

Book reviews

***Specialist Periodical Reports: Carbohydrate Chemistry*; Vol. 29; R.J. Ferrier (Ed.); xvii + 438 pages, ISBN 0-85404-213-X, £170.00**

Historically, the Royal Society of Chemistry has published *Specialist Periodical Reports* since 1967. Volume 29 of the carbohydrate chemistry series, reviews the literature that was published in 1995, which relates specifically to monosaccharides, disaccharides and certain specific oligosaccharides.

The book consists of 24 chapters that can be divided roughly into four sections. After a brief introduction, the book examines the published literature detailing the various synthetic, enzymatic and chemoenzymatic methods used to prepare monosaccharides, disaccharides (including glycosides) and various oligosaccharides. Glycosyl halides are of immense value in glycoside synthesis, and fluorides are now commonly used.

The second part of the book is devoted to carbohydrate derivatives, this is also by far the largest section of the book (sixteen chapters are included in this section). In aqueous solution Pb^{2+} ions have been found to form complexes with D-talopyranose and D-talofuranose, whereas Hg^{2+} ions do not. Section 3 also includes a review of the literature regarding inorganic derivatives.

A number of ureido sugar derivatives have been examined by 1H , ^{13}C and ^{15}N NMR spectroscopy. The data indicates that replacement of one amino acid residue by another has no significant effect on the conformation of the glucopyranose moiety. The literature covering the techniques employed in the analysis of carbohydrates is detailed in section three, where special emphasis has been given to NMR spectroscopy.

The book concludes with a review of the published literature concerning synthesis of enantiomerically pure non-carbohydrate compounds.

Overall this is an extremely detailed and informative volume, that will be a valuable reference point of access to primary literature for those scientists involved in the field of carbohydrate research.

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***Functional Properties of Food Macromolecules*; S.E. Hill, E.A. Ledward, J.R. Mitchell (Eds.); Aspen Publishers, Gaithersburg; 2nd edition; 1998, xvi + 348 pages, ISBN 0-7517-0421-7, US\$ 176.00**

Food technologists need to understand the underlying science behind the behaviour of individual and combined ingredients in formulated food products. Research into the interactions between macromolecules and water and the solution properties of food biopolymers in recent years has resulted in significant advances in the understanding of such phenomena, which are fundamental to our comprehension of the functional properties of food macromolecules. The first two chapters in this volume are therefore concerned with such important aspects and cover dilute solution viscometry of food biopolymers, and water and food macromolecules, respectively.

The most important feature of proteins and polysaccharides is their ability to dictate or modify the structure of a food and therefore be largely responsible for the perceived texture or 'mouthfeel'. Under appropriate conditions many polysaccharides and proteins associate, resulting in gelation at high water levels. Knowledge of the gelation behaviour of both polysaccharides and proteins continues to advance and is discussed in chapters covering the gelation of globular proteins, and the gelation of polysaccharides, respectively. Gelation behaviour is primarily concerned with high water systems, which are relevant to some food systems. Inclusion of a chapter covering the structural properties of high solids biopolymer systems therefore aims to complete the overall picture. Protein–polysaccharide interactions have been the subject of the most research in the food biopolymer area in recent years and a chapter is devoted to the functional properties of protein-polysaccharide mixtures.

A major development in food science since the first edition of this book is the growing interest in the use of high pressure to preserve and process a range of foods. Such techniques are detailed in this volume and are also of interest with respect to colloid science because of their potential for the manipulation of functional properties of biopolymers, especially proteins, in an environmentally friendly way. A chapter detailing the complex phenomena of emulsions and foams has been expanded and developed since the first edition.

This volume covers a range of interrelated functional properties that are of central importance in food product development. It does not attempt to cover all aspects of biopolymer functionality, but concentrates on areas where

a better understanding of phenomena at the molecular level would improve our ability to develop new products and the quality of existing ones.

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for all individuals involved in any research requiring the characterisation of organic compounds and hence the interpretation of spectroscopic data.

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***Spectroscopic Methods in Organic Chemistry*; M. Hesse, H. Meier, B. Zeeh (Translated by A. Linden and M. Murray); George Thieme Verlag, Stuttgart, 1997, viii + 365 pages, ISBN 3-13-106061-1, DM 168.00**

The development of spectroscopic methods facilitated elucidation of functional groups, and in some cases complete structures, of previously unknown materials, and replaced many of the laborious analysis of degradation products techniques employed previously. This comprehensive volume is part of the *Foundations of Organic Chemistry Series* and is a translation of the fifth German edition. Each new edition is thoroughly updated so that it describes the current state of the art in spectroscopic methods. It is divided into five large chapters that detail UV–Vis spectroscopy, infrared and Raman spectroscopy, nuclear magnetic resonance spectroscopy, mass spectra, and combined examples, respectively.

Individual chapters are well structured and provide a good balance of fundamental principles, practical information (sample preparation and instrumentation information) and detailed information on the spectral features of functional groups. All chapters are subdivided into relevant sections, e.g. the chapter covering UV–Vis spectroscopy is divided into sections covering; theoretical introduction, sample preparation and measurement of spectra, chromophores, applications of UV–Vis spectroscopy, derivative spectroscopy, and chiroptical methods. This volume contains over 200 figures and 100 tables, the latter of which provide a wealth of information regarding observed signals from specific functional groups and hence are invaluable with respect to spectral interpretation.

Spectroscopic Methods in Organic Chemistry is designed to be a supplementary textbook and aims to provide the reader with comprehensive knowledge of such spectroscopic techniques and particularly to address the way one should approach the analysis of unknown compounds using such techniques. It contains an abundance of extremely useful information and is therefore highly recommended

***Polymer Synthesis and Characterization: A Laboratory Manual*; S.R. Sandler, W. Karo, J.-A. Bonesteel, E.M. Pearce (Eds.); San Diego: Academic Press, 1998, xvii + 212 pages, ISBN 0-12-618240-X, \$39.95**

Polymer science is an extremely important and vast area of scientific interest. This laboratory manual provides a comprehensive introduction to an array of important techniques that are representative of a wide variety of polymerisation and characterisation methods. The experiments are designed to be completed in one laboratory period, using limited quantities of materials to reduce costs and disposal problems, and were reviewed for classroom use at undergraduate level.

The manual is divided into two large sections, namely, polymer synthesis and polymer characterisation. The polymer synthesis section is further divided into six subsections that cover the polymerisation of styrene, acrylic esters, polyamides, polyesters, epoxy resins and vinyl acetate, respectively. The majority of these subsections contain more than one experimental protocol, giving a total of 12 protocols in the polymer synthesis section. The polymer characterisation section contains 11 detailed experimental protocols that cover a broad range of analytical and instrumental techniques. Techniques covered include nuclear magnetic resonance (NMR), infrared (IR) spectroscopy, thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), dilute solution viscosity, gel permeation chromatography (GPC), light scattering, end group analysis, X-ray diffraction, optical microscopy and dynamic mechanical analysis (DMA). Many of the analytical techniques discussed can also be applied to the characterisation of natural polymers.

This volume combines the extensive industrial and teaching experience of the authors and introduces the user to the concept of “Good Manufacturing Practice”. Numerous references are included throughout for more advanced students, technicians and researchers. It is assumed that the reader is already familiar with the basics of organic chemistry and has some knowledge of the mechanisms of