

The book is a very useful and rare source of information on biological and medical research of hyaluronan. It should be recommended to cell biologists, biochemists and physical chemists, embryologists and developmental biologists, oncologists, pathologists and rheumatologists, but also to students involved in the field.

Eduardo H. Melo
John F. Kennedy

Analysis of Carbohydrates by GLC and MS. Edited by C. J. Biermann and G. D. McGinnis, CRC Press, Boca Raton, Florida, 1989. ix + 292 pp. ISBN 0 8493 6851 0. Price US\$176.00.

The analysis of the monosaccharide residues in carbohydrate containing materials is central to understanding the structure and properties of these materials. With carbohydrate polymers being important as structural components, viscosity modifiers, antigens, informational molecules and chemical messengers, it is important to understand the fine details of structure and how changes in a very limited number of residues can dramatically change the properties or function of the material. In the early 1970s G.G.S. Dutton published two reviews in *Advances in Carbohydrate Chemistry* and *Biochemistry* which provided the GC chromatographic data on a wide range of monosaccharide derivatives. In the ensuing 15 years the number of monosaccharides which have been discovered has been considerable, with new deoxysugars, aminosugars, aminouronic acids and branched-chain monosaccharides being found in antibiotics and bacterial polysaccharides, and the need for an up-to-date reference text was overdue.

This volume provides a compilation of the methods of derivatization available and the optimum columns and chromatographic conditions, but each chapter also contains a discussion on the relative merits of the various conditions etc. together with information useful to the practising analyst and examples of separations from a broad spectrum of subject areas. The discussion on hydrolysis and other glycosidic linkage/cleavage methods is very useful with comparisons of the various methods and the degree of decomposition of the monosaccharide residues which can be expected. Such aspects are frequently omitted when carbohydrate analyses are performed.

The extension of GLC into GC-MS shows how the technique can be used to provide information on linkage and structure of carbohydrates. The more recent improvements in instrumentation has made this a technique available to a majority of laboratories and the practical information provided is valuable to those new to the technique. The development of techniques such as fast atom bombardment-mass spectrometry shows how technology is overcoming problems frequently encountered in carbohydrate analysis, namely non-volatile samples and labile compounds, and allowing information on structure and branching in polysaccharides and the presence of noncarbohydrate components (amino acids, substituents, etc.) to be obtained

The inclusion of a chapter on high performance liquid chromatography may at first appear to be out of place, but the advantages this technique offers for some types of analysis should ensure that analysts consider the two techniques as complimentary.

This is an excellent volume which should be found in the laboratory of all carbohydrate analysts.

John F. Kennedy
Charles A. White