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Book reviews

Lindhorst, T. K., Essentials of carbohydrate chemistry and biochemistry (3rd ed.), Wiley-VCH, Weinheim, Germany, 2007 (xiii + 317 pp., £45.00, ISBN 3-527-31528-4).

Carbohydrates are the most abundant natural products, playing important roles as energy storage molecules and structural building blocks. They also form fundamental constituents of all cell surfaces, where they are involved in cellular recognition processes essential for life. This updated volume provides a succinct introduction to carbohydrate chemistry and biochemistry, covering basic knowledge as well as advanced topics. The first two chapters provide an introduction to carbohydrates, and the structure and nomenclature of saccharides, respectively. Regioselectivity is a prominent problem in carbohydrate chemistry as sugars contain several hydroxyl groups of different reactivity together with various other functionalities such as carbonyl and amino groups. Protecting groups and protecting group strategies are therefore of crucial importance, and are discussed in the third chapter, along with orthogonally protected carbohydrate scaffolds.

Another important part of carbohydrate chemistry is the functionalisation and modification of the sugar ring. This involves deoxygenation, epimerisation, introduction of double bonds or other functional groups or substituents, and hydroxyl group modification. All of the modifications discussed in the fourth chapter are found in nature in many substances with biological activity and pharmacological relevance. The synthesis of glycosides is of enormous importance in carbohydrate chemistry and biochemistry as a large class of molecules with manifold biological activities can be obtained. O-Glycoside synthesis is discussed in the fifth chapter of this volume. The sixth chapter deals with the structure and biosynthesis of glycoconjugates, covering the diversity and structure of oligosaccharides, N-glycans, O-glycans, mucins, and lipopolysaccharides.

Glycobiology deals with the functions of sugars in biological recognition events, cell adhesion, and cell communication. Besides distinct glycoconjugates involved in such processes, it is also the macromolecular system, called the 'glycocalyx', which is the focus of glycobiological research. Glycobiology, the glycocalyx, carbohydrate microarrays, glycomimetics, and glycomics are discussed in chapter 7. The penultimate chapter of this volume concerns the purification and analysis of carbohydrates, providing a brief overview of chromatography, polarimetry, NMR spectroscopy, and mass spectrometry. The final chapter provides information on the literature of carbohydrate chemistry, introducing the most notable journals, book series, and review articles in the field.

This 'third edition' has been substantially expanded and improved including graphical and mechanistic details as well as recent approaches and references to the modern glycoscience literature. Many practical aspects, including a number of experimental procedures, have been included in this volume, and each chapter concludes with some problems and exercises for the

reader. In conclusion, this informative volume provides an excellent introduction to the basic essentials of carbohydrate chemistry, and this edition also provides information on more advanced areas of current interest, and is therefore highly recommended to all individuals wanting a concise introduction to this interesting and constantly expanding area.

Charles J. Knill
John F. Kennedy*

*Advanced Science & Technology Ltd, 5, The Croft, Buntsford Drive,
Stoke Heath, Bromsgrove, Worcestershire B60 4JE, UK
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* Corresponding author.

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Peter A. Williams, Glyn O. Phillips (Eds.), Gums and stabilisers for the food industry 14, The Royal Society of Chemistry, Cambridge, UK, 2008 (xiv + 584 pp., £99.95, ISBN: 0-85404-461-0).

Nowadays gums and food stabilisers are omnipresent additives in the food and non-food industries. Therefore it is advisable to become well acquainted with the field of hydrocolloids, the group that gums and stabilisers belong to. One way to do this is to read this volume, which describes the latest advances in the technology and science of hydrocolloids presented at the annual 'Gums and Stabilisers for the Food Industry' Conference held at the North East Wales Institute, Wrexham, UK. The volume is divided into seven main sections. All together they focus on such topics as hydrocolloids and health, progress in characterisation, hydration and rheological properties of hydrocolloids, their emulsifiers, interactions in mixed hydrocolloids systems, sensory-texture relationships, and finally innovative applications.

The book begins with an introduction discussing natural polysaccharide systems such as gum Arabic, sugar beet pectin and gum Ghatti. They are all undoubtedly effective in promoting a healthy life style, however they suffer from considerable batch-to-batch structural variability, and there is a need to enhance their performance without chemical modification. The first section broadly describes novel hydrocolloid functionality, discussing hydrocolloid concentration, polymeric solutions and swollen particles such as starch, plant cells or particles produced from gelling hydrocolloids. This section also includes information about visualisation of hydration and swelling, swelling of calcium pectin gel beads, processing-structure property relationship, rennet-induced gelation of milk in the presence of pectin, gel temperature of pectin and much more. The second section describes the relationship between the texture of hydrocolloids and its impact on flavour. Then the book focuses on hydrocolloid

emulsifiers, including gelatine, hydroxypropyl cellulose, mannans, xylans and sugar beet pectin. The next section deals with using hydrocolloids to reduce body mass because they increase the viscosity of intestinal contents, delay gastric emptying and induce production of satiety hormone. The fifth section explains the interactions in mixed hydrocolloid systems, which are mainly based on those already well known, to obtain new systems with a specific set of properties. The innovative applications of hydrocolloids as well as developments in characterisation are presented in the last two sections.

In summary, this volume covers the latest research in the field of hydrocolloids used in the food industry, ranging from their functionality, perceiving the taste and structure, emulsifiers, their

applications in health issues, to mixed hydrocolloids systems and the newest, innovative usage. Therefore, this book is recommended for professionals using hydrocolloids, especially those involved with the science of food.

Agnieszka Fráckowiak

John F. Kennedy

*Advanced Science & Technology Ltd, 5, The Croft, Buntsford Drive,
Stoke Heath, Bromsgrove, Worcestershire, B60 4JE, UK*

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