Pages 2381–2602 ISSN 0300–9580



Journal of the Chemical Society

Perkin Transactions 2

AN INTERNATIONAL JOURNAL OF

PHYSICAL ORGANIC CHEMISTRY

The Royal Society of Chemistry Journal of the Chemical Society, Perkin Transactions 2

Editorial Board

Professor M. S. Baird (Bangor) Professor A. G. Davies (London) Dr T. Gallagher (Bristol) Professor R. W. Hoffmann (Marburg) Professor B. C. Gilbert (York) (Chairman) Professor R. M. Kellogg (Groningen) Professor I. E. Markó (Louvain) Dr H. Maskill (Newcastle)

Professor S. M. Roberts (Exeter) Dr H. S. Rzepa (London) Dr P. L. Taylor (Slough)

International Advisory Board

P. Ahlberg (Göteborg) Y. Apeloig (Haifa) K. D. Asmus (Berlin) E. Baciocchi (Rome) A. L. J. Beckwith (Canberra) F. Bickelhaupt (Amsterdam)

E. Buncel (Kingston)

C. A. Bunton (Santa Barbara) J. F. Bunnett (Santa Cruz) A. G. Davies (London) L. Eberson (Lund) P. W. Fowler (Exeter) J. K. Kochi (Houston) P. Laszlo (Palaiseau)

J.-M. Lehn (Paris) L. Mandolini (Rome) R. A. Marcus (Pasadena) R. A. McClelland (Toronto) G. Modena (Padova) O. M. Nefedov (Moscow) L. Radom (Canberra)

D. Reinhoudt (Enschede) M. F. Ruasse (Paris) P. v. R. Schleyer (Erlangen) S. Steenken (Mulheim) C. J. M. Stirling (Sheffield) D. E. Sunko (Zagreb)

Editorial Staff

Editorial Manager and Editor, Perkin Trans. 2: Dr Sheila Buxton Editor, Perkin Trans. 1: Dr Eddie Smith Senior Assistant Editors: Miss Nicola Coward, Dr Adrian Kybett Assistant Editors: Dr Jonathan Griffiths, Dr Liz Milne, Dr Roxane Perret Gentil Editorial Secretaries: Mrs Mandy Scripps (Perkin Trans. 2), Miss Karen White (Perkin Trans. 1)

Manuscripts and correspondence on editorial

matters should be addressed to:

The Editor, Perkin Transactions 1 or 2 The Royal Society of Chemistry Thomas Graham House Science Park Cambridge UK CB4 4WF

Tel +44 (0) 223 420066 Fax +44 (0) 223 420247

E-Mail (INTERNET) RSC1@RSC.ORG

Manuscripts from North America should be

addressed to:

Professor T. Hudlicky North American Associate Editor Department of Chemistry Virginia Tech.

Blacksburg

VA 24061-0212 USA Tel +1 703 231 4509 Fax + 1 703 231 3941

E-Mail (INTERNET) THUD@VT.EDU

Advertisement sales: Tel +44 (0) 71 287 3091. Fax +44 (0) 71 494 1134

Information for Authors

The subject matter of Perkin Transactions 1 embraces all aspects of organic and bio-organic chemistry. These include synthetic organic chemistry of all types, organometallic chemistry, chemistry and biosynthesis of natural products, the relationship between molecular structure and biological activity, the chemistry of polymers and biological macromolecules, and medicinal and agricultural chemistry where there is originality in the science.

Perkin Transactions 2 deals with the physicochemical aspects of organic, organometallic and bio-organic chemistry including kinetic, mechanistic, structural, spectroscopic, and theoretical studies. Such topics include structure-activity relationships and physical aspects of biological processes and of the study of polymers and biological macromolecules.

All contributions are judged on the criteria of (i) originality and quality of scientific content and (ii) appropriateness of the length to the content of new science. Short papers are acceptable provided that they constitute full reports of completed pieces of work and are not fragments of more extensive studies. Preliminary accounts of novel and significant work of exceptional specialist interest, in any branch of organic chemistry, may be published as Communications in Perkin Transactions 1 or 2 as appropriate.

Further information on the submission of manuscripts is given on the inside back cover.

Members of the Perkin Editorial Board (who may be contacted directly or via the Editorial Office) welcome comments, suggestions, and advice on general policy matters concerning Perkin Transactions.

Perkin Transactions 2 (ISSN 0300-9580) is published monthly by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 4WF. All orders accompanied with payment should be sent directly to the Royal Society of Chemistry, Turpin Distribution Services Limited, Blackhorse Road, Letchworth, Herts, UK SG6 1HN. NB: Turpin Distribution Services Limited, distributors, is wholly owned by the Royal Society of Chemistry. 1994 Annual Subscription Rate EC £529.00, Rest of World £567.00, Canada (excl. GST) £595.00, USA \$992.00. Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank. Second class postage is paid at Rahway, NJ. Airfreight and mailing in the USA by Mercury Airfreight International Ltd. Inc., 2323 Randolph Avenue, Avenel, New Jersey, NJ 07001, USA and at additional mailing offices. USA POSTMASTER: Send address changes to Perkin Transactions 2, C/O Mercury Airfreight International Ltd. Inc., 2323 Randolph Avenue, Avenel, New Jersey, NJ 07001. All despatches outside the UK by Consolidated Airfreight. PRINTED IN THE UK.

© Royal Society of Chemistry, 1994. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form, or by any means, electronic, mechanical, photographic, recording, or otherwise, without prior permission of the publishers.