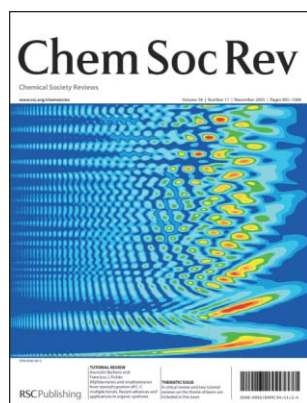


IN THIS ISSUE

ISSN 0306-0012 CODEN CSRVBR 34(11) 905–996 (2005)



Cover

See R. E. Carley, E. Heesel and H. H. Fielding, page 949. A plot illustrating the temporal evolution (y -axis) of the radial distribution function (colour) of a Rydberg electron wave packet localized along the radial coordinate (x -axis). Image reproduced by permission of R. E. Carley, E. Heesel and H. H. Fielding from *Chem. Soc. Rev.*, 2005, **34**, 949.



Inside cover

See Kostas Kostarelos and Andrew D. Miller, page 970. Schematic of an ABCD nanoparticle, a structural paradigm for viable, synthetic non-viral vector systems to enable nucleic acid delivery applications *in vitro*, *ex vivo* and *in vivo*. Image (Forepoint © IC-Vec Ltd) reproduced by permission of K. Kostarelos and A. D. Miller from *Chem. Soc. Rev.*, 2005, **34**, 970.

CHEMICAL SCIENCE

C81

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

November 2005/Volume 2/Issue 11

www.rsc.org/chemicalscience

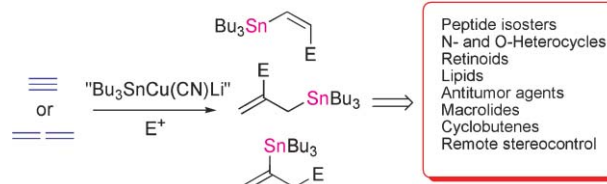
TUTORIAL REVIEWS

913

Allylstannanes and vinylstannanes from stannylation of C–C multiple bonds. Recent advances and applications in organic synthesis

Asunción Barbero* and Francisco J. Pulido*

This review describes the stannylation of allenes and alkynes as a powerful tool for the obtention of allyl- and vinylstannanes, which are useful intermediates in the synthesis of natural products, as well as efficient synthons for the stereocontrolled introduction of new stereogenic centers in organic molecules.



EDITORIAL STAFF

Editor

Robert Eagling

Publishing assistant

Jackie Cockrill

Team leader, serials production

Helen Saxton

Technical editors

Sandra Jones, Ken Wilkinson

Administration coordinator

Sonya Spring

Production secretaries

Rebecca Gotobed, Julie Thompson

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 RSC Distribution Services, c/o Portland Customer Services, Commerce Way, Colchester, Essex, UK 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.

PRINTED IN THE UK

Advertisement sales: Tel +44 (0) 1223 432243;

Fax +44 (0) 1223 426017; E-mail advertising@rsc.org

Chem Soc Rev

Chemical Society Reviews

www.rsc.org/chemsocrev

Chemical Society Reviews 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. Chemical Society Reviews 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

Chair

David Parker, 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, Muenster
decola@uni-muenster.de
Huw Davies, Buffalo, US
hdavies@acsu.buffalo.edu
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
Phil Gale, Southampton
philip.gale@soton.ac.uk
Kenneth D. M. Harris, Cardiff
harriskdm@cardiff.ac.uk
Wilhelm Huck, Cambridge
wtsh2@cam.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
Sam Gellman, Madison, US
gellman@chem.wisc.edu
Dirk Guldi, Erlangen, Germany
dirk.guldi@chemie.uni-erlangen.de
James T. Hynes, Boulder, US and Paris, France
hynes@spot.colorado.edu and hynes@junie.ens.fr

Masahiro Irie, Fukuoka, Japan
irie@cstf.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
Abraham Shanzer, Rehovot, Israel
abraham.shanzer@weizmann.ac.il

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). Full details of how to submit material for publication in Chemical Society Reviews are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be sent via ReSource: <http://www.rsc.org/resource>

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).

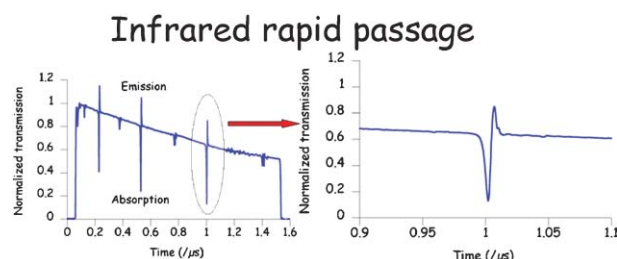
Royal Society of Chemistry: Registered Charity No. 207890.

921

Quantum cascade semiconductor infrared and far-infrared lasers: from trace gas sensing to non-linear optics

Geoffrey Duxbury,* Nigel Langford,
Michael T. McCulloch and Stephen Wright

Quantum cascade lasers have the potential to revolutionise infrared spectroscopy, from the rapid detection of atmospheric gases to coherent excitation in non-linear optics.

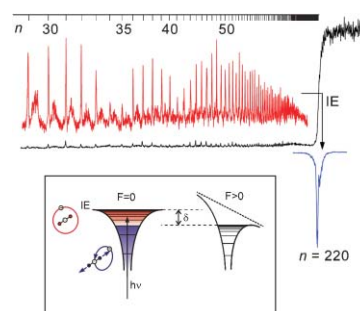


935

Photoelectron spectroscopy without photoelectrons: Twenty years of ZEKE spectroscopy

Martin C. R. Cockett

ZEKE spectroscopy provides a means to dramatically improve the resolving power of photoelectron spectroscopy by dispensing with photoelectrons altogether.



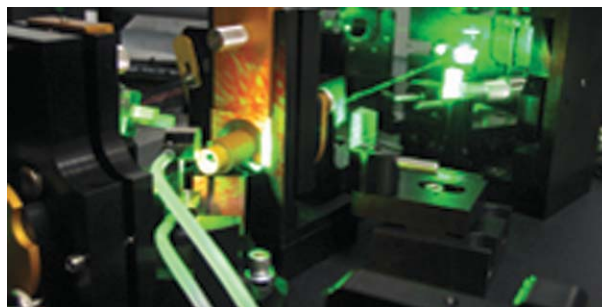
CRITICAL REVIEWS

949

Femtosecond lasers in gas phase chemistry

R. E. Carley, E. Heesel and H. H. Fielding*

Femtosecond lasers are continuing to have a major impact in the field of chemical reaction dynamics and coherent control.

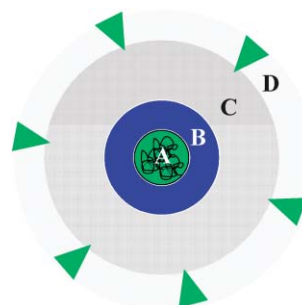


970

Synthetic, self-assembly ABCD nanoparticles; a structural paradigm for viable synthetic non-viral vectors

Kostas Kostarelos and Andrew D. Miller


From simple cationic liposomes/micelle systems to **ABCD** nanoparticles; how chemistry is actively contributing to the growing field of gene therapy research.



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.

Image courtesy of T. Kozłowski, *Phys. Chem. Chem. Phys.*, 2004, 11, 5



PCCP

Physical Chemistry Chemical Physics

A topical, international journal publishing the latest developments in physical chemistry, chemical physics and biophysical chemistry.

- Published by a learned society on behalf of 14 international learned societies
- Fast publication - typically 80 days for full papers, 40 days for communications
- High visibility - indexed in MEDLINE
- Research of the highest quality - published papers reviewed by at least two referees

RSCPublishing

www.rsc.org/pccp

Comprehensive Series in Photochemical & Photobiological Sciences

Series Editors:

D-P Häder *Friedrich-Alexander Universität, Erlangen, Germany*

G Jori *University of Padova, Italy*

Published with the European Society for Photobiology, this series provides comprehensive overviews on specific areas of photoscience

Titles in the series:

Lasers and Current Optical Techniques in Biology

0 85404 326 8 2004 £179.95

Photodynamic Therapy

0 85404 306 3 2004 £149.50

Photoreceptors and Light Signalling

0 85404 311 X 2004 £159.50

UV Effects in Aquatic Organisms and Ecosystems

0 85404 301 2 2003 £169.50

Readership

Academic researchers, physicians, graduate students, industrialists

Market

Photobiology; photochemistry; photomedicine; technology for light production, filtering and instrumentation

Format

Hardcover

Forthcoming title:

From DNA Photolesions to Mutations, Skin Cancer and Cell Death

E Sage, R Drouin and M Rouabhia

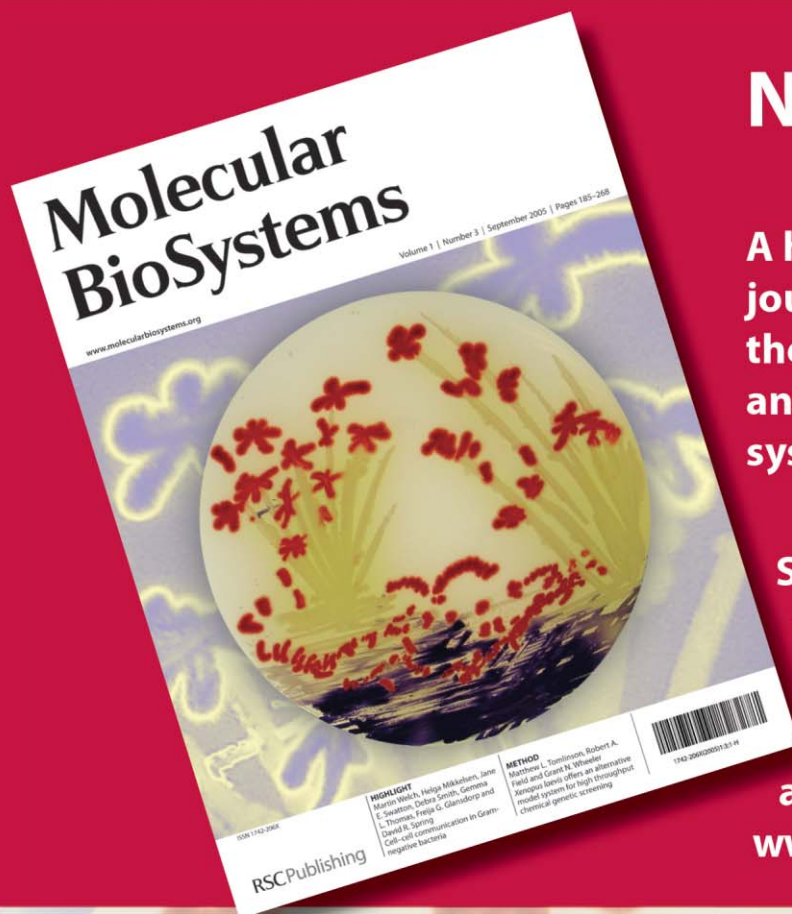
This book provides an authoritative source of information for photobiologists interested in the series of genetic events that occur in the skin and eventually lead to cancer.

With contributions from eminent scientists in the field, it includes the latest information on DNA photolesions and repair, as well as the key mechanisms of solar UV in skin cancer initiation and development. Significant information relating to UV-induced photolesions and mechanisms of skin tumour occurrence is also included.

0 85404 326 8 Due Spring 2006 £169.95



03080510



New for 2005

A high-impact chemical biology journal with a particular focus at the interface between chemistry and the -omic sciences and systems biology.

See for yourself – examples of papers are listed below.

For further details and FREE access to Issue 1, visit www.molecularbiosystems.org

New and recent articles:

Methods

Chiral sensing using a blue fluorescent antibody

Hana Matsushita, Noboru Yamamoto, Michael M. Meijler, Peter Wirsching, Richard A. Lerner, Masayuki Matsushita and Kim D. Janda

Simple reporter gene-based assays for hairpin poly(amide) conjugate permeability and DNA-binding activity in living cells

Bo Liu, Peng Yu, Prasanna G. Alluri and Thomas Kodadek

Review

On the track of antitumour ribonucleases

Antoni Benito, Marc Ribó and Maria Vilanova

Highlight

Visualising DNA: Footprinting and 1-2D Gels

Adam R. Urbach and Michael J. Waring

Communications

Synthesis of an IGD peptidomimetic with motogenic activity

Natalia Shpiro, Ian R. Ellis, Trevor J. Dines, Ana M. Schor, Seth L. Schor, David G. Norman and Rodolfo Marquez

Hypoxia-inducible factor prolyl hydroxylase 2 has a high affinity for ferrous iron and 2-oxoglutarate

Luke A. McNeill, Emily Flashman, Matthew R. G. Buck, Kirsty S. Hewitson, Ian J. Clifton, Gunnar Jeschke, Timothy D. W. Claridge, Dominic Ehrismann, Neil J. Oldham and Christopher J. Schofield

Paper

Interplay between exchange protein directly activated by cAMP (Epac) and microtubule cytoskeleton

Fang C. Mei and Xiaodong Cheng

Hot off the Press

The Editorial Board and their research groups highlight recent literature for the benefit of the community.