

ential crystallization and chromatography to resolve enantiomers are also covered. Other chapters describe the use of enantiopure building blocks in the construction of the optically pure final compound and the radio-synthesis of compounds such as  $^{14}\text{C}$ -labelled clozapine and fluvastatin for use in elucidating their fate *in vivo*.

The book finishes with a chapter on perhaps some of the most contentious topics in the pharmaceutical industry today: process validation; good manufacturing practice; and the road to the overall goal of process and development chemistry, which is the attainment of government approval to manufacture a drug.

The text is richly illustrated throughout with practical examples and case studies based on the author's own experience of many years in the pharmaceutical industry, although there are only a few examples involving organometallic compounds. The author writes lucidly with a clear enthusiasm for the subject. This book opens up the area between medicinal and industrial chemistry and should appeal to any chemist with a fundamental interest in pharmaceutical development.

TREVOR WRIGHT

*Current Drugs Ltd, London*

**Chemistry of the Elements**, 2nd edn  
N. N. Greenwood and A. Earnshaw  
Butterworth-Heinemann, Oxford, 1997  
340 pages. £35.00 (paperback)  
ISBN 0-7506-3365-4

This reviewer has to admit at the outset that 'Greenwood and Earnshaw' is one of his favourite, full-scale, inorganic texts. In my hands, the first edition proved wide-ranging, up-to-date and user-friendly enough for 'chalk-face' activity with undergraduates, and yet it was still a sufficiently impressive resource to be used in lecture preparation. So I liked it. It should then be said that the second edition continues the good work of the first, without a dramatic increase of size, and should be acquired by all serious chemistry undergraduates and graduate students (and inorganic chemistry staff). I think it is good value for money. I do not think the book is aimed at the populist undergraduate market; although it is well presented, no colour is used and the form of the diagrams is pretty basic (although clear). It may not appeal greatly to the CD ROM-, soundbite-oriented student as it is fairly traditional in style, and indeed it neither comes with nor makes any reference to, use of student-centred material. However, it is still excellent and (praise indeed?) a 1950–1960s student would probably think it an essential possession. I hope our 1990s students also come to this view; I shall do my best to help.

Readers of *Applied Organometallic Chemistry* will

want to know more of the book's treatment of the organometallic area. As might be expected, it is done in a traditional Periodic Group manner, with one overview chapter oriented to the transition elements. Page coverage is distributed as follows: Group 1 (5), Group 2 (9), Group 3 excluding B (11), Group 4 (6 + 10), Group 5 (8). Transition metals receive similar cover to the earlier Groups (1, 4, 3, 3), with greater detail being reserved for the heavier elements: Group 7 (8), Group 8 (9), Group 9 (5), Group 10 (6 pages).

As an introduction to organometallic chemistry for undergraduates in a general programme of chemistry, this book is very good. Students carrying out an organometallic project will need more detailed source material. Postgraduates in organometallic chemistry will need it as a 'grammar' of the subject. The industrial processes are generally covered, but as it is not the purpose of this work to act as an encyclopaedia, treatments are brief.

So, all chemists should buy this new edition, and use it.

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### Applications of Organometallic Compounds

Iwao Omae  
Wiley, Chichester, 1998  
vii + 518 pages. £85  
ISBN 0 471 97604 0

Iwao Omae will be known to organometallic chemists for his books on *Organometallic Intramolecular-Coordination Compounds* (Elsevier, 1986) and *Organotin Chemistry* (Elsevier, 1989). The present book is based on reviews of the organic compounds of 20 metals which appeared in *Kagaku Kogyo (Chemical Industry)* between 1990 and 1996.

The book is wider in scope than the title suggests. After a short introductory section, and a chapter on the history of organometallic chemistry, each of the remaining 20 chapters covers one specific metal. A description of the extraction of the metal from the ore is followed by an account of the preparation, structures and properties of its organometallic compounds. The chapter then ends with a survey of the applications of these compounds in organic synthesis and in medicine, agriculture and industry.

There has been some updating of the articles, but this could have been more thorough and there are few references later than 1994. Thus, for example, although there is extensive referencing to Wilkinson, Stone and Abel's first edition of *Comprehensive Organometallic Chemistry* (Pergamon, 1982) there is none to the second edition (Elsevier, 1995) which has two volumes devoted to organometallics in synthesis. Again, some books which I would regard as classics are not mentioned, such as