

a result of press and media coverage of the importance of a healthy diet and the possibility of harmful effects of additives used in the food industry.

This book not only informs the reader about the molecular structure of the components of food, but also attempts to explain the chemical changes that take place during food handling and processing. The major dietary components, such as carbohydrates (mono-, oligo- and polysaccharides), lipids and proteins are described in some detail in Chapters 1–5, followed by colours, flavours, vitamins, minerals and water in subsequent chapters. The much publicised E-numbers are dealt with in a chapter on preservatives and even less attractive components such as agricultural residues are considered in a chapter on 'undesirables'. Throughout the book, the aim is not only to discuss what food is made of but also to try to explain how it 'behaves'. The author is at pains to point out the interdisciplinary nature of the material, making excursions into topics from physics to biology as required. Chemical structures are presented simply and systematically using neat, clear diagrams. The book is pitched at a standard that is easily accessible to science undergraduates and, although it is obviously designed to form the basis of an undergraduate course in food chemistry, at £14.50 it would be an interesting addition to the bookshelf of anyone with a scientific background and a desire to learn about the structure of food components and the chemistry of cooking.

Emma J. Place
John F. Kennedy

Nuclear Magnetic Resonance: Concepts and Methods. D. Canet (ed.), John Wiley and Sons, Chichester, UK, 1996, x + 260 pp., price £55.00, ISBN 0-471-94234-0

Nuclear magnetic resonance spectroscopy (NMR) is one of the most powerful analytical techniques known to scientists. Like other forms of spectroscopy, for instance, infrared and ultraviolet, NMR deals with the measurement of energy gaps between states of different energy. However, unlike most other forms of spectroscopy, the phenomenon requires the presence of an external magnetic field and concerns nuclei rather than electrons. At present, NMR is the most powerful technique for structural analysis because it defines the environment of all occurring functional groups, as well as of fragments such as hydrogen atoms attached to carbon. In addition, it is a non-destructive method. Therefore, the analysed samples can be reused. NMR may also be utilised for quantitative determination even though its sensitivity, compared with optical techniques, gas chromatography, and mass spectrometry, is lower.

This book is the English translation of the original book which was written in French in 1990–1991. The

opening chapter presents an overview of the important concepts of NMR. It includes the basic approach to the interpretation of common NMR spectra in the liquid state and in the anisotropic medium. It also involves the advanced mathematics and quantum mechanics (Fourier transformation, product-operator formalism, signal processing techniques, etc.). It explains some concepts of spin relaxation which deal with spin dynamics in relation to molecular motions including rotational and translational motions in a more general way. The final chapter is a survey of the major multipulse and multidimensional methods of present day NMR including selective excitation, correlation spectroscopies and NMR imaging.

This is a very educational and comprehensive book providing many aspects of NMR and a detailed insight into the new area of the analytical techniques. Therefore, it is suitable for advanced undergraduate level in most fields of science, including chemistry, physics, biology, biomedicine, surface science and environmental analysis.

Pawadee Methacanon
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Carbohydrate Chemistry for Food Scientists. Roy L. Whistler and James N. BeMiller (eds.), Eagan Press, St. Paul, MN, USA, 1997, 241 pp, price \$114.00, ISBN 0-913250-92-9

Food scientists and engineers deal more with carbohydrates than with other food ingredients because of their abundance, low price, food value, and excellent ability to control the physical properties of foods. They are amenable to both chemical and biochemical modification and both modifications are employed industrially to improve their properties and extend their use.

"*Carbohydrate Chemistry for Food Scientists*" deals with the chemistry and functionality of carbohydrates in natural foods, food product formulations, and food processing, storage and preparation. Chemical and physiochemical properties of natural and modified carbohydrates of all sizes are extensively treated. Explanations of how industry professionals apply this knowledge to the properties and use of carbohydrate ingredients are also included.

Information is also provided on the biochemistry and metabolism of carbohydrates to give an understanding of caries formation, of carbohydrate digestion and of other changes in carbohydrates as they pass through the human gastrointestinal tract. The physiological and nutrition aspects of carbohydrates are also treated.

"*Carbohydrate Chemistry for Food Scientists*", an introduction to the basis of carbohydrate chemistry in food science, is an easy-to-read guide for advanced students or for food scientists and engineers. Complex

topics are clearly illustrated by ample use of structures and diagrams. Information is extensively cross-referenced to show the interrelationship of important concepts.

**Mercedes Garaita
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Application of Chitin and Chitosan. Mattheus F.A. Goosen (ed.), Basel, Switzerland, 1997, Technomic Publishing AG, xi + 336 pp., Sfr. 314.00, ISBN 1-56676-449-1.

Chitin and its derivative chitosan, the second most abundant polysaccharide, occur mainly in the exoskeleton of crustaceans, insects and in the cell walls of some microorganisms. With better understanding of the structure and properties of chitin and chitosan, substantial progress has been made over the years on their functionality and applications especially in biotechnological and medical areas.

"Application of Chitin and Chitosan" examines the state-of-the-art of new as well as potential products. Written by various experts, this book has been designed for an audience of diverse background with interest in the application areas. Research students and scientists as well as industrial people would find this a fascinating insight into the subject matter.

"Application of Chitin and Chitosan" is divided into six parts beginning with two comprehensive chapters which make up the overview and four chapters covering structure and properties. Further chapters on applications have been broken down into four sections according to their application areas i.e. food and agriculture, medicine and biotechnology, textiles and polymer and waste-water treatment.

As in many other multi-authored books, overlapping and inconsistencies in the style of writing and depth of discussion have not been avoided. The chapter on 'characterization and solution properties' was very specific and was written in a formal research report format whilst the chapters on 'chitin structure and activity of chitin-specific enzymes and inhibition of molting in chewing insect pest' were rather brief. Despite that, *"Application of Chitin and Chitosan"* is an excellent review of the new as well as potential applications and would be invaluable to students, academic and industrial scientists.

**F.A. Putri
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Trends in Carbohydrate Chemistry – Volume 2. P.L. Soni (ed.), Surya International Publications, Dehra Dun, India, 1996, 139 pp., ISBN 81-85276-57-9

Being a tropical and a large country, India has a great potential of biopolymer resource derived from various types of plants. Hence, a better understanding of the latest technology of carbohydrate chemistry will definitely boost the agricultural and industrial sectors for the benefit of mankind. Therefore, the proceedings of any conference in the form of a book would facilitate the dissemination of knowledge and help the technologists to build up on the scientific know-how into accepting new ideas and methodologies.

"Trends in Carbohydrate Chemistry – Volume 2" is merely a collection of papers presented during Xth Carbohydrate Conference which was held in Gujarat, India. Unfortunately the topics are not organised systematically for the benefit and convenience of the readers searching for their own desired area of interest. The 14 topics are probably aimed at covering the main area of carbohydrate chemistry carried out in various universities and research institutions of India and focussed the ones which have commercial and industrial values.

However, the papers are relatively simple and very informative. Since natural polymers are becoming popular, both the chemical and physical understanding of these biopolymers are essential for the commercial and industrial communities as well as to the researchers in the area of carbohydrate chemistry in order to optimise the usage of biopolymers and to produce higher value-added products. Topics on natural and modified gum products are also well covered and elaborated, particularly the seed gums which are obtained from the seed endosperm of leguminous seeds and which have widespread applications in paper, textile, food, cosmetics, petroleum and pharmaceuticals.

Another area which is highlighted in the book is the study on cassava starch and the various applications of starch in its native and modified forms. The properties of the starch derivatives are discussed and the possible new avenues of applications are also presented. With more information in carbohydrate chemistry, the usage of starch is then further expanded to the non-food application such as biodegradable polymers or plastics.

The book will be a supplementary resource for researchers and academicians in carbohydrate chemistry to gain extra input for better understanding and improvement in the teaching and R & D aspects.

**John F. Kennedy
W.H. Wan Hassan**

Food Colloids, Proteins, Lipids and Polysaccharides. E. Dickinson and B. Bergenstahl (eds.), Royal Society of Chemistry, Birmingham, UK, 1997, x + 401 pp., price £89.50, ISBN 0-85404-776-X