

## Book reviews

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*Handbook of Heterocyclic Chemistry*; by A.R. Katritzky, Pergamon Press, Oxford, 1985; 542 pages; Flexicover, U.S. \$ 29.95, £ 22.95; Hardcover, U.S. \$ 80, £ 61.50. ISBN 0 08 0307264 and 0 08 0262171.

This is in fact a multiauthor text based on chapters from the eight volume work 'Comprehensive Heterocyclic Chemistry'. It is a valuable text in its own right but will be particularly useful on the bookshelves of heterocyclic chemists who have access to the complete (and very expensive) work through their library. Reference is made to the larger work where appropriate but the text is well referenced in its own right and contains a great deal of information for its size. Saturated, unsaturated, and aromatic compounds are dealt with, the latter group comprising the major part of the work. The book is organised into three main sections describing structure, reactivity and synthesis of heterocyclic compounds

Since heterocyclic compounds are used as ligands, organometallic chemists may find the many tables of selected physical data particularly useful. These include X-ray and microwave-derived bond lengths and bond angles; ionisation energies;  $pK_a$  values; UV maxima; and  $^1H$ ,  $^{13}C$ ,  $^{14}N$  and  $^{15}N$  NMR spectra. In the main only heterocyclic compounds containing the heteroatoms nitrogen, oxygen and sulphur are discussed, so that for information on compounds which might be of more interest to organometallic chemists (P, As, Sb, Bi, Si, Ge, Pb, B and transition metal-containing heterocyclic compounds), the reader must refer to the larger work. Similarly, encapsulation of metals by heterocyclic compounds such as porphyrins and corrins, crown ethers and cryptates receives scant attention. Reasonable discussion is made of the synthesis and reactions of organometallic derivatives of heterocyclic compounds such as Grignard derivatives and sodium, lithium, and mercury compounds.

This work will be a useful and cheap handbook for practising heterocyclic chemists and will prove to be of some use in the departmental library of the organometallic chemist.

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*Houben–Weyl Methoden der Organischen Chemie, Carbocyclische  $\pi$ -Electronen-Systeme*, 4th edition, Volume V, part 2c, edited by H. Kropf, Georg Thieme Verlag, 1985, xiv + 870 pages, DM 940, ISBN 3-13-202804-5.

The Houben–Weyl series has as its purpose to give a detailed account of the synthesis and reaction of various classes of organic compounds. It thus complements the Gmelin inorganic and Beilstein organic series, which are more concerned with comprehensive listings of compounds and their properties. This present volume

deals with the preparation and transformations of conjugated, non-benzenoid carbocyclic systems which conform to the Hückel  $4n + 2$   $\pi$ -electron rule. Annulenes were discussed in Volume V, part 1d, whilst Volume IV, part 3 considered delocalised cyclopropene based systems, but there is little overlap with earlier volumes of the modern editions.

The volume is divided into three main sections, the first of which deals with charged aromatic species, considering in detail the cyclopropenyl cation, radical and anion, cyclopentadienyl anion, tropylium salts, cyclooctatetraenyl dianion and cyclononatetraenyl anion. The anions are generally considered as free species, though experience suggests that many of them could be classed as organometallic compounds, with considerable association in solution. Curiously, the anions receive much less attention than the cations. Transition metal  $\eta^6$ -tropylium complexes are considered rather briefly.

The second section deals with condensed non-benzenoid aromatic compounds, with pentalene, indacene, azulene, heptalene, pleiadiene and their derivatives being the most important species discussed. That most of the material refers to azulene and its derivatives reflects the balance of the literature published in this area. The final and longest section is somewhat more diverse, discussing molecules which may be considered to have some aromatic character by virtue of a polar resonance form. The most readily familiar are cyclopropenone, tropone, and tropolene, but thiones, imines and fulvenes are also treated in detail. Pentafulvene and its derivatives merit extensive coverage, including a number of syntheses using metallocenes as precursors.

The interest of this volume for the organometallic chemist is considerable, if somewhat specific. Many of the anionic species should properly be considered as organometallics, although it must be noted that there is little structural information relevant to this point in the text. Secondly, many of the species discussed are ligands which form a wide variety of important metal  $\pi$ -complexes. Hence a comprehensive and detailed account of their synthesis is extremely valuable.

As with all the volumes of the Houben–Weyl series, the production of this work is excellent. The text is well illustrated, making the material readily accessible even to the non German speaker. There are more than 4000 references running well into 1984, a general bibliography and a detailed index. It is noteworthy that material from numerous dissertations has been included, since many of these data have not been previously generally accessible. The price of this series is now so high that its purchase is within the budget of only the most affluent of libraries, but it remains an indispensable reference work.

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*Gmelin handbook of inorganic chemistry* 8th edition, *U – Uranium, Supplement Volume C5: Uranium Dioxide, UO<sub>2</sub>. Physical Properties. Electrochemical Behaviour*, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1986, xv + 317 pages, DM 1209. ISBN 3-540-93524-X.

This is the twenty-fifth volume which the Gmelin Institute has published concerning the chemistry of uranium (System No. 55) to appear since the main volume