

## Book review

*The Carbohydrates: Chemistry and Biochemistry*, Second Edition, Volume IB, WARD PIGMAN AND DEREK HORTON (Editors), JOSEPH D. WANDER (Assistant Editor), Academic Press, New York, 1980, xxiii + 836 pages + Author and Subject Indexes, \$69.50, £ 45.20.

The four-volume, second edition of "*The Carbohydrates*" has now been completed by publication of the long-awaited Volume IB. Together, Volumes IA (1972) and IB focus, in the main, on the chemistry of monosaccharides and their derivatives. Volume IB contains thirteen chapters, the first eleven of which are concerned with various aspects of carbohydrate reactions. There then follows a chapter on the physical methods used in determination of the structure of carbohydrates. The final chapter is devoted to chromatographic and electrophoretic separation-techniques applicable to carbohydrates and carbohydrate derivatives.

The subject matter in approximately the first half of the book is labelled according to types of carbohydrates. "Amino Sugars" by D. Horton and J. D. Wander, "Deoxy and Branched-Chain Sugars" by N. R. Williams and J. D. Wander, "Thio Sugars and Derivatives" by D. Horton and J. D. Wander, "Unsaturated Sugars" by R. J. Ferrier, "Glycosylamines" by H. Paulsen and K.-W. Pflughaupt, and "Hydrazine Derivatives and Related Compounds" by L. Mester and H. S. El Khadem comprise, in the order of their appearance, the early chapters of this volume. A chapter entitled "Reduction of Carbohydrates", by J. W. Green, is then followed by three chapters whose central theme is carbohydrate oxidations: "Acids and Other Oxidation Products" by O. Theander; "Oxidative Reactions and Degradations" by J. W. Green; and "Glycol-Cleavage Oxidation" by A. S. Perlin. The reaction-chemistry of carbohydrates is rounded out by G. O. Phillips' chapter entitled "The Effects of Radiation on Carbohydrates". The chapter on physical methods is divided into six sections: "High-Resolution Nuclear Magnetic Resonance Spectroscopy" by L. D. Hall; "Mass Spectrometry" by D. C. DeJongh; "Polarimetry" and "X-Ray and Neutron Diffraction" by R. J. Ferrier; "Electronic (Ultraviolet) Spectroscopy" by H. S. El Khadem and F. S. Parker; and "Infrared Spectroscopy" by R. S. Tipson and F. S. Parker. M. I. Horowitz wrote the remaining chapter, "Separation Methods: Chromatography and Electrophoresis".

In general, this volume is comprised of well-written chapters. While not designed to provide comprehensive accounts of the subjects covered, the chapters adequately address the scientific aspects of each subject, and provide references to key publications and review articles. The literature coverage in most chapters extends through 1975-1976, but then tapers off. A number of additional observations may be worth noting. The three oxidation chapters blend together well and cover the oxidation theme rather thoroughly. The chapter on amino sugars is quite extensive and

includes a remarkably long list of references. A description and survey of radiation of carbohydrates is preceded by a concise and clear presentation of the photochemical-excitation process. The high-resolution n.m.r. section, with references as recent as 1980, highlights a range of techniques applicable to carbohydrates, including the use of spin-lattice relaxation-times for configuration and conformation studies. The i.r. spectroscopy section is very thorough and should prove to be of considerable practical benefit to investigators evaluating this spectroscopic characteristic of carbohydrates. In contrast, the important section on mass spectrometry is a little disappointing, due both to its brevity and the paucity of more-recent references. Given the array of separation techniques used in carbohydrate chemistry, readers will be pleased to find, in the final chapter, well-referenced descriptions of all of the main techniques.

In keeping with the established standards of the earlier volumes in this series, the editors have done a good job in removing errors and insuring the clarity of Figures and drawings throughout the volume. Investigators working in the carbohydrate field will certainly want to add this reasonably priced, extremely useful, reference volume to their personal libraries.

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