

Reviews

Developments in Sweeteners—2. Edited by T. H. Grenby, K. J. Parker and M. G. Lindley. Elsevier Applied Science Publishers Ltd, London, 1983. 254 pp. Price: £28.00.

This important book is designed to update the information in *Developments in Sweeteners—1* (edited by C. A. M. Hough, K. J. Parker and A. J. Vlitos) and to concentrate on the properties of different kinds of sweeteners in order to identify the purposes for which they are particularly suitable. It contains chapters on 'Mannitol, Sorbitol and Lycasin: Properties and Food Applications' (Sicard and Leroy), 'Lactose, Hydrolysate Syrups: Physiological and Metabolic Effects' (Williams), 'Nutritive Sucrose Substitutes and Dental Health' (Grenby), 'Medical Importance of Sugars in the Alimentary Tract' (Menzies), 'Recent Developments in Non-Nutritive Sweeteners' (Higginbotham), 'The Toxicology and Safety Evaluation of Non-Nutritive Sweeteners' (Snodin and Daniel), 'The Fate of Non-Nutritive Sweeteners in the Body' (Renwick) and 'Non-Nutritive Sweeteners in Food Systems' (Lindley).

Many of the sweeteners under review have now been permitted for food use in the UK. However, several authors had anticipated this and the developments that they portray will stand as valuable information for many years. The contents of the chapters are divided into metabolic (physiological) and food applications. Thus chemistry as such is not a strong point of the book. Nevertheless the authors are to be congratulated on the volume of invaluable information packed into each

chapter which, in common with many other volumes in the Developments Series, justifies their purpose. References are somewhat limited in the applications chapters and drawn rather heavily from the patent and trade literature, whereas they are excellently compiled in the physiological chapters, with much quoted from the late 1970s and 1980s. Grenby, for example, also includes a number of his own excellent contributions on the effects of sweeteners on dental health.

The strength of this book lies in the very new information that it contains set in the context of a balanced overview of the modern sweeteners. We learn, for example, of the increase in respiratory quotient after galactose consumption and of the use of 'coupling sugar' (glucosyl sucrose and maltosyl sucrose) for dental health, that stevioside, although relatively unknown in the West is now widely used in Japan as are new combinations of sweeteners to optimise taste quality. Some of the latest information on the metabolic fate and toxicity of the sweeteners is presented in depth and Snodin and Daniel point out that toxicity depends on sweetening power. The current USA definition of 'non-nutritive sweetener' is misleading in this respect as it is applied to any sweet substance having less than 2% of the caloric value of sucrose per equivalent unit of sweetening capacity. This implies that any compound with the same caloric value as sucrose will be classified as 'non-nutritive' providing it is at least 50 times sweeter than sucrose. As Lindley points out, in his chapter, this includes both aspartame and thaumatin. Also included with the book are several important pointers for the future, including the use of 4,1¹,6¹-trichloro:4,1¹,6¹-trideoxy galacto sucrose (TGS).

The editors have produced a well set out and highly readable text notable for an absolute minimum of grammatical errors. However, Sicard and Leroy's statement (p. 18) that 'the overall approximate composition of Lycasin 80/55 is: Sorbitol 44%, Dextrose 56%', must be a mistake as this clearly is meant to apply to the fully hydrolysed product. Again on p. 28 Williams has drawn α -D-galactose instead of β . On p. 79 Grenby mentions 6-*o*- α -D-glucopyranosyl mannitol when, according to IUPAC nomenclature it should be 1-*o*- α -D-glucopyranosyl mannitol. The mistake is taken one step further by Snodin and Daniel on p. 173 when isomalt is stated to contain β -linkages!

Despite the few structural anomalies noted the book is of a high scientific standard. It has a concise and useful index and matches the editors' intentions in its contents. In fact the book fulfils the dual purpose

of updating knowledge and whetting appetites for further developments. The reasonable price of this book makes it an imperative purchase for all who are interested in the subject.

G. G. Birch

Methods of Enzymatic Analysis. Volume III: Enzymes 1: Oxidoreductases, Transferases. By Hans Ulrich Bergmeyer. Verlag Chemie, Weinheim, Deerfield beach (Florida), Basel, 1983. xxvi + 605 pp. Subscription price: DM 191, post subscription price DM 224. (Subscription prices apply when all 10 volumes are ordered. Individual volume price: DM 258.)

The third volume of Bergmeyer's *Methods of Enzymatic Analysis* deals with oxidoreductases and transferases as analytical reagents. The oxidoreductases are possibly the most important class of enzymes used in analytical chemistry; every food scientist is familiar with glucose oxidase. This volume also contains three review sections on: methods of enzyme determination, the measurement of catalytic activity in body fluids other than blood, and isoenzyme analysis. The review chapters are well written and should be of especial interest to those new to enzymology.

The meat of the book, however, deals with the assay of various selected enzymes and the use of these enzymes as analytical reagents. While most of the chapters present sensible logical assays, some do not. The assay given for xanthine oxidase for example seems needlessly complicated, involving the coupling of peroxide formation to acetaldehyde oxidation via catalase and alcohol dehydrogenase. Since acetaldehyde is a good substrate for xanthine oxidase as well as aldehyde dehydrogenase it is surprising that the authors found this assay to be accurate. This chapter also has a glaring typographical error, the product of acetaldehyde oxidation is not urate but acetate.

My other complaint against the book concerns the practice of having several separate chapters on one enzyme. Surely it would have been possible for one author to consider the merits of lactate dehydrogenase in one chapter rather than four.

There is no author index, and I found the general index a bit sparse. However, on the whole the book is well produced.

There is no doubt that this series is an invaluable aid to those who routinely use enzymes in chemical analysis. It seems a pity, though, that a