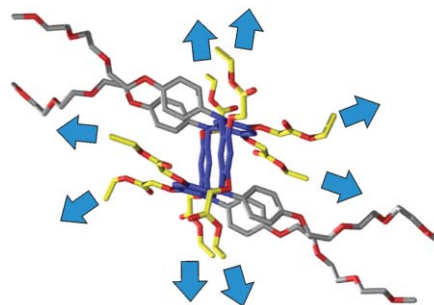


2512

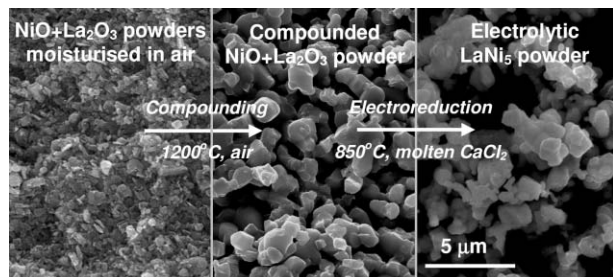
Novel octavalent cross-linker displays efficient trapping of protein-protein interactions

Simon R. Foster, Alice Pearce, Alexander J. Blake, Melanie J. Welham and James Dowden*

A novel octavalent, resorcin[4]arene derived, cross-linker designed to overcome some of the limitations of commercially available reagents is significantly more efficient for covalent stabilisation of protein-protein interactions.



2515

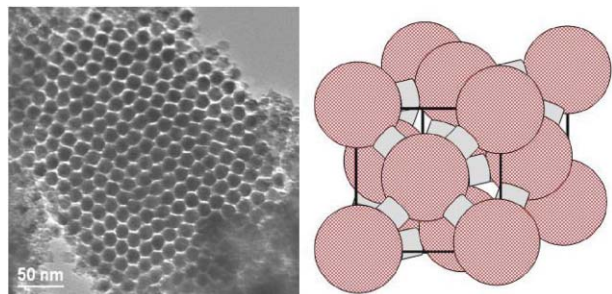


More affordable electrolytic LaNi₅-type hydrogen storage powders

Yong Zhu, Dihua Wang,* Meng Ma, Xiaohong Hu, Xianbo Jin and George Z. Chen*

Compounding La₂O₃ with NiO protects the former from water and molten salt attack, and enables electrolytic synthesis of high performance LaNi₅-type hydrogen storage powders from oxide precursors at low energy consumption [$< 5.5 \text{ kWh (kg-LaNi}_5\text{)}^{-1}$].

2518

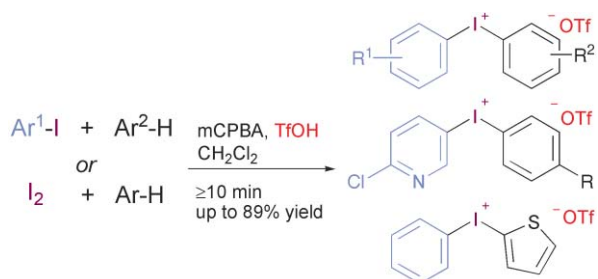


Mesoporous single-crystal Co₃O₄ templated by cage-containing mesoporous silica

Wenbo Yue, Adrian H. Hill, Andrew Harrison and Wuzong Zhou*

Mesoporous single-crystal Co₃O₄ was obtained using cage-containing mesoporous silicas, FDU-12 and SBA-16, as templates and the structural characterisation was made by XRD, HRTEM and nitrogen adsorption-desorption while SQUID magnetometry was used to probe the magnetic character.

2521

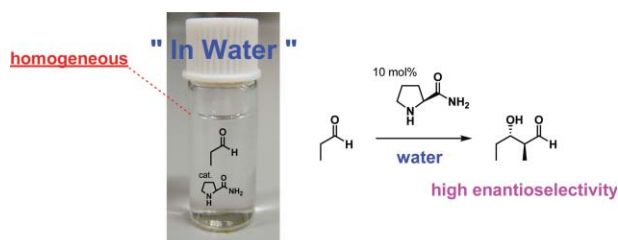


High-yielding one-pot synthesis of diaryliodonium triflates from arenes and iodine or aryl iodides

Marcin Bielawski and Berit Olofsson*

Unsymmetric and symmetric diaryliodonium triflates are synthesized from both electron-deficient and electron-rich substrates in a fast, high yielding, and operationally simple protocol employing arenes and aryl iodides or iodine.

2524



Small organic molecule in enantioselective, direct aldol reaction “in water”

Seiji Aratake, Takahiko Itoh, Tsubasa Okano, Takahiro Usui, Mitsuru Shoji and Yujiro Hayashi*

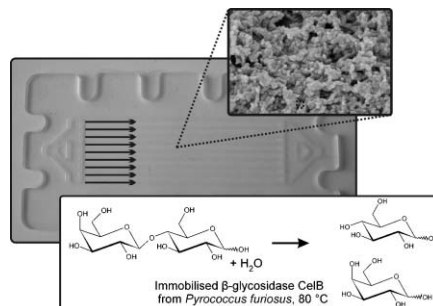
A small organic molecule, Pro-NH₂, catalyzing the enantioselective aldol reaction “in water” not merely “in the presence of water” with good enantioselectivity has been discovered for the first time.

2527

Development of a microfluidic immobilised enzyme reactor

Malene S. Thomsen, Peter Pölt and Bernd Nidetzky*

A microfluidic immobilised enzyme reactor was used for kinetic characterisation of a thermophilic β -glycosidase under pressure-driven flow conditions and continuous conversion of lactose by this enzyme at 80 °C.

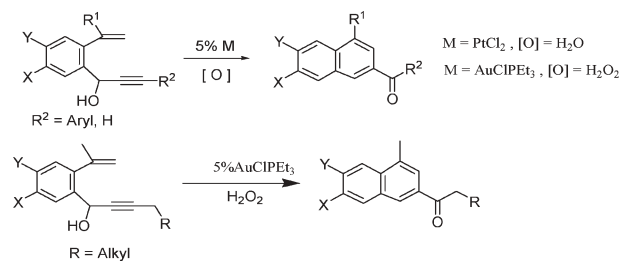


2530

Pt- and Au-catalyzed oxidative cyclization of 2-ethenyl-1-(prop-2'-yn-1'-ol)benzenes to naphthyl aldehydes and ketones: catalytic oxidation of metal-alkylidene intermediates using H₂O and H₂O₂

Bhanu Pratap Taduri, Shariar Md. Abu Sohel, Hsin-Mei Cheng, Guan-You Lin and Rai-Shung Liu*

2-Ethenyl-1-(prop-2'-yn-1'-ol)benzenes were cyclized through catalytic oxidation with PtCl₂/CO/H₂O and PEt₃AuCl/H₂O₂; the metal-naphthylidene intermediates were identified and oxygenated with water and H₂O₂, respectively.

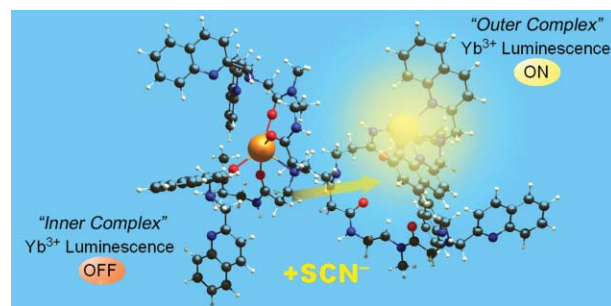


2533

Dendrimer container for anion-responsive lanthanide complexation and “on-off” switchable near-infrared luminescence

Hiroshi Tsukube,* Yukiko Suzuki, Dharam Paul, Yumiko Kataoka and Satoshi Shinoda

A new dendrimer-type ligand dynamically switched the lanthanide complexation and luminescence profiles in response to external anions.

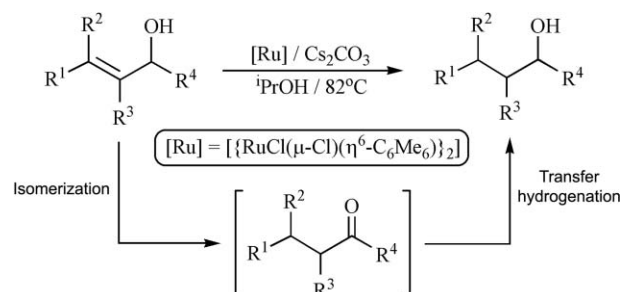


2536

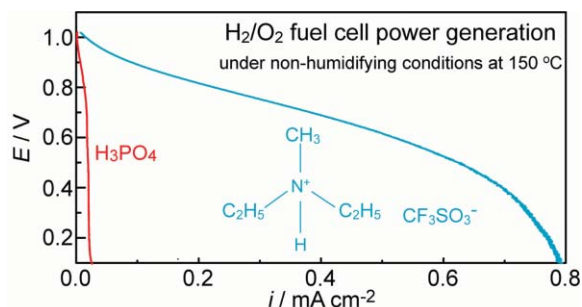
Ruthenium-catalyzed reduction of allylic alcohols: An efficient isomerization/transfer hydrogenation tandem process

Victorio Cadierno,* Javier Francos, José Gimeno* and Noel Nebra

A general and efficient procedure for the selective reduction of the C=C bond in allylic alcohols, through a ruthenium-catalyzed isomerization/transfer hydrogenation tandem process, has been developed.



2539



Bronsted acid–base ionic liquids for fuel cell electrolytes

Hirofumi Nakamoto and Masayoshi Watanabe*

A simple protic ionic liquid obtained from the combination of diethylmethylamine and trifluoromethanesulfonic acid exhibits the remarkable results as a medium temperature fuel cell electrolyte under non-humidifying conditions, affording a higher and stable open-circuit potential, wide liquid temperature range, and high thermal stability.

ADDITIONS AND CORRECTIONS

2542

Stefan K. Weidt, C. Logan Mackay,
Pat R. R. Langridge-Smith and
Peter J. Sadler

Platination of superoxide dismutase with cisplatin: tracking the ammonia ligands using Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS)

Zhimou Guo, Aiwen Lei, Yongping Zhang,
Qing Xu, Xingya Xue, Feifang Zhang and
Xinmiao Liang

“Click saccharides”: novel separation materials for hydrophilic interaction liquid chromatography

		<p>Comments received from just a few of the thousands of satisfied RSC authors and referees who have used ReSourCe - the online portal helping you through every step of the publication process.</p> <p>authors benefit from a user-friendly electronic submission process, manuscript tracking facilities, online proof collection, free pdf reprints, and can review all aspects of their publishing history</p> <p>referees can download articles, submit reports, monitor the outcome of reviewed manuscripts, and check and update their personal profile</p> <p>NEW!! We have added a number of enhancements to ReSourCe, to improve your publishing experience even further.</p> <p>New features include:</p> <ul style="list-style-type: none"> • the facility for authors to save manuscript submissions at key stages in the process (handy for those juggling a hectic research schedule) • checklists and support notes (with useful hints, tips and reminders) • and a fresh new look (so that you can more easily see what you have done and need to do next) <p>Go online today and find out more.</p> <p style="text-align: right;"><small>Registered Charity No. 207890</small></p>
	<p style="text-align: center;">‘I wish the others were as easy to use.’</p>	
<p style="text-align: center;">‘ReSourCe is the best online submission system of any publisher.’</p>		
<p>RSC Publishing www.rsc.org/resource</p>		

AUTHOR INDEX

- Agger, Jonathan R., 2473
Alex, Audrey, 2500
Anderson, Michael W., 2473
Aratake, Seiji, 2524
Badía, Dolores, 2509
Beppu, Shiori, 2485
Bielawski, Marcin, 2521
Blake, Alexander J., 2512
Cadierno, Victorio, 2536
Carrillo, Luisa, 2509
Chen, George Z., 2515
Chen, Wenzhang, 2488
Cheng, Ai-Ling, 2470
Cheng, Hsin-Mei, 2530
Cheng, Siqing, 2497
Coles, Simon J., 2494
Couty, François, 2500
Dabros, Marta, 2476
David, Olivier, 2500
Davies, David T., 2494
Dowden, James, 2512
Du, Miao, 2467
Edaan, Esra, 2494
Foster, Simon R., 2512
Fowler, Greg, 2482
Francos, Javier, 2536
Furuichi, Kimiaki, 2485
Gao, En-Qing, 2470
Gao, Song, 2470
Gimeno, José, 2536
Guo, Zhimou, 2491
Han, Buxing, 2497
Harrison, Andrew, 2518
Hayashi, Yujiro, 2524
Hill, Adrian H., 2518
Hu, Xiaohong, 2515
Hursthouse, Michael B., 2494
Ingalls, Laura R., 2503
Ito, Shuji, 2479
Itoh, Takahiko, 2524
Jin, Xianbo, 2515
Kataoka, Yumiko, 2533
Katsuda, Takayuki, 2479
Kim, Dongho, 2479
Kim, Kil Suk, 2479
Kitagawa, Yasutaka, 2485
Kiyobayashi, Tetsu, 2467
Koolmeister, Tobias, 2506
Kozaki, Masatoshi, 2485
Kuratsu, Masato, 2485
Larmanjat, Bénédicte, 2500
Lee, Jun, 2503
Lei, Aiwen, 2491
Liang, Xinmiao, 2491
Lin, Guan-You, 2530
Liu, Na, 2470
Liu, Rai-Shung, 2530
Ma, Meng, 2515
Marrot, Jérôme, 2500
Marson, Charles M., 2494
McArthur, Sally L., 2482
Meza, L. Itzel, 2473
Morrell, James M., 2494
Mu, Jinxia, 2488
Nakamoto, Hirofumi, 2539
Nebra, Noel, 2536
Nidetzky, Bernd, 2527
Noh, Su Bum, 2479
Okada, Keiji, 2485
Okano, Tsubasa, 2524
Olofsson, Berit, 2521
Osuka, Atsuhiko, 2479
Paul, Dharam, 2533
Pearce, Alice, 2512
Pollock, Neal, 2482
Pölt, Peter, 2527
Saito, Kei, 2503
Sato, Kazunobu, 2485
Scobie, Martin, 2506
Shinoda, Satoshi, 2533
Shiomi, Daisuke, 2485
Shoji, Mitsuru, 2524
Slevin, Åsa, 2506
Sohel, Shariar Md. Abu, 2530
Suzuki, Shuichi, 2485
Suzuki, Yukiko, 2533
Taduri, Bhanu Pratap, 2530
Takui, Takeji, 2485
Tanaka, Koichiro, 2485
Thalladi, Venkat R., 2476
Thomsen, Malene S., 2527
Tsukube, Hiroshi, 2533
Twyman, Lance J., 2482
Uria, Uxue, 2509
Usui, Takahiro, 2524
Vicario, Jose L., 2509
Wang, Dihua, 2515
Warner, John C., 2503
Watanabe, Masayoshi, 2539
Welham, Melanie J., 2512
Wu, Xiaofeng, 2449
Xiao, Jianliang, 2449
Xu, Qiang, 2467
Xu, Qing, 2491
Xue, Xingya, 2491
Yamaguchi, Kizashi, 2485
Yin, Xuefeng, 2488
Yin, Yan, 2488
Yue, Wenbo, 2518
Zhang, Feifang, 2491
Zhang, Jianling, 2497
Zhang, Yongping, 2491
Zhang, Zhaofu, 2497
Zhong, Rui-Qin, 2467
Zhou, Wuzong, 2518
Zhu, Yong, 2515
Zou, Ru-Qiang, 2467

FREE E-MAIL ALERTS AND RSS FEEDS

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.



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 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 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).

ChemComm

Make an impact

***ChemComm*, a leading weekly international journal for the publication of communications on important new developments, supplies a vibrant blend of high quality research from across the chemical sciences.**



With rapid publication times, a rigorous peer review process and an impact factor of 4.426, *ChemComm* has high visibility (indexed in MEDLINE) and is the perfect choice for work that commands universal respect.

Offering the flexibility of a 3 page communication limit and additional unique features such as html enhancement with our new Project Prospect (www.projectprospect.org), *ChemComm* celebrates more than 40 years of publishing excellence with a service that's out of this world.

Submit your work to *ChemComm* now and get light years ahead of the competition!

RSC Publishing

www.rsc.org/chemcomm

Registered Charity Number 207890

Energy & the Chemical Sciences

Sugar catalysts can turn waste vegetable oil into biodiesel

A sweet future for biodiesel

As fossil fuel reserves start to run dry, alternative fuel sources such as biodiesel, which is made from renewable biological material, are needed. Now, Min-Hua Zong at the South China University of Technology, Guangzhou, and colleagues have used a sugar catalyst to prepare biodiesel from waste vegetable oil. Sugar catalysts, made by the sulfonation of partially carbonized D-glucose, have previously been used for making biodiesel from new vegetable oils, but had never been successfully used in making biodiesel from waste oil.

According to Zong, one factor holding back the widespread use of biodiesel is the cost of the vegetable oil starting materials. And the presence of free fatty acid impurities in waste vegetable oil makes it difficult to convert this cheap and readily available potential fuel source into biodiesel. A number of solid acid catalysts, such as zeolites, have found limited success in converting waste oil to biodiesel,



but they can't operate effectively under the required harsh conditions. Sulfated zirconia has shown to be a very effective

Sugar catalysts aren't put off by the impurities in waste vegetable oil

catalyst for the reaction, but the cost of the rare zirconium metal is prohibitive. Zong's sugar catalysts have a higher activity than zeolites, and are cheaper to prepare than the zirconia catalysts.

Zong is committed to further research in this area. 'Environmentally-friendly production of cheap renewable fuels is very important,' she said. 'I am sure that biodiesel research is a growth area and that sugar catalysts will be an important part of it.'

Mark Keane, a chemical engineer at Herriot-Watt University, Edinburgh, UK, agreed that this work could be significant. 'The use of sugars as catalytic agents to convert waste oils is certainly intriguing and could potentially serve as a progressive approach to a burgeoning waste treatment issue,' he said.

Rebecca Gillan

Reference

Min-Hua Zong *et al.*, *Green Chem.*, 2007, 9, 434
DOI: 10.1039/b615447f

Energy themed issues in RSC journals

Green Chemistry presents research on Fuel Synthesis and Processing

PCCP explores Alternative Fuel Technologies in a series of issues

New Energy Materials are highlighted in the *Journal of Materials Chemistry*

Dalton Transactions is hosting a web theme issue on CO₂ at Metal Centres

Journal of Environmental Monitoring takes a look at Organic Contaminants: Sources, Fate, Behaviour & Effects



To find out more about energy at the RSC visit: www.rsc.org/energy

Research Highlights

Rhenium builds model bridges with uranium

Safer storage of nuclear waste

Nuclear waste repositories could be safer places, thanks to UK chemists, who have revealed the likely structure of a contaminant in reprocessed nuclear fuel.

Nuclear fuel is generally reprocessed by extracting out the actinide metals uranium and plutonium. However, this extracted material is often contaminated with another radioactive metal, technetium, which can catalyse unwanted side reactions and complicate waste storage. Now, Iain May, David Collison and colleagues at the University of Manchester have discovered how technetium, in the form of pertechnetate $[\text{TcO}_4]^-$, is extracted during reprocessing.

'Pertechnetate would traditionally be classed as a weakly coordinating anion,' said May, 'and we were very interested in why pertechnetate so effectively co-extracted.' Pertechnetate contaminates the extracted material by forming a



Reprocessed nuclear fuel often contains radioactive technetium as a contaminant

complex with uranium, said May. Studying perrhenate, $[\text{ReO}_4]^-$, a non-radioactive analogue of pertechnetate, the team showed that perrhenate can act as a bridge between two uranium ions, as well as a simple, singly bonding ligand.

'The demonstration of perrhenate as an inner-sphere ligand in these

uranyl complexes serves as a good model for how pertechnetate may coordinate actinyl compounds in general,' said Thomas Albrecht-Schmitt, an expert in actinide complexes at Auburn University, Alabama, US.

'A better molecular understanding of the behaviour of pertechnetate in this waste could ultimately aid safe and cost-effective treatment and disposal,' said May. 'Nuclear power is now being seriously considered by many countries as a key component of a secure "carbon neutral" energy policy. Future fuel processing technology will require a sound fundamental understanding of actinide and fission product coordination chemistry.'

James Mitchell Crow

Reference

Gordon H. John *et al.*, *Dalton Trans.*, 2007, 1603
DOI: 10.1039/b614481k

Enzymes bound to electrode take away the need for mediator molecule

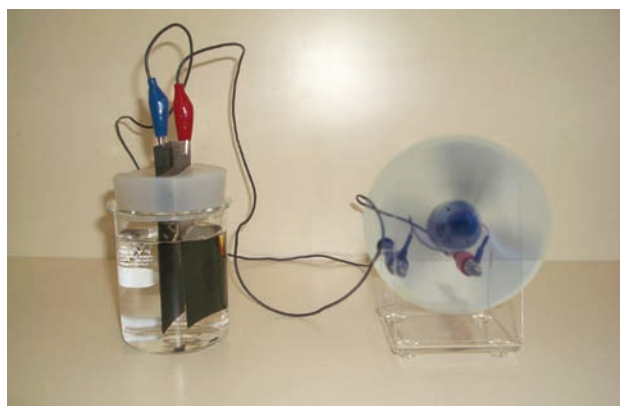
Simply biofuels

A simple enzyme-based biofuel cell has been made by a team of Japanese scientists.

The cell, made by Kenji Kano, Seiya Tsujimura and colleagues at Kyoto University, Japan, uses enzymes to catalyse oxidation of D-fructose and reduction of dioxygen to generate electricity.

The fuel is oxidised by one enzyme at the anode, and the electrons reduce dioxygen via another enzyme at the cathode.

Most previous biofuel cells have needed a mediator molecule, which is stable in two oxidation states, to speed up electron transfer from the enzyme to the electrode. By engineering carbon electrodes with carbon nanoparticles, the team bound a fructose oxidising enzyme, D-fructose dehydrogenase, onto



The cell in action

Reference

Y Kamitaka *et al.*, *Phys. Chem. Chem. Phys.*, 2007, DOI: 10.1039/b617650j

the electrode surface, increasing the speed of electron transfer to the anode without needing a mediator. Another enzyme, laccase from *Trametes sp.*, was used to reduce dioxygen at the anode, completing

the circuit.

Eliminating the need for mediators may simplify the construction of biofuel cells, and as the device can operate under mild conditions, Kano hopes that 'one compartment biofuel cells may be developed as power sources of implantable devices within humans, such as pacemakers, insulin pumps, sensors and prosthetic units.'

Frederic Barriere of the University of Rennes, France, said the work is a significant development, and that he 'awaits impatiently future developments such as refining such electrodes towards a layer by layer approach to increase the maximum current density.'

Victoria Chapman

To find out more about energy at the RSC visit: www.rsc.org/energy

Interview

Investing in a greener future

Richard Pike gives his thoughts on the energy debate



Richard Pike

Richard Pike is the Chief Executive of the Royal Society of Chemistry. Dr Pike has worked in a wide spectrum of scientific, engineering and management roles in the UK and internationally, with a long track record in the chemical sector notably in the oil, gas and petrochemicals industries.

What do you think are the important issues in the energy sector at the moment?

Undoubtedly climate change and security of energy supply, but also clarity in what we teach our children about energy, its use and consequences.

What motivated you to work in the energy industry?

It was probably a classic example of parental influence! My father worked as a chartered engineer, in the shipping sector of the oil industry. As a child, I was surrounded by books on science and engineering, and experienced - even as a ten-year old - having a tour of the engine room of one of the world's largest oil tankers, and being shown around an oil refinery. At school I was interested in mathematics and the physical sciences, and at Cambridge University studied engineering with a BP scholarship. Energy has been in my blood since!

What attracted you to the job of CEO of the RSC?

I had had a fascinating 30 years in the oil and gas industry, working all over the world, with a 5-year interlude as Director General of the Institution of Mechanical Engineers. It meant I appreciated the significance of chemistry in underpinning many of the issues facing the world - and their solutions - and had the experience of running a learned society. But I was not entirely familiar with all the topics now covered by the chemical sciences, nor indeed the precise workings of the chemistry profession, and therefore the job would be an interesting challenge. And that is what it has turned out to be!

How do you think the RSC can contribute to the energy debate?

We lobby key decision makers on matters relating to energy policy, research, funding and the availability of highly skilled people. And, the RSC educates people at all levels about the key scientific and technical issues associated with energy.

In the next 20-50 years what do you think the key challenges are for the chemical sciences in terms of energy?

There is a need to decarbonise transport by developing highly efficient biofuels, lightweight construction materials, hybrid and electric vehicles, battery technology and hydrogen as a fuel. Additionally, there is a need to maximise the efficiency of conventional vehicles and fuels. We must harness renewable energy more efficiently,

particularly to improve the efficiency in the next generation of photovoltaic cells. It is important to develop carbon capture and storage technology so that the vast coal reserves and the remaining oil and gas resources that will be exploited are done so with minimal green house gas (GHG) emissions. Finally, and perhaps most importantly we must invest in skilled people and high quality research and development such that sustainable energy technologies can be developed for the future.

How can the chemical sciences help with the energy problem?

The chemical sciences underpin almost all aspects of energy and are critical in developing new energy options. Perhaps the most exciting issues are the development of photovoltaics, new biofuels and solving the problem of energy storage. For photovoltaic devices the key issues are improving efficiency and reducing cost - work on artificial photosynthesis is particularly exciting. For biofuels, which are currently made from food crops, there is competition for land between food and fuel. This could be eliminated if next generation biofuels are made from lignocellulosic biomass, such as straw or wood. This may result in yield improvements and carbon emission reduction compared with current biofuels. Finally, energy storage is a critical issue as there are limited options for both large and small scale storage. Hybrid and electric vehicles and intermittent renewable energy sources (e.g. wind power) are limited by current storage technologies. New developments here, such as those in the areas of lithium based batteries and "lab on a chip" devices could be vital in developing new energy technologies.

Are there any scientists you most admire and why?

I admire those who have challenged the status quo, and have provided order to what seemed uncoordinated or inconsistent observations at the time. I always have time to read about Darwin, Mendeleev, Einstein and Bohr. More latterly, the popular work of Crick and Watson, and others, in understanding the genetic code has been fascinating.

The next generation of scientists will play a key role - if you had one piece of advice to pass onto them, what would it be?

Be enthusiastic, look at the big picture, and make a difference.....but get your facts straight!

To read the full interview visit: www.rsc.org/energy

News & Policy

The RSC responds to the energy challenge

Filling the energy gap

The next half-century will almost certainly be a period of significant change in Europe and globally when it comes to the provision of energy. Concerns over energy security and improved predictions on the consequences and costs of climate change will be key drivers toward an energy policy that promotes diversity over reliance on one or two main energy sources.

In July 2006 the government published a report 'The Energy Challenge' which described its energy policy and the long term challenges facing the UK. In particular that the UK will become increasingly reliant on imported oil and gas as North Sea reserves diminish, and that several nuclear and coal fired power stations are closed. Indeed, it is expected that the UK will be importing as much as 90% of its gas requirements by 2020, and in the medium term the UK will have a shortfall in electricity of approximately 25GW by 2025. To put this in perspective the current peak electricity demand is 60GW.

To counteract the growing



The UK will be importing as much as 90% of its gas requirements by 2020

reliance on imported energy the report proposed a number of measures. These included extending the EU Emissions Trading Scheme and Climate Change Levy to encourage companies to invest in cleaner energy-producing technology both in the UK and abroad; encouraging individuals and companies to save energy through education and new products; encouraging the use of cleaner-combined heat and power plants; developing a diverse energy system based on several fuel types, routes and storage facilities and finally investing in new power stations.

The RSC responded to the report with the following key points. The UK energy policy must promote a diverse energy mix avoiding over reliance on a single energy source; a clear coordinated energy policy is essential and should be long-term, unbiased toward specific technologies and independent (there must be cross party consensus); that technology alone will not be enough in closing the gap, reducing demand must also

be addressed; and finally that the chemical sciences will play a crucial role in developing clean energy technologies in the medium and long term. The RSC also believe that a UK geological repository for nuclear waste is also necessary as part of the long term solution.

It is clear that the chemical sciences will make important contributions in the development and implementation of new energy strategies. The transition from an economy based on fossil fuels to a more sustainable energy mix will require considerable ingenuity from chemists and the other science and engineering disciplines. Scientists will have to develop both sustainable energy systems and also find more efficient ways of producing, refining and using fossil fuels during the transition.

To read the full report 'The Energy Challenge' visit www.dti.gov.uk/energy/review/ and to find out more about the RSC energy policy please contact Dr Jeff Hardy (tel: +44 (0)20 7440 3395; email: hardyj@rsc.org)

Focusing on the future

The rapid growth of interest in energy and environmental issues has created the need for authoritative reviews on such matters. This need has been addressed by many RSC authors and much of this work is presented in the renowned book series Issues in Environmental Science and Technology, titles include *Transport and the Environment* and *Chemicals in the Environment: Assessing and Managing Risk*. Other popular titles include *Clean Energy* (Dell, Rand), *Sustainability and Environmental Impact of Renewable Energy Sources* (Harrison, Hester) and *Management of Aging Graphite Reactor Cores* (Neighbour).

Expanding on this, is the world class Specialist Periodical Report



Key energy related books from the RSC

on Catalysis, Volume 19. Catalysis is essential in the processes used to find cost efficient and environmentally sound methods of converting natural resources into fuels and energy. This book, fully referenced to the primary literature, brings together the most recent work of recognised international experts and includes chapters on The Catalysis of Biodiesel Synthesis, and Catalytic Reforming of Liquid Hydrocarbon Fuels for Fuel Cell Applications, Promotion Effects in Co-based Fischer-Tropsch Catalysis.

To find out more visit the RSC eBook Collection www.rsc.org/ebooks
<http://www.rsc.org/Publishing/Books/envchem.asp>

Do you RSS?



RSS feeds from the RSC keep you up to date with the latest published research. By setting up RSS feeds, preferably using feed reader software, you will be alerted to the latest Advance Articles published on the RSC website.

The RSS feed for each journal contains both the graphical abstract and the text from the journal's contents page. Find out more at www.rsc.org/rss

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.

Royal Society of Chemistry: Registered Charity No. 207890.

RSC Publishing