

Science of Synthesis, Volume 12; Hetarenes and Related Ring Systems: Five-membered Hetarenes with Two Nitrogen or Phosphorus Atoms; By R. Neier. Thieme: Stuttgart, 2002, hardback, 1000 pp, €1750; ISBN 3-131-12261-7.

This is the fourth of the nine volumes of Science of Synthesis that will cover heteroaromatic compounds (hetarenes), and comprises seven chapters written by acknowledged experts in heterocyclic chemistry, some of whom have written similar chapters in other comprehensive treatises. Four of the chapters cover the more common ring systems – pyrazole and imidazole, and their benzo-fused derivatives indazole and benzimidazole. Given the importance of these particular heterocyclic systems in natural products and in synthetic pharmaceuticals, it is not surprising that over 80% of the book is devoted to their chemistry. The remaining 45–50 ring systems falling within the scope of the volume attract relatively scant attention, reflecting the fact that their chemistry is still mainly unexplored. The rest of the book is taken up by detailed keyword and author indexes.

Within each chapter the coverage is organised by the usual systematic approach that characterises the series. Thus within each product class there is a general discussion of the ring system which addresses fundamental properties such as tautomerism, basicity and spectroscopy. This is followed by the methods of synthesis, and their variations, which are organised logically into ring synthesis (classified according to which bonds are formed in the process) and ring modification. The coverage of ring synthesis methods is extremely comprehensive although inevitably there are some omissions (including this Reviewer's work on benzimidazoles!)

For example, there are over a 100 methods (plus variations) listed for the ring synthesis of pyrazoles together with typical experimental procedures. In reality, of course, many of these methods are pretty obscure and are hardly every used, and although the text does contain the occasional commentary that one particular method is a commonly used approach, it would have been extremely useful if a short summary/conclusion had highlighted the most useful and versatile methods. Nevertheless all the major methods of ring synthesis are discussed in detail with numerous examples presented in table format.

The sections on synthesis by substituent modification effectively describe the chemistry of the ring system. Therefore the discussion of the replacement of an existing hydrogen summarises the metalation and electrophilic substitution (acylation, alkylation, nitration etc) reactions of the rings, whereas the substitution of an existing halogen addresses nucleophilic attack on the ring system. These reactions are discussed in the same logical order for each product class, and hence it is easy to find ones way around the individual chapters.

Overall the book is extremely well written; clear diagrams and tables are provided throughout, and the subject index and the detailed contents list make navigation of the 700 pages fairly straightforward. This book would be a very welcome addition to any library, where it would complement other similar works on heterocyclic chemistry.

C. Moody, University of Exeter, UK.