

## Book review

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*Carbohydrate Chemistry: Monosaccharides and Their Oligomers:* HASSAN S. EL KHADEM, Academic Press, San Diego, CA, and London, U.K., 1988, x + 251 pages + Subject Index, \$44.95, £31.50.

For a generation, R. D. Guthrie and J. Honeyman's *Introduction to the Chemistry of Carbohydrates* (Clarendon Press, Oxford, 1948, 1964, and 1968) was the standard entry into carbohydrate chemistry for many students. Now, this book is out of date, leaving a gap that needs to be filled. Two contenders have recently appeared: the one reviewed herein and R. W. Binkley's *Modern Carbohydrate Chemistry* (Marcel Dekker, 1987). Both are larger than Guthrie and Honeyman (which is 144 pages long in the 3rd edition), showing the considerable expansion of the subject: El Khadem's by about 100 pages, and Binkley's (at twice the price) by 200 pages. Neither book covers the polysaccharides.

*Carbohydrate Chemistry* is an introductory treatise not aimed at the specialist. It covers the structure, configuration, and conformation of mono- and oligo-saccharides, their nomenclature, physical properties and chemical reactions, and methods of degradation and synthesis. The reactions are discussed in terms of their mechanisms. Two very welcome chapters (unfortunately, not listed in the Table of Contents), new to this kind of book, are on the synthesis of non-carbohydrates from carbohydrate synthons and of carbohydrates from non-carbohydrates. The last chapter, on oligosaccharide syntheses, is on a higher level, and will also be useful to carbohydrate chemists involved in research.

The subtitle *Monosaccharides and Their Oligomers* is to be taken literally, as there is no discussion of the disaccharides. It is odd that, in an introductory text, the structures of sucrose or lactose are not discussed; they are mentioned in the chapters on structure determination and synthesis, but no-one would find them there. Neither sucrose nor lactose appears in the Index; nor do glucose, fructose, glucitol (sorbitol), or ascorbic acid. The Index of 3½ pages is inadequate.

There is a list of recommended review articles for each chapter. Occasionally, references turn up in the text; curiously, these are mostly to papers published in the 70's, rather than in the 80's. There are problems at the end of each chapter; some require knowledge not imparted by this book for their solution, presumably to encourage reading of the review articles.

The reviewer finds some lack of balance between the various subjects treated. He feels that 11 pages on nomenclature is too much in an introductory text. Also, 8 pages on hydrazones and osazones is more than these subjects warrant. There is

only half a page on alditols, and none on inositols. The discussion on modern aspects of n.m.r. spectroscopy is so concise that it will be incomprehensible to those not already familiar with those methods. The reader will, in any case, need to learn his n.m.r. spectroscopy from other texts.

The reviewer would have liked to have seen some discussion on the natural occurrence, isolation, and manufacture of the important carbohydrates, and on their biological, nutritional, and industrial importance; but all this is covered only very briefly (in the Introduction). Isotopically labelled sugars are only mentioned in one of the problems. On the other hand, Tables III and IV, listing the carbohydrates that are commercially available, are very useful. Some indication of the cost of chemical reagents would have been helpful: the prices of carbohydrates listed in these Tables ranges from \$6.50/kg to \$28/g. It may be helpful to realize that ruthenium tetroxide is a very useful reagent but costs \$25/g, whereas the cost of oxygen (an alternative reagent in some cases) is practically negligible.

The nomenclature is correct throughout the book (as Dr. R. S. Tipson read the entire manuscript), the formulae are numerous and clearly drawn, and there are very few errors (the composition of an aqueous solution of D-gulose is wrongly given in Table I; it should be 16:81:0:3).

The price of the book is reasonable. It can be recommended as a college or university textbook, and it may well gain widespread acceptance.

*School of Chemistry  
University of New South Wales  
Kensington, N.S.W. 2033, Australia*

STEPHEN J. ANGYAL