Carbohydrate Research, 72 (1979) C19–C22

Book reviews

Advances in Carbohydrate Chemistry and Biochemistry: Volume 35, edited by R. STUART TIPSON AND DEREK HORTON, Academic Press, New York, San Francisco, London, 1978, x + 385 pages + Author, Subject, and Cumulative indexes, $53.50.

The relatively large size of one of the review articles in Volume 35 of the *Advances* limited the number of topics discussed in this issue to five plus an obituary. The volume starts with a fitting tribute to the late Sir Edmund L. Hirst, a leader in the British carbohydrate school, written by two of his students, Maurice Stacey and David J. Manners. The article includes a complete chronological listing of his publications.

The first review article, entitled "Carbohydrate Boronates", is authored by Robert J. Ferrier, who was one of the first chemists to use boronic acid esters for synthetic work. The article illustrates several applications of these boronic esters, especially in the preparation of selectively protected carbohydrates and in the separation of these derivatives. It concludes with a description of the fragmentation pathways encountered in the mass spectra of carbohydrate boronates. The chapter includes several useful Tables of the physical constants of sugar boronates.

The next article, by Hans Grisebach, on the biosynthesis of sugar components of antibiotic substances, describes a host of interesting carbohydrate structures encountered in antibiotics. These structures include branched-chain sugars, aminocyclitols, and amino sugars. The interest in this topic is apparent from the large number of review articles that have treated this subject, including two that appeared in earlier issues of the *Advances*.

The major article in the present volume, both in the scope of the review and its size, is entitled "The Lectins: Carbohydrate-binding Proteins of Plants and Animals" and is authored by I. J. Goldstein and C. E. Hayes. This article, of 200-plus pages, discusses research work published in no less than 875 papers. Although the hematological properties of the materials now termed lectins was discovered in the late 1880's, it was only in recent years that the importance of these phytohemagglutinins was discovered. The article starts with a general discussion of the detection, isolation, and specificity of lectins, and is followed by a review of the chemistry of the major types of lectins. The latter include the D-mannose(D-glucose)-binding lectins, the 2-acetamido-2-deoxy-D-glucose-binding lectins, the 2-acetamido-2-deoxy-D-galactose-binding lectins, the D-galactose-binding lectins, and the L-fucose-binding lectins. A group of other lectins is then discussed, and the article concludes with the cell-surface, lectin-reactive glycoproteins in erythrocytes and platelets, lymphocytes, and neuronal and tumor cells. It should be noted that several useful Tables listing the physical and chemical properties of purified lectins are included in the article.

The biochemistry of plant galactomannans is then discussed by P. M. Dey. He describes the occurrence, isolation, structure, and biosynthesis of the various galactomannans, as well as their biochemical degradation.

Volume 35 of the *Advances* concludes with a short bibliography of crystal structures of polysaccharides. This is a continuation of an article that appeared in Volume 33 by R. H. Marchessault and P. R. Sundararajan that covered the literature between 1967 and 1974. The present article, by the same authors, treats the literature that appeared in 1975.

As a whole, Volume 35 of *Advances in Carbohydrate Chemistry and Biochemistry* constitutes a well balanced selection of topics ranging from monosaccharide synthesis and structure to polysaccharides and glycoproteins. As in previous volumes of this series, the articles are well written, and have been able edited by the Tipson–Horton team. The present volume is certainly worthy of the continued support that carbohydrate chemists and biochemists have given to the series. It maintains the high level of excellence to which users of these *Advances* have become accustomed. The volume should be in all chemical libraries, and is essential reading for all those who want to keep abreast of modern trends in carbohydrate chemistry and biochemistry.

Michigan Technological University,
Houghton, Michigan 49931

HASSAN S. EL KHADEM

Carbohydrate Sulfates: edited by RICHARD G. SCHWEIGER, ACS Symposium Series 77, American Chemical Society, Washington, D.C., 1978, ix + 281 pages + Subject Index, $24.00.

The ACS Symposium Series constitutes a valuable source for workers unable to attend symposia in their particular fields, and this volume certainly fulfils this role. Interest in carbohydrate sulfates ranges from sulfates of sugars and sugar derivatives, through commercially important synthetic polysaccharide sulfates, to naturally occurring polysaccharide sulfates of biological interest. Reviews or original studies on each of these aspects are included in this volume, but, with fourteen of the seventeen chapters devoted to aspects of polysaccharide sulfates, there is no doubt where the emphasis lies. Although some attempt has been made to group the chapters so that related aspects occur contiguously, this is partly defeated by the heterogeneous nature and mode of presentation of the papers; a review on enzymic formation and cleavage of sulfuric esters is sandwiched between original papers on the chemical modification of heparin and the synthesis of carrageenan substitutes.

Review chapters cover glucosinolates, synthetic methods in sulfated glycolipids, polysaccharide sulfates of Chlorophyceae and Rhodophyceae, and fucose-containing polymers of brown algae. A comprehensive, but non-selective, review of the enzymic formation and removal of sulfuric ester groups by Whistler *et al.* is a timely contribu-