

Technical developments in nuclear magnetic resonance, X-ray diffraction and computer modelling methods have made the greatest contribution to the structure determination and understanding of the conformations of carbohydrates.

“Conformation of Carbohydrates” compiles this structural knowledge and offers a firm understanding of all aspects of carbohydrate conformation by describing and explaining the importance of interactions between carbohydrates, as well as interactions of carbohydrates with proteins, nucleic acids or any other macromolecule. A basic knowledge of the chemical structure of carbohydrates is essential for the development of conformational analysis and visualisation of the geometries of complex carbohydrates. Therefore, the first chapter “Configuration of monosaccharides”, backed by schematic diagrams that reinforce the material discussed, is devoted to this topic. In “Methods of conformational analysis” experimental methods are outlined briefly before embarking on a discussion of the computational methods. In addition to describing the conformation of monosaccharides, disaccharides and oligosaccharides extensively, the chain conformations of some selected homopolysaccharides in crystalline state as well as randomly coiled polysaccharides are also provided. Fibre diffraction studies, together with molecular modelling, have led to the determination of the morphologies of a wide variety of right and left-handed, fully extended and wide cylindrical, single and multistranded polysaccharide helices. Therefore, a chapter is devoted to important details on the basic principles of fibre diffraction, generation of molecular and packing models of helices and subsequent refinement of structures by the least-squares methods. The book also features structures of more complex polysaccharides such as “Carrageenan”, “Hyaluronan”, “Sulfated glycosaminoglycans” and “Polysaccharides with large repeating units” as well as “Peptidoglycans”. A richly illustrated chapter on carbohydrate–protein interactions dealing with more complex X-ray structure data of carbohydrates–protein complexes completes the book.

“Conformation of Carbohydrates”, supported by extensive literature references, is a “one-stop” source of current information of carbohydrate conformation and the potential use of conformational properties in industry and also of their crucial role in important biological events such as cell–cell interaction, cell-adhesion, and cellular signalling mechanisms. It is, therefore, a valuable source for students, teachers and research scientists interested in carbohydrate structures.

John F. Kennedy
Mercedes Garaita

*Birmingham Carbohydrate and Protein Technology Group,
University of Birmingham, Birmingham B15 2TT, UK
E-mail address: jfkennedy@chemistry.bham.ac.uk*

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Metabolic Pathways of Agrochemicals

Parts 1 & 2; Terry Roberts & David Hutson (Eds.); ISBN 0-85404-489-2

The pursuit of agriculture has been profitable from time immemorial, but currently there is a large drive to make even better and wider use of crops particularly for non-food uses. Indeed much funding has been directed at this by the EU and individual member state government departments. Add to this the current interest and debate over genetically modified crops and the ongoing concern regarding the toxicity of plant treatment products both to man and animals, together with the resistance to pesticides manifestly developed by some pests, new ideas on soil decontamination and regeneration and there you have a field ripe for scientific assessment as to what happens in real life with agrochemicals.

These important new volumes provide a comprehensive summary of data and information on the metabolism and chemical degradation of agrochemicals in soils, plants and animals. Part 1, Herbicides and Plant Growth Regulation, provides information on over 170 chemicals, as well as important research on sulfonyl ureas and imidazolines. Part 2, Insecticides and Fungicides, provides information on over 250 chemicals, as well as previously unpublished information by Agrochemical companies. The second volume also includes information on nematicides, rodenticides, insect growth modulators and plant activators.

The contents of the two books include metabolic pathways, mechanisms and products, as well as information on physico and chemical properties and mode of action. Knowledge of the metabolism of herbicides, their selectivity and mode of action are invaluable to biochemists and synthetic chemists. The metabolism of insecticides and other agrochemicals also gives information on the mechanisms of toxicology.

Both volumes of comprehensive reference source are designed to provide easy access to information on the degradation and metabolism of all the major classes of agrochemicals in use. The books are comprised of the following: separate entries for each pesticide; overviews of the metabolism of specific classes of agrochemicals; similarities and differences between chemicals in each class; an extensive bibliography (as each reference is fully referenced); and finally, comprehensive, high quality indexes. Included in the indexes are the chemical/common names, CAS Registry Number, and reaction type.

These two new publications are organised systematically, and are very readable. A structural approach is taken, and over 40 years of literature is covered in these very detailed volumes, as well as unpublished works. *Metabolic Pathways of Agrochemicals* is compiled by a highly respected team of international editors, and is a comprehensive reference source for chemists, biochemists and biologists working in the discovery, development and registration of

agrochemicals. It is also useful for scientists in related areas such as design and mode of action of pharmaceuticals.

J.F. Kennedy
N. Turan

*Birmingham Carbohydrate and Protein
Technology Group, School of Chemistry,
The University of Birmingham,
Birmingham B15 2TT, UK*

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Organic Coatings: Science and Technology

2nd ed.; Z.W. Wicks, Jr., F.N. Jones, S.P. Pappas; Wiley, New York, 1999, 630 pages, ISBN 0-471-24507-0, £80.95

Coatings are everywhere: in the home, they are on walls, furniture, white goods and on printed circuit boards in many electrical appliances, while outside the home they are on houses and cars. The functional and aesthetic requirements of coatings are extremely broad, reflected in the diverse science and technology which supports their development, production and use. Coating technology evolved empirically, but recent decades have seen a marked increase in the scientific understanding of the underlying principles. The modern need to develop, maintain and improve coating performance still demands the understanding of complexities present in the formulation process, which are often overlooked. The quality of literature in the coatings field is very variable, so that there was a need for an authoritative 'one-stop' publication that would help scientists, engineers and coatings formulators understand the principles underlying the technology, and to utilise them effectively.

Organic Coatings: Science and Technology, Second Edition: provides a structured and systematic, up-to-date account of the technology and principles underlying the production and use of organic coatings. Completely updated and rewritten in a single volume since the *First Edition*, this book introduces readers to the subject with seven chapters on key properties of coatings. Subsequent chapters describe raw materials, physical concepts, formulations, applications and properties. Coatings industry terminology is carefully defined to help newcomers to the field understand esoteric coatings jargon. Practical troubleshooting advice for scientists and technologists in all branches of the industry is prominently featured. There are comprehensive sets of references in each chapter, as well as an appendix listing useful information sources including electronic ones such as the Internet, WWW and proprietary databases.

The book provides an up-to-date, clearly written and presented compendium, equally of value as a textbook or as an essential reference tool. It is highly recommended for scientists in all branches of the coatings industry, but much

of the material will be of value to workers in related areas of adhesives, plastics and printing ink industries.

J.F. Kennedy*
M. Thorley

*Birmingham Carbohydrate & Protein Technology Group,
School of Chemistry, The University of Birmingham,
Edgbaston,
Birmingham B15 2TT, UK*

E-mail address: jfkennedy@chemistry.bham.ac.uk

*Corresponding author. Tel.: +44-121-414-7029;
fax: +44-121-414-7030.

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Molecular Modeling on the PC

M.F. Schlecht; Wiley, Chichester, 1998, xviii + 763 pp., £80.95. ISBN 0-471-18567-1

A dramatic increase in the use of PC's in the home and for teaching in schools, colleges and universities has led to the development of numerous readily available software packages that allow users to perform sophisticated mathematical data manipulations. Inexpensive PC's equipped with a satisfactory software package allow individuals with basic PC literacy to perform molecular modelling and carry out molecular structure calculations. The number of molecular modelling techniques is ever increasing, however they all fall into three categories, namely ab initio methods, semiempirical methods, and empirical force field methods.

This volume deals exclusively with empirical force field methodologies and is aimed at individuals with little or no experience in the field. In-depth coverage of the key terms, hardware and software, and basic modelling strategies utilised in the field are provided. Using a problem-solving approach and using the popular PCMODEL[®] program, readers are guided through an array of powerful techniques. Tested examples and skill-building exercises are provided throughout, along with numerous illustrations and figures that clarify important points. Detailed appendices and a comprehensive list of references are also provided, along with a diskette that contains a structure input file library with structure files for the PCMODEL[®] experiments, template files for rapid structure building, and a hypertext directory of molecular modelling web sites and resources.

Exercises presented cover several key areas. Simple model building exercises are aimed at generating 3-D structures that approximate the shape and relative geometries of particular molecules. Discovering the lowest energy conformation, or group of conformations, for a flexible molecule, with a quantitative energy ranking is also presented. Results