

JOURNAL OF THE CHEMICAL SOCIETY

Chemical Communications

Number 14
1984

CONTENTS

- 893 Characterization of Pentacarbonylvanadate(–III) and Hydridopentacarbonylvanadate(–II) by ^{13}C , ^{51}V , and ^1H N.M.R. Spectroscopy **Garry F. P. Warnock, Stephen B. Philson, John E. Ellis**
- 894 Spin-echo ^1H N.M.R. Spectroscopy: a New Method for studying Penicillin Metabolism **Jeremy R. Everett, Keith R. Jennings, Gary Woodnutt, Malcolm J. Buckingham**
- 896 The Preparation and Crystal Structures of Two Diphenylantimony Triacetate Hydrolysis Products: $[\text{Ph}_2\text{Sb}(\text{OAc})_2]_2\text{O}$ and $[(\text{Ph}_2\text{Sb}_4\text{O}_6) \cdot (\text{HOAc})_3] \cdot \text{CH}_2\text{Cl}_2$ **D. Bryan Sowerby, Michael J. Begley, Peter L. Millington**
- 897 Synthesis of 2-Aza-anthraquinone and 2-Azanaphthacenequinone 1-Chloro-derivatives as Key Intermediates for the Preparation of Antitumour Anthraquinone Analogues **Martine Croisy-Delcey, Emile Bisagni**
- 899 Determination of the Kinetic $\text{p}K_a$ of a Flavin 4a-Pseudobase from a Study of the Hydrolysis of 4a-Hydroxy-5-ethyl-3-methyl-lumiflavin in H_2O . The Oxygen Donation Potential of 4a-Hydroperoxyflavins **U. V. Venkataram, Thomas C. Bruice**
- 900 Thermolysis of Allene-1,1-dicarboxamides: Acceleration of the Intramolecular Diels–Alder Reaction by Intramolecular Hydrogen Bonding and a Novel Bicyclo[2.2.2]- to Bicyclo[3.2.1]-alkadiene Rearrangement **Gerhard Himbert, Klaus Diehl, Gerhard Maas**
- 902 Inhibition of Penicillin Biosynthesis by δ -(L- α -Amino- δ -adipyl)-L-cysteinyglycine. Evidence for Initial β -Lactam Ring Formation **Jack E. Baldwin, Edward P. Abraham, Craig G. Lovel, Hong-Hoi Ting**
- 904 The Opposite Diastereoselectivity in the Alkylation and Protonation of Enolates **Yoshinori Yamamoto, Kazuhiro Maruyama**
- 905 The Alkoxy–Alkoxyacylation of Allenes **Howard Alper, Frederick W. Hartstock, Bertrand Despeyroux**
- 906 Structure of Pachyaldehyde, a Novel Norditerpene from the Brown Alga, *Pachydictyon coriaceum* **Midori Ishitsuka, Takenori Kusumi, Hiroshi Kakisawa, Yasushi Nagai, Yoshiyuki Kawakami, Tadashi Sato**
- 908 I.R. Spectroscopic Evidence for Surface Vibrational Modes formed upon Dehydroxylation of Alumina **Jean-Claude Lavalley, Mohammed Benaissa**
- 909 Rapid Access to the Highly Oxygenated Aspidosperma Alkaloids Vindoline, Vindorosine, and Cathovaline **Bruno Danielli, Giordano Lesma, Giovanni Palmisano, Renata Riva**
- 911 Application of Ultrasound in Carbohydrate Chemistry. Synthesis of Optically Pure Functionalised Hexahydro-anthracenes and -naphthacenes **Steven Chew, Robert J. Ferrier**
- 913 Stereospecific Bimolecular Displacement at a Carbon–Nitrogen Double Bond leading to Open Chain Imidoyl Azides **Anthony F. Hegarty, Maria Mullane**
- 914 On the Accessibility of *cis*-Bisphosphine Intermediates in Homogeneous Hydrogenation catalysed by Wilkinson's Complex, $\text{ClRh}(\text{PPh}_3)_3$ **John M. Brown, Andrew R. Lucy**
- 915 Contrasting Reactivity of Mono- and Di-nuclear Dihydrido-*trans*-Bisphosphine-rhodium and -iridium Complexes towards Alkenes **John M. Brown, Lewis R. Canning, Andrew R. Lucy**
- 917 Punctatins B and C (Antibiotics M95154 and M95155): Further Sesquiterpene Alcohols from the Fungus *Poronia punctata* **John R. Anderson, Raymond L. Edwards, Andrew A. Freer, Richard P. Mabelis, J. Philip Poyser, Harry Spencer, Anthony J. S. Whalley**
- 919 An Efficient Thermal Route to Arenesulphenylnitrenes **Robert S. Atkinson, Michael Lee, John R. Malpass**
- 920 Novel Heterocyclic Systems from Selective Oxidation at the β -Pyrrolic Position of Porphyrins **Maxwell J. Crossley, Lionel G. King**
- 922 Generation of Thioaldehydes from Sodium Thiosulphate *S*-Esters (Bunte Salts) **Gordon W. Kirby, Alistair W. Lochead, Gary N. Sheldrake**
- 923 Cation Effects on the Cyclic Voltammograms of Azotoluene and the Potassium Cation Selectivity of the Electrochemically Reduced Azo-cryptand 7,16-Azobis(1,3-phenylenemethylene)-1,4,10,13-tetraoxa-7,16-diazaoctadecane **Deborah A. Gustowski, Vincent J. Gatto, Angel Kaifer, Luis Echegoyen, Robert E. Godt, George W. Gokel**
- 925 Diels–Alder Reactivity of Pyrano[3,4-*b*]indol-3-ones, Stable, Synthetic Equivalents of Indole-2,3-quinodimethanes **Christopher J. Moody**
- 926 A Concise Synthesis of the Antitumour Alkaloid Ellipticine **Christopher May, Christopher J. Moody**
- 927 Hypervalent Iodine Oxidation of α,β -Unsaturated Ketones: Chromone, Flavone, Chalcone, and Flavanone **Robert M. Moriarty, Om Prakash, Wade A. Freeman**

- 929 Photocontrol of Polypeptide Membrane Permeabilities by *cis-trans* Isomerism in Side Chain Azobenzene Groups
Takatashi Kinoshita, Morimasa Sato, Akira Takizawa, Yoshiharu Tsujita
- 930 Stereoselective Synthesis of the *B/C/D* Ring Systems of Aphidicolane and Stemodane Diterpenes **Chuzo Iwata, Toshiya Morie, Naoyoshi Maezaki, Hisafumi Shimamura, Tetsuaki Tanaka, Takeshi Imanishi**
- 932 A New Method of Synthesis of Arylmalononitriles catalysed by a Palladium Complex **Mitsunari Uno, Koji Seto, Shigetoshi Takahashi**
- 933 Ring Opening Reactions of $[M(CO)_3(\eta^1\text{-Ph}_2\text{PCH}_2\text{PPh}_2)(\eta^2\text{-Ph}_2\text{PCH}_2\text{PPh}_2)]$ $M = \text{Cr, Mo, or W}$ with Rh or Ir Complexes to give Bimetallic Systems: Synthesis of $[(OC)_3Mo(\mu\text{-Ph}_2\text{PNHPPH}_2)_2RhCl(CO)]$ **Adrian Blagg, Gary R. Cooper, Paul G. Pringle, Richard Robson, Bernard L. Shaw**
- 935 Gas-phase High-resolution N.M.R. Spectroscopy: a Potential Tool for Structural Chemistry **Tsuneo Hirano, Takashi Miyajima, Kenichi Kato, Hisaya Sato**
- 936 Preparation and X-Ray Structure of a Rhodium(III)–Rhodium(I) Pyrazolate Complex with a Mercury Atom Asymmetrically Bridging the Metal Atoms **Antonio Tiripicchio, Fernando J. Lahoz, Luis A. Oro, M. Teresa Pinillos**
- 938 Electrodeposition of Thin-film CdSe from Sulphite Solution **Michael Cocivera**
- 939 Studies on a Model Copper Mono-oxygenase System: Peroxo–Cu^{II} Binuclear Intermediates in the Hydroxylation of an Aromatic Ring **Ninian J. Blackburn, Kenneth D. Karlin, Martin Concannon, Jon C. Hayes, Yilma Gultneh, Jon Zubieta**
- 941 Improvement of the Photoelectrochemical Cleavage of H₂S over CdS Suspensions using RuS₂ as a Catalyst **D. Harry M. W. Thewissen, Eddy A. van der Zouwen-Assink, Klaas Timmer, Alois H. A. Tinnemans, Adri Mackor**
- 942 Highly Unsaturated Three-bladed Propeller Molecules. Synthesis and Ring Inversion Dynamics of Two [4.4.4]Propellatriene-triones **Heiner Jendralla, Christopher W. Doecke, Leo A. Paquette**
- 944 Nitrous Oxide as a Nucleophile in the Formation of a New Reactive Intermediate from Benzyl Cations in the Solvolysis of Benzyl Azoxytosylate **H. Maskill, William P. Jencks**
- 946 Composites of Conducting Polymers: Polyacetylene–Polypyrrole **Göran Ahlgren, Bernd Krische**
- 948 The Addition of Chlorosulphonyl Isocyanate to an Allenyl Acetate. The Preparation of a Versatile Intermediate for Antibiotic Synthesis **John D. Buynak, Hassan Pajouhesh, Deborah L. Lively, Yegna Ramalakshmi**
- 949 The High Yield Synthesis of an Unsaturated Osmium Cluster; the X-Ray Crystal Structure of $[Os_3(CO)_8\text{-}(H)\{Ph_2PCH_2P(Ph)C_6H_4\}]$ **Jennifer A. Clucas, Douglas F. Foster, Marjorie M. Harding, Anthony K. Smith**
- 951 Thermal 2,5-Cycloaddition of *N*-Arylmaleimides to Phenols **Derek Bryce-Smith, Andrew Gilbert, Ian S. McColl, Paul Yianni (in part)**

952 **Corrigenda**

- Sulphur Chromium Complexes: Syntheses and Crystal Structures of $(\eta^5\text{-C}_5\text{H}_5)_2\text{Cr}_2(\text{CO})_4\text{S}$ and $(\eta^5\text{-C}_5\text{H}_5)_2\text{Cr}_2(\text{CO})_5\text{S}_2$
Lai Yoong Goh, Trevor W. Hambley, Glen B. Robertson
- Stereocontrolled Synthesis of the Ecdysone Side Chain *via* a Furan Derivative **Tetsuji Kametani, Masayoshi Tsubuki, Hiroko Furuyama, Toshio Honda**
- Naphtho[1,8-*cd*:4,5-*c'*']bis[1,2]diselenole **Atsushi Yamahira, Takashi Nogami, Hiroshi Mikawa**

AUTHOR INDEX

- Abraham, Edward P., 902
 Ahlgren, Göran, 946
 Alper, Howard, 905
 Anderson, John R., 917
 Atkinson, Robert S., 919
 Baldwin, Jack E., 902
 Begley, Michael J., 896
 Benaissa, Mohammed, 908
 Bisagni, Emile, 897
 Blackburn, Ninián J., 939
 Blagg, Adrian, 933
 Brown, John M., 914, 915
 Bruice, Thomas C., 899
 Bryce-Smith, Derek, 951
 Buckingham, Malcolm J., 89
 Buynak, John D., 948
 Canning, Lewis R., 915
 Chew, Steven, 911
 Clucas, Jennifer A., 949
 Cocivera, Michael, 938
 Concannon, Martin, 939
 Cooper, Gary R., 933
 Croisy-Delcey, Martine, 897
 Crossley, Maxwell J., 920
 Danieli, Bruno, 909
 Despeyroux, Bertrand, 905
 Diehl, Klaus, 900
 Doecke, Christopher W., 942
 Echegoyen, Luis, 923
 Edwards, Raymond L., 917
 Ellis, John E., 893
 Everett, Jeremy R., 894
 Ferrier, Robert J., 911
 Foster, Douglas F., 949
 Freeman, Wade A., 927
 Freer, Andrew A., 917
 Furuyama, Hiroko, 952
 Gatto, Vincent J., 923
 Gilbert, Andrew, 951
 Godt, Robert E., 923
 Goh, Lai Yoong, 952
 Gokel, George W., 923
 Gultneh, Yilma, 939
 Gustowski, Deborah A., 923
 Hambley, Trevor W., 952
 Harding, Marjorie M., 949
 Hartstock, Frederick W., 905
 Hayes, Jon C., 939
 Hegarty, Anthony F., 913
 Himbert, Gerhard, 900
 Hirano, Tsuneo, 935
 Honda, Toshio, 952
 Imanishi, Takeshi, 930
 Ishitsuka, Midori, 906
 Iwata, Chuzo, 930
 Jencks, William P., 944
 Jendralla, Heiner, 942
 Jennings, Keith R., 894
 Kaifer, Angel, 923
 Kakisawa, Hiroshi, 906
 Kametani, Tetsuji, 952
 Karlin, Kenneth D., 939
 Kato, Kenichi, 935
 Kawakami, Yoshiyuki, 906
 King, Lionel G., 920
 Kinoshita, Takatoshi, 929
 Kirby, Gordon W., 922
 Krische, Bernd, 946
 Kusumi, Takenori, 906
 Lahoz, Fernando J., 936
 Lavalley, Jean-Claude, 908
 Lee, Michael, 919
 Lesma, Giordano, 909
 Lively, Deborah L., 948
 Lochead, Alistair W., 922
 Lovel, Craig G., 902
 Lucy, Andrew R., 914, 915
 Maas, Gerhard, 900
 Mabelis, Richard P., 917
 McColl, Ian S., 951
 Mackor, Adri, 941
 Maezaki, Naoyoshi, 930
 Malpass, John R., 919
 Maruyama, Kazuhiro, 904
 Maskill, H., 944
 May, Christopher, 926
 Mikawa, Hiroshi, 952
 Millington, Peter L., 896
 Miyajima, Takashi, 935
 Moody, Christopher J., 925, 926
 Moriarty, Robert M., 927
 Morie, Toshiya, 930
 Mullane, Maria, 913
 Nagai, Yasushi, 906
 Nogami, Takashi, 952
 Oro, Luis A., 936
 Pajouhesh, Hassan, 948
 Palmisano, Giovanni, 909
 Paquette, Leo A., 942
 Philson, Stephen B., 893
 Pinillos, M. Teresa, 936
 Poyser, J. Philip, 917
 Prakash, Om, 927
 Pringle, Paul G., 933
 Ramalakshmi, Yegna, 948
 Riva, Renata, 909
 Robertson, Glen B., 952
 Robson, Richard, 933
 Sato, Hisaya, 935
 Sato, Morimasa, 929
 Sato, Tadashi, 906
 Seto, Koji, 932
 Shaw, Bernard L., 933
 Sheldrake, Gary N., 922
 Shimamura, Hisafumi, 930
 Smith, Anthony K., 949
 Sowerby, D. Bryan, 896
 Spencer, Harry, 917
 Takahashi, Shigetoshi, 932
 Takizawa, Akira, 929
 Tanaka, Tetsuaki, 930
 Thewissen, D. Harry M. W., 941
 Timmer, Klaas, 941
 Ting, Hong-Hoi, 902
 Tinnemans, Alois H. A., 941
 Tiripicchio, Antonio, 936
 Tsubuki, Masayoshi, 952
 Tsujita, Yoshiharu, 929
 Uno, Mitsunari, 932
 van der Zouwen-Assink, Etty A., 941
 Venkataram, U. V., 899
 Warnock, Garry F. P., 893
 Whalley, Anthony J. S., 917
 Woodnutt, Gary, 894
 Yamahira, Atsushi, 952
 Yamamoto, Yoshinori, 904
 Yianni, Paul, 951
 Zubietta, Jon, 939

NEW Publications

ORDERING
RSC Members should send their orders to:
The Royal Society of Chemistry,
The Membership Officer, 30 Russell Square,
London WC1B 5DT.

Non-RSC Members
The Royal Society of Chemistry,
Distribution Centre, Blackhorse Road,
Letchworth, Herts SG6 1HN, England.

from The Royal Society of Chemistry

Specialist Periodical Reports

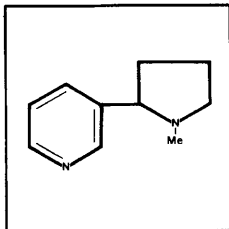
The Alkaloids Vol. 13

Senior Reporter: M. F. Grundon

A review of the literature published during the period July 1981 and June 1982.

Brief Contents:

Biosynthesis; Pyrrolidine, Piperidine, and Pyridine Alkaloids; Tropane Alkaloids; Pyrrolizidine Alkaloids; Indolizidine Alkaloids; Quinolizidine Alkaloids; Quinoline and Acridone Alkaloids; β -Phenylethylamines and the Isoquinoline Alkaloids; Aporphinoid Alkaloids; Amaryllidaceae Alkaloids; *Erythrina* and Related Alkaloids; Indole Alkaloids; *Lycopodium* Alkaloids; Diterpenoid Alkaloids; Steroidal Alkaloids; Miscellaneous Alkaloids.



"The Royal Society of Chemistry publication on *The Alkaloids* is the central point of the alkaloid year."—*J. David Phillipson, University of London, reviewing Vol. 10.*

Hardcover 343pp 0 85186 367 1
Price £33.00 (\$59.00)
RSC Members £19.00

Organometallic Chemistry Vol. 11

Senior Reporters: E. W. Abel and F. G. A. Stone.
A review of the literature published during 1981.

Brief Contents:

Group I: The Alkali and Coinage Metals, Group II: The Alkaline Earths and Zinc and its Congeners; Group III: Boron; The Carboranes, including their Metal Complexes; Group III: Aluminium, Gallium, Indium, and Thallium; Group IV: The Silicon Group; Arsenic, Antimony, and Bismuth; Metal Carbonyls; Organometallic Compounds containing Metal—Metal Bonds; Substitution Reactions of Metal and Organometal Carbonyls with Group V and VI Ligands; Sigma-Bonded Organometallic Compounds of Transition Elements of Groups IIIA to VIIA; Complexes containing Metal—Carbon σ -Bonds of the Groups Iron;

Cobalt, and Nickel; Metal—Hydrocarbon π -Complexes, π -Cyclopentadienyl, π -Arene, and Related Complexes; Homogeneous Catalysis by Transition-metal Complexes; Organometallic Compounds in Biological Chemistry; Diffraction Studies of Organometallic Compounds.

"All organometallic chemists will want to read all or parts of this book."—*D. A. Sweigart, J. Am. Chem. Soc., reviewing Vol. 9.*

Hardcover 567pp 0 85186 591 7
Price £77.00 (\$138.00) RSC Members £38.00

Organophosphorus Chemistry Vol. 14

Senior Reporters: D. W. Hutchinson and J. A. Miller

A review of the literature published between July 1981 and June 1982.

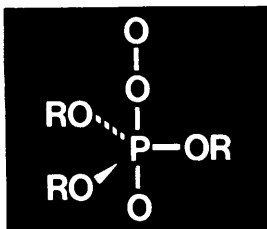
Brief Contents:

Phosphines and Phosphonium Salts; Quinquevalent Phosphorus Compounds; Halogenophosphines and Related Compounds; Phosphine Oxides and Related Compounds; Tervalent Phosphorus Acids; Quinquevalent Phosphorus Acids; Phosphates and Phosphonates of Biochemical Interest; Nucleotides and Nucleic Acids; Ylides and Related Com-

pounds; Mass Spectrometry of Organophosphorus Compounds; Physical Methods.

"The whole series of volumes represents an extremely useful reference work on progress in this area of chemistry over the past 10 years and, ideally, every chemist active in the field should keep a set of these volumes on his bookshelf."—*Kurt Moederitzer, Monsanto Company, reviewing Vol. 10.*

Hardcover 360pp 0 85186 126 1
Price £56.00 (\$100.00) RSC Members £34.00



Photochemistry Vol. 14

Senior Reporter: D. Bryce-Smith

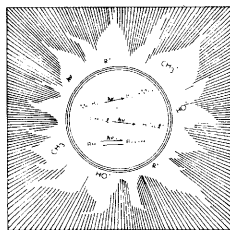
A review of the literature published between July 1981 and June 1982.

Brief Contents:

Part I: Physical Aspects of Photochemistry; Part II: Photochemistry of Inorganic and Organometallic Compounds; Part III: Organic Aspects of Photochemistry; Part IV: Polymer Photochemistry; Part V: Photochemical Aspects of Solar Energy Conversion.

"The latest in this series of reviews of literature continues to be indispensable to physical and organic photochemists and makes interesting reading for those active on the periphery of this subject."—*David I. Schuster, Jnl. of Medicinal Chemistry, reviewing Vol. 10.*

Hardcover 592pp 0 85186 125 3
Price £88.00 (\$157.00) RSC Members £46.00



Terpenoids and Steroids Vol. 12

Senior Reporter: J. R. Hanson

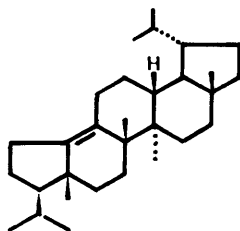
A review of the literature published between September 1980 and August 1981.

Brief Contents:

Part I: Terpenoids: Monoterpenoids; Sesquiterpenoids; Diterpenoids; Triterpenoids; Carotenoids and Polyterpenoids; Part II: Steroids: Physical Methods; Steroid Reactions and Partial Syntheses.

"Everyone interested in the chemistry of terpenoids and/or steroids should have access to this volume and the others in the series."—*Norman J. Doorenbos, Jnl. of Pharmaceutical Sciences, reviewing Vol. 10.*

Hardcover 366pp 0 85186 356 6
Price £56.00 (\$100.00)
RSC Members £34.00



ROYAL SOCIETY OF CHEMISTRY

The Royal Society of Chemistry, Burlington House Piccadilly London W1V 0BN