

IN THIS ISSUE

ISSN 0306-0012 CODEN CSRVBR 34(4) 293–368 (2005)

In this issue...

Chemical Science – a ‘snapshot’ of the latest news and developments across the chemical sciences
www.rsc.org/chemicalscience



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



Cover

See Santiago Alvarez, Pere Alemany and David Avnir, p. 313.

Near-enantiomers in Nature, exact enantiomers in the molecular domain, the objects shown are chiral. How much chirality do they have? This question is addressed for the case of transition metal compounds, using *Continuous Chirality Measures*.

Front cover image reproduced with permission of Professor Santiago Alvarez, *Chem. Soc. Rev.*, 2005, 34, 313.

CHEMICAL SCIENCE

C25

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

April 2005/Volume 2/Issue 4

www.rsc.org/chemicalscience

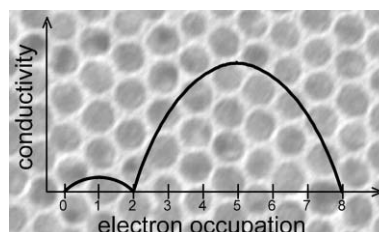
TUTORIAL REVIEWS

299

Electron-conducting quantum dot solids: novel materials based on colloidal semiconductor nanocrystals

Daniël Vanmaekelbergh* and Peter Liljeroth

The opto-electrical properties of quantum dot solids depend critically on the occupation of the quantum confined orbitals of the nanocrystal building blocks and the coupling between them.



EDITORIAL STAFF

Managing editor

Robert Eagling

Publishing assistant

Jackie Cockrill

Team leader, serials production

Helen Saxton

Technical editors

Sandra Jones

Ken Wilkinson

Production administration coordinator

Sonya Spring

Publisher

Adrian Kybett

Chemical Society Reviews (print: ISSN 0306-0012; electronic: ISSN 1460-4744) is published 12 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 Portland Customer Services, Commerce Way, Colchester, Essex, CO2 8HP. Tel +44 (0) 1206 226050; Email sales@rscdistribution.org

2005 Annual (print + electronic) subscription price: £395; US\$650. 2005 Annual (electronic) subscription price: £355; US\$585. 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 Society Reviews, c/o Mercury Airfreight International Ltd., 365 Blair Road, Avenel, NJ 07001. All dispatches outside the UK by Consolidated Airfreight.

Advertisement sales: Tel +44 (0) 1223 432243; Fax +44 (0) 1223 426017; E-mail advertising@rsc.org

CSR

Chemical Society Reviews

www.rsc.org/csr

CSR publishes accessible, succinct and reader-friendly articles on topics of current interest in the chemical sciences. The promotion of international and multidisciplinary awareness and cooperation is particularly encouraged. CSR publishes two article types: tutorial reviews, which present an accessible introduction to the topic, and critical reviews, which provide a deeper evaluation of the current literature.

EDITORIAL BOARD

Editorial board

David Parker, (Chair) Durham
david.parker@durham.ac.uk
Fabio Biscarini, Bologna
f.biscarini@ism.bo.cnr.it
Carsten Bolm, Aachen
carsten.bolm@oc.rwth-Aachen.de
Bertrand Castro, Gentilly
Bertrand.Castro@sanofi-synthelabo.com
Luisa de Cola, Amsterdam
ldc@anorg.chem.uva.nl
Anne Dell, London
a.dell@ic.ac.uk
John de Mello, London
j.demello@imperial.ac.uk

Odile Eisenstein, Montpellier
odile.eisenstein@univ-montp2.fr
Wilhelm Huck, Cambridge
wtsh2@cam.ac.uk
Kenneth D. M. Harris, Cardiff
harriskdm@cardiff.ac.uk
George Marston, Reading
g.marston@reading.ac.uk
Chris Orvig, Vancouver
orvig@chem.ubc.ca
Jon Preece, Birmingham
j.a.preece@bham.ac.uk
Claudio Zannoni, Bologna
claudio.zannoni@unibo.it

International advisory editorial board

Pat Bailey, Manchester, UK
p.bailey@umist.ac.uk
Nicolai Bovin, Moscow, Russia
bovin@carb.ibch.ru
George Christou, Gainesville, US
christou@chem.ufl.edu
Li-Xin Dai, Shanghai, China
dailx@mail.sioc.ac.cn
Huw Davies, Buffalo, US
hdavies@acsu.buffalo.edu
Sam Gellman, Madison, US
gellman@chem.wisc.edu

James T. Hynes, Boulder, US and Paris, France
hynes@spot.colorado.edu or hynes@junie.ens.fr
Masahiro Irie, Fukuoka, Japan
irie@cfstf.kyushu-u.ac.jp
Ari Koskinen, Helsinki, Finland
ari.koskinen@hut.fi
Milan Mirksich, Chicago, US
mmrksich@uchicago.edu
C.N.R. Rao, Bangalore, India
cnrrao@jncasr.ac.in
Ezio Rizzardo, Victoria, Australia
ezio.rizzardo@csiro.au

INFORMATION FOR AUTHORS

The Editorial Board commissions articles that encourage international, interdisciplinary progress in chemical research. The Board welcomes proposals for new tutorial reviews or critical reviews and the appropriate synopsis pro forma should be requested from the Editorial Office (csr@rsc.org). Detailed instructions for authors can be found on the web: <http://www.rsc.org/is/journals/current/chsocrev/csrifa.htm>

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.

© The Royal Society of Chemistry 2005. Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction

in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA. The Royal Society of Chemistry takes reasonable care in the preparation of this publication but does not accept liability for the consequences of any errors or omissions.

Ⓢ The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

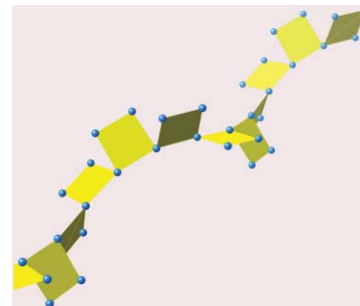
Royal Society of Chemistry: Registered Charity No. 207890.

313

Continuous chirality measures in transition metal chemistry

Santiago Alvarez,* Pere Alemany and David Avnir*

Is there a quantitative relation between the degree of chirality of a catalytic metal complex and the enantiomeric excess of its product? This and many other key-issues of chirality are treated with the continuous chirality measure, with emphasis on transition metal complexes.

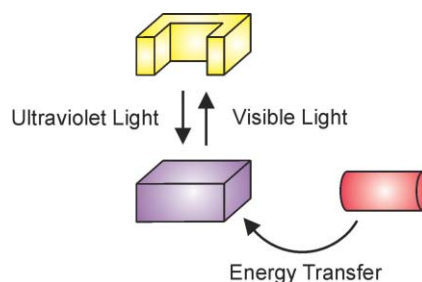


327

Electron and energy transfer modulation with photochromic switches

Francisco M. Raymo* and Massimiliano Tomasulo

Photochromic compounds modulate electron/energy transfer processes when one of their two states accepts electrons/energy from appropriate donors or when their isomerization controls donor–acceptor separations in multicomponent assemblies. Both mechanisms can be exploited to photoregulate efficiently the emissive behavior of fluorescent donors or acceptors.

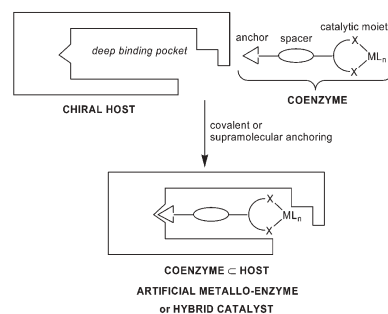


337

Artificial metalloenzymes: proteins as hosts for enantioselective catalysis

Christophe M. Thomas and Thomas R. Ward*

This review describes recent developments in the construction of artificial metalloenzymes for catalytic applications. The covalent modification of proteins as well as the noncovalent insertion of metal-complex catalysts into protein cavities is discussed. Attention is focused on the use of semisynthetic enzymes to produce efficient enantioselective hybrid catalysts for a given reaction. A special emphasis is placed upon the perspectives and challenges offered by this approach.

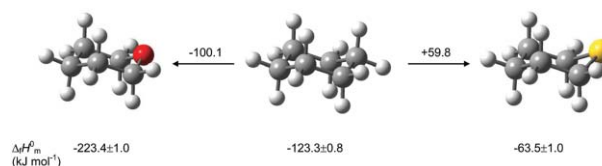


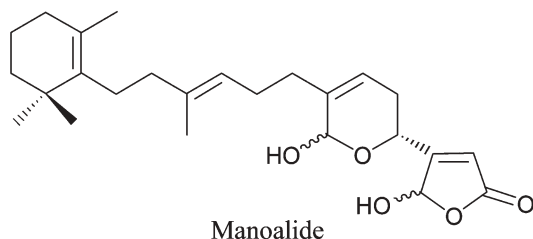
347

Calorimetric and computational study of sulfur-containing six-membered rings

Eusebio Juaristi, Rafael Notario and María Victoria Roux

Synergy of experimental thermochemical measurements and theoretical calculations yield a wealth of information on oxygen- and sulfur-containing heterocyclic compounds.



**Anti-inflammatory metabolites from marine sponges**

Robert A. Keyzers* and Michael T. Davies-Coleman

A critical review detailing the plethora of anti-inflammatory metabolites that have been isolated from marine sponges.

FREE E-MAIL ALERTS

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.

* 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).

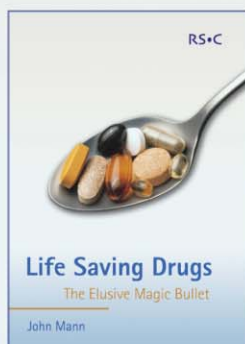
ADVANCE ARTICLES AND ELECTRONIC JOURNAL

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.

Life Saving Drugs

The Elusive Magic Bullet

By John Mann

**RSC Paperbacks**

An introduction to the discovery and development of antibacterial, anti-viral and anti-cancer drugs.

- describes the colourful characters behind the inventions
- highlights the huge improvements in quality of life and life-expectancy that these drugs have produced
- describes new drugs that have emerged as a result of knowledge of the human genome
- demonstrates ways in which the newer drugs are being designed to tackle disease at the genetic level
- well illustrated with chemical structures for all of the key drugs

Accessible to anyone interested in the history of drug development during the past 100 years.

Softcover | 2004 | viii + 248 | 0 85404 634 8 | £24.95 | Members' price £16.00

www.rsc.org/books/6348

Orders & further details **Sales & Customer Care**
 Royal Society of Chemistry • Thomas Graham House
 Science Park • Milton Road • Cambridge • CB4 0WF • UK

T +44(0)1223 432360 • F +44(0)1223 426017 • E sales@rsc.org
 Or visit our websites: www.rsc.org and www.chemsoc.org
 Registered Charity No. 207890

RS•C

RSCAd16110415colour