

Book reviews

Carbohydrates as Organic Raw Materials II. Edited by G. Descotes, VCit Publisher, 1993. vi + 278 pp. Price £61.00. ISBN 3-527-3007-4 (VCH, Weinheim); ISBN 1-560817-703-8 (VCH, New York).

The field of various aspects in carbohydrates has seen many advances in the last few decades. The interest of using carbohydrates as organic raw materials is certainly not surprising considering the importance of carbohydrates in most aspects of our environment. It is only in the last few decades that the significance and application of carbohydrates in industry have been truly recognised. Carbohydrates have been identified for their role as structural materials and primary sources of food. Expansion of knowledge in carbohydrate chemistry provides better prospects for this renewable raw material to be utilised as a starting material in industry.

Due to great effort and interest in searching for new environmentally friendly products, the workshop on which this book is based was organised to provide another platform for the industrial community. Experts from academia and research institutions jointly contributed to discussions on exploiting various sources of carbohydrates as starting materials in various aspects of chemical, biochemical, pharmaceutical and food industries.

Basically the book is divided into two sections: 'Fine chemicals from carbohydrates: synthesis and methodologies' and 'Polymers, detergents and food additives derived from carbohydrates: preparations and applications'. The presentations in the first section give an insight into the syntheses and methodologies of value added products from abundantly renewable carbohydrates. The first paper in this part provides the readers with the whole scheme of possibility for utilising transition-metal catalysts for the homogenous hydrogenation of carbohydrate C–C bonds. The whole idea in this work is to design a catalyst system for the production of more complex, value-added compounds from the vast quantity of renewable organic raw materials. However, the second paper on 'Erythritol, a new sweetener' is merely a general account of this product instead of illustrating in detail the production and synthesis mechanisms of this polyol (which is stated as the main theme in the first section).

The following three papers are quite interesting in the way that the chemical reactions are sufficiently illustrated. The work on C-4 and C-5 chiral building blocks derived from carbohydrates exploited and readily avail-

able L-erythrose and L-ribulose; plus erythritol, ribitol and xylitol derived substrates as the starting materials for downstream processing. Another exploitation of carbohydrates as a source of raw materials is the utilisation of disaccharides particularly D-sucrose, D-lactose, D-maltose and D-isomaltulose. This paper describes some novel, practical, large-scale adaptable reaction channels from bulk disaccharides to versatile building blocks.

Reading through the second section of the book is more stimulating since coloured-graphic figures are presented in the paper on 'Sucrose derivatives as bleaching boosters'. The other papers mainly describe the production of surfactants from carbohydrates. The last paper is quite unique as it describes the application of carbohydrate derivatives as food additives by using twin-screw extruders.

Overall this book is a handy reference to the industrial community and researchers from both the academic and research institutions, particularly to those who are working with carbohydrates. It can be used as one of the mechanisms for promoting and consolidating research and development in the new and challenging area of the utilisation of carbohydrates as starting materials in various industries.

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Taste Chemistry. Edited by R.S. Shallenberger, Blackie Academic and Professional, London, 1993. xxiii + 613 pp. Price £125.00. ISBN 0-7514-0150-1.

Taste is the most easily accessible chemical structure-biological activity relationship, and taste chemistry studies, i.e. the chemistry of sweetness, saltiness, sourness and bitterness have applications in general biology, physiology and pharmacology. Taste is elicited by water soluble materials that interact with receptors on the tongue and in the oral cavity. Due to economic and other factors the majority of the scientific studies in this area are concerned with sweetness.

The aim of this volume is to examine, and elaborate on the meaning of the established premise that 'taste is a chemical sense'. Major effort is directed toward the degree to which chemical principles apply to phenomena associated with the inductive (recognition) phase of taste. Through this approach it is possible to describe the structure and properties of compounds with varying

taste that allow decisions to be made with respect to the probable nature of the recognition chemistry for the different tastes, and the probable nature of the receptor(s) for those tastes.

The initial section defines taste and gives a detailed account of taste receptors on the tongue and the effect of taste blocking (e.g. the action of certain sweetness suppressants such as indoleacetic acid and α -naphthyl sulphate). Taste measurement and an overview of chemical tastes is also discussed. Other topics include discussions on taste chemistry principles, water and inorganic compounds, and the structure and properties of sugars.

A number of sections are devoted to specific groups of chemicals such as polyhydroxy alcohols and cyclitols, amino acids, peptides and proteins and other organic compounds. There is an attempt to identify the common saporous units for taste. Since taste is due to chemical reactions, substances that taste sweet, salty, bitter or sour have different saporous groups that lead to characteristically different reactions.

Overall this is a well presented and extremely informative volume. All sections in the text are identified with a number code for cross-reference purposes. There is also an author and subject index and a glossary, making information retrieval easy. It is therefore thoroughly recommended to anyone within the food industry or within academia who has any interest in this particular area of science.

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Sugars and Sweeteners. Edited by N. Kretchmer and C.B. Hollenbeck, CRC Press, Boca Raton, 1994. x + 297 pp. Price £58.00. ISBN 0-8493-8835-1.

At the present moment the future of sucrose is complicated by substitutes, subsidies and claims that it is deleterious to health. Strong interest continues in developing new non-nutritive sweeteners, reduced calorie sweeteners and more recently, reduced calorie fat replacements. A major driving force for this interest is a change in perceptions about diet and health and preventing disease.

'*Sugars and Sweeteners*' discusses various aspects of the chemistry and metabolisms of mono- and disaccharides, sugar alcohols and synthetic sweeteners. The opening chapter, by N. Kretchmer, outlines briefly the history of sugar (sucrose), its origins and influences. The following 13 chapters bring together information on sugars in diabetic diet; obesity, clinical aspects of sucrose; metabolism of fructose/sucrose; sugars and hyperactivity; the metabolism of aspartame and its effects on the central nervous system; dental effects of sugars and sweeteners; metabolism of cyclamate; and saccharin. The last chapter covers the regulation of non-nutritive sweeteners and sugar substitutes.

This book provides useful information for the study of sugars and sweeteners and is recommended for specialists in food technology, as well as dieticians and researchers working in this field.

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