

Book Review

***Systematic Nomenclature of Organic Chemistry, A Directory to Comprehension and Application of its Basic Principles*, by D. Hellwinkel, Springer-Verlag, Berlin, 2001, pp. x + 228. ISBN 3-540-41138-0; GB£ 14.00, US\$ 19.95, DM 34.90, 151 FF**

It is said that 10% of the rules of organic chemical nomenclature are needed to name 90% of organic compounds. This book covers far more than 10% but manages in a relatively small volume to deal with most areas that the average chemist is going to need. It is an English version of Professor Hellwinkel's well known book in German on the subject, now in its fourth edition. As one involved for many years in the development of IUPAC nomenclature, the author is in a good position to summarise the rules.

The book begins by considering the various types of parent structure—acyclic and cyclic hydrocarbons, heterocyclic ring systems and cyclophanes. Although basically describing IUPAC nomenclature, where appropriate differences between this and Chemical Abstracts Service nomenclature is indicated. Some of the recent developments in nomenclature are also described, such as the extension of cyclophane nomenclature tophanes (chains which include cyclic components).

Several different nomenclature systems are summarised, with the emphasis on substitutive nomenclature but noting how other systems are needed for some situations. The author has not confined himself just to those systems covered by the published IUPAC rules but also points out, with examples, how the rules can be extended.

Having set the scene, the nomenclature of the traditional functional groups of organic chemistry is considered. This covers the usual groups, involving halogens, nitrogen, oxygen and sulfur. Organoboron compounds and the complexity of the derivatives of the various phosphorus acids are not included. There is a separate chapter on organometallic compounds or, as it is entitled, 'metalorganic and metalloidororganic compounds'. Several systems are covered—substitution of the parent

hydride, coordination nomenclature, anionic derivatives of the metal [e.g. butyl lithium, methylmagnesium iodide or iodo(methyl)magnesium] and 'ate' complexes (e.g. lithium dimethyl cuprate).

A chapter on carbohydrate nomenclature stands out as a useful summary of an area where systematic nomenclature is not applied. Apart from a number of other natural products whose structures are mentioned in the appendixes, this is the only class where the nomenclature is dealt with. The general rules of how to modify a natural product parent name would have been useful.

The last chapter deals with the construction of the names of complex compounds. It covers the selection rules for the parent and its numbering; the order of prefixes, isotopic modification and stereochemistry.

The appendixes list the complete list of 'a'-terms used in replacement nomenclature and 13 tables of various categories of trivially named compounds, mainly natural products. It would have been helpful to indicate which names are approved by IUPAC and which are discouraged. In the 1992 IUPAC rules, trivially named compounds are also categorised into those where unlimited substitution is permitted, those with limited substitution, and those which may only be used for the compound itself.

In summary this is a very useful book with few errors and these should not confuse those with some experience of organic nomenclature. Only occasionally does the German origin show. Compared with other books in this area this has been priced at a level anyone interested can afford. Twenty years ago the fifth edition of R.S. Cahn's book on chemical nomenclature appeared. Hellwinkel's book is a worthy successor for the organic chemist and is to be strongly recommended.

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