

## Book reviews

**Organic Chemistry (4th edition)**  
R J Fessenden and J S Fessenden  
Brooks/Cole, California, 1990.  
Pp 1137. £19.95. ISBN 0 534 98175 5

This book is already very well known to undergraduate students as an excellent introduction to the topic of organic chemistry. Now in its fourth edition, some new important additions have been made. Modern synthetic techniques have been introduced, some photochemical theory and reactions have been mentioned, nucleic acids now occupy a full chapter, and a lot more emphasis has been placed on spectroscopic techniques for structure elucidation. The number of worked-out sample problems within the chapters, as well as the large number of unsolved problems at the end of the chapters, makes this fourth edition even more attractive.

Organometallic reagents have been mentioned throughout the text in connection with specific syntheses. The best-known of these, the organomagnesium (Grignard) reagents, have been correctly placed in the chapter dealing with the preparation of alcohols. Organolithiums are also mentioned in connection with alcohol synthesis. There are also brief references to dialkylcuprates in the synthesis of ketones, organosilicons have featured as NMR standards, and mercuric acetate has been mentioned in connection with the hydration of alkenes.

As this is primarily a text book of organic chemistry, the right emphasis on organometallic reagents has been achieved.

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**Inclusion Phenomena in Inorganic, Organic and Organometallic Hosts**  
December 1987  
D Reidel, Dordrecht.  
472 pp. Dfl 195, £59.50. ISBN 90 277 2601 9.

This work originates from a joint meeting at Lancaster University on Inclusion Phenomena and Cyclodextrins. As the fourth and third events respectively in each series, they have become well established. The working nature of the meetings was reflected by the publication of a daily report summarizing the high spots of the previous day's events. This report (The Daily Gleaner) is reproduced in this book. It certainly brings out the

vitality and timeliness of the meeting, but direct reproduction in the original form rather detracts from the presentation and appearance of this book, which consists of 50 extended abstracts and 21 original contributions; unfortunately individual authors and contribution titles cannot be listed in a review of this length. Typefaces and styles differ in the camera-ready text and therefore overall appearance and cohesiveness are not its best features.

The cyclodextrins are  $\alpha$ -1-4-linked cyclic oligomers of D-glycopyranose which can form inclusion complexes with a range of substances, including drug molecules. Hence the logic of the joint meeting. Of particular interest to organometallic chemists, for example, are the sections by Clayden, Dobson, Heyes and Wiseman on metallocenes in host lattices; by Goldberg, Shinar and Navon on organometallic ionophore chemistry (with  $(\eta\text{-C}_5\text{H}_5)\text{Co}[\text{PO}(\text{OC}_2\text{H}_5)_2]_3^-$ ) and by Beer and Keefe on the synthesis of metallocene calix [4] arenes.

All of the contents of this volume have appeared in various issues of the *Journal of Inclusion Phenomena*. Clearly, subscribers to that journal will not need to purchase the book. As it consists of extended abstracts, poster papers and an up-to-the-minute internal conference dialogue publication much may be gleaned from this book. It is chiefly useful as a sourcebook for research ideas and as an overview of the field for those who already have an interest or some prior knowledge. It is not organized in the systematic way that would recommend its use as a teaching resource or as a reference point for undergraduate students. At £59.50 it is certainly going to be on the shelves of workers in the field.

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**Tin-Based Antitumour Drugs**  
M Gielen (ed)  
NATO ASI Series H: Cell Biology, Volume 37.  
Springer-Verlag, 1990.  
217 pages. Hardcover. DM 128.  
ISBN 3 540 50417 6

This book is a collection of papers written by speakers at the NATO Advanced Research Workshop on the Effect of Tin upon Malignant Cell Growth held in Brussels, Belgium, in July 1989 and is published as Volume 37 in the NATO ASI Series H. The aim of the workshop was to bring together experts from different disciplines working in the field of tin-based antitumour

drugs, to contribute to the critical assessment of existing knowledge in the topic, to identify the directions for future research and to promote close working relationships between the different countries and professional experiences.

The first paper deals generally with the role of metal complexes in cancer therapy. After some discussion of the development of cisplatin and its direct derivatives, the paper goes on to review other metal complexes, especially those involving ruthenium, gallium, germanium and titanium. A structure–activity relationship of tumour-inhibiting bis( $\beta$ -diketonato) metal complexes is reviewed.

The second paper deals with tin compounds and their potential as pharmaceutical agents. It starts with a short introduction to the present use of tin compounds and goes on to discuss the use of tin protoporphyrin for the successful treatment of neonatal jaundice. Then follows a discussion of the antitumour properties of tin compounds, their mode of action and their use in photodynamic therapy of cancer. The paper ends with references to other pharmaceutical uses including antiviral agents.

The third paper offers a hypothesis on the role of natural tin hormones in senescence. It attempts to integrate the role of tin compounds as potential therapeutic agents for malignant disease with the ancillary role of endogenous tin in mammalian development and ageing. In the fourth paper a report is made of speciation studies on tin and the bioavailability of tin in biofluids, whilst a fifth paper discusses cellular interaction of organotin compounds in relation to their antitumour activity. The book is completed by three short papers entitled (i) Selectivity of Antiproliferative Effects of Dialkyltin Compounds *in vitro* and *in vivo*, (ii) Computer Assisted Structure–Activity Correlations of Organotin Compounds as Potential Anticancer and Anti-HIV Agents, (iii) Route of Administration as a Determinant of the Tissue Disposition and Effects of TBTO on Cytochrome P-450-Dependent Drug Metabolism.

The topics included in this book are wide-ranging and should supply interesting reading to all those engaged in research in the field of tin-based antitumour drugs. The book offers a critical assessment of existing knowledge in this new and important subject.

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### Transition Metals in Total Synthesis

P J Harrington

Wiley–Interscience, New York, 1990

xvi + 484 pages, £47.50

ISBN 0 471 61300 2

Although the use of transition-metal complexes as reagents for the synthesis of complex organic molecules

has provided many important organic transformations of profound synthetic potential, the practising synthetic organic chemist is only now beginning to think about using transition-metal organometallics in synthesis. However, this book should help to further this approach.

The text opens with a brief introduction of the layout of the book which is followed by 14 chapters on syntheses organized according to the metal. Thus Chapters 2 and 3 describe relatively simple organopalladium chemistry ( $\sigma$ -aryls and  $\eta^3$ -allyls), Chapter 4  $\eta^4$ -diene iron tricarbonyl complexes, Chapter 5  $\eta^3$ -allyliron tricarbonyl complexes, Chapter 6 iron-stabilized oxallyl cationic complexes, Chapter 7 alkyne cyclotrimerization, Chapter 8 dicobalt octacarbonyl alkyne complexes, Chapter 9 the Khand–Pauson cyclopentenone synthesis, Chapter 10 phthaloyl- and maleoyl-cobalt complexes, Chapter 11  $\eta^6$ -arenechromium tricarbonyl complexes, and Chapter 12 and 13 pentacarbonylchromium carbene complexes and titanium carbene complexes respectively, providing a nice comparison of the differing reactivity of these two classes of carbene complexes. Finally, Chapters 14 and 15 describe some advances in transmetallation reactions, increasingly important in carbon–carbon bond formation. Target molecules covered include ( $\pm$ )aurantioclavine, ( $\pm$ )ibogamine, ( $\pm$ )limaspermine, (+)thienamycin, tropane alkaloids, ( $\pm$ )estrone, ( $\pm$ )cyclocolorone, ( $\pm$ )hirsutic acid C, ( $\pm$ )quadron, ( $\pm$ )coriolin, ( $\pm$ )acorenone, ( $\pm$ )daunomycinone, ( $\pm$ )- $\Delta^{9(12)}$ -cannabinol, and prostaglandins.

Each chapter contains a brief introduction to the biological activity and previous synthesis of target molecules, background organometallic chemistry necessary for synthesis, and complete total synthesis of target molecules from commercially available materials.

This text developed from a lecture series on advanced organic synthetic methods will make interesting and informative reading, both for students and research chemists, in an area which is going to become increasingly important. I like the book and can recommend it.

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### The elements their origin, abundance and distribution

P A Cox

Oxford Scientific Publications, Oxford

ISBN 0 19 855298-X

This is an excellent and extremely readable book, for university undergraduate level and above, on how elements are formed in the stars and distributed on Earth.