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Food Chemistry, Vol. 57, No. 2, pp. 357–358, 1996
Published by Elsevier Science Ltd
Printed in Great Britain
0308-8146/96 $15.00 + .00

Book Reviews

Crystallization Technology Handbook. Ed. A. Mersmann. Marcel Dekker Inc., New York, 1995. ISBN 0 8247 9233 5. 688 pp. Price: $195.

The aim of this book is to provide reliable information on the science of crystallization from solution or melt, as well as considering design procedures of laboratory, and especially industrial, crystallizers.

Contributing chapters are provided by academics and industrialists from France, Germany, Japan, Canada, Israel and USA. The emphasis is very much geared towards chemical engineering and applied chemistry, and it is notable that none of the authors appear to be involved in the food industry.

The book certainly provides a thorough grounding in the fundamentals of crystal formation, the design and control of crystallization through to the economics of the process. The theoretical and mathematical treatments of the processes involved, such as heat and mass transfer and fluid dynamics, are very detailed. Considerable attention is paid to scale-up of crystallizers. An extensive appendix listing important physical properties of many crystallization systems is provided along with some design data for industrial crystallizers. The book lacks general information on applications of crystallization, and is rather heavy-going.

The work is clearly beyond the scope of students of Food Science or Technology, but would serve as a useful reference volume for people in academia or industry who are involved in industrial-scale crystallization. It is a shame that more emphasis is not placed upon examples of applications in the food industry.

The presentation is quite good and it is well-referenced and reasonably well-written, although it should be stressed that it is a handbook and not a light read!

Alistair Grandison

A Dictionary of Food and Nutrition. Arnold E. Bender & David A. Bender. Oxford Paper Back Reference, 1995. ISBN 0 14 280006 X (6000 entries). Price: £7.99.

This extremely useful little book appears to be the sequel to the original hardback Butterworth text but it now has more entries as well as retaining some important appendices (units, energy and reference nutrient intakes, E-numbers, vitamins, etc.). In fact the only slight drawback from the original text is the lack of page numbering, but that does not matter in a dictionary.

Some of the new entries are fascinating! I had never heard of 'stamp and go' (acra) which is a Caribbean battered salt cod dish or 'old clothes stew', which is a Castillian dish made of left-over meat, with onions, peppers, aubergines, tomatoes and garlic. 'Hindle wakes' turns out to be an old English dish of chicken stuffed with fruit and spices including prunes while 'Caudle' is hot spiced (mulled) wine. It was good to see an important new sweetener, 'sucralose' (trichloro-trideoxy galactosucrose) listed, though the figure of 2000 for its sweetness potency is wrong, as it is actually nearer to 600.

The Benders should be congratulated on producing this useful little book which is so attractively low in price that no-one could even think twice about acquiring it.

Gordon Birch

Food Macromolecules and Colloids. Eds E. Dickinson & D. Lorient. RSC, 1995. ISBN 0 85404 700 X. xiv + 586 pp. Price: £92.50.

This superbly produced book is the proceedings of an International Symposium held in March 1994, at the University of Burgundy, Dijon and was the fifth in a series of biennial Meetings organised by the Food Chemistry Group of the Royal Society of Chemistry. The programme's main aim was to determine the role of macromolecular interactions in determining the physical and biochemical properties of well-defined, multi-phase, multi-component systems. To a large extent the book succeeds in these aims.

The book contains 79 articles composed of invited, overview lectures (most of which are excellent), short oral presentations and poster presentations. After an Introductory lecture (article) by Professor Eric Dickinson of the University of Leeds, in which he succinctly and clearly summarises developments over the last eight or so years in primarily, but not exclusively, his own areas of expertise, the book divides naturally into eight sections: Adsorbed Layers, Protein Interactions and Functionality, Emulsions, Foams, Mixed Biopolymers Systems, Gels and Networks, Rheological and Mechanical Properties and Glasses.

The invited articles lend a natural coherency to the book and will, in most cases, make a very useful source of reference for both established workers in the area and new converts to the intricacies of food macromolecules. The contributed articles are in all cases presented as short (3–7 pp.) research papers and in many cases are merely ploughing the same furrow a little deeper. Why

do so many polymer scientists feel the need to quote so extensively from their own research publications with only, in some cases, token reference to other work? Such presentation suggests that many of the models studied are so specialised that they can not shed light on other systems, including real foods. This is obviously not correct and it is one of the roles of food scientists working in this complex field to ensure that their more fundamental colleagues do not lose sight of the real world.

The quality of the science is of uniformly high standard for 'Conference Papers' and the editors are to be congratulated for ensuring the numerous contributions have been presented so well. I was particularly impressed with their ability to put together a reasonably comprehensive index from such a large range of diverse articles.

In conclusion this is a very useful addition to the literature on food macromolecules and colloids which will be read, or rather dipped into, by researchers in the field for both pleasure and enlightenment in the coming years, assuming they can afford to purchase it.

D. A. Ledward

Enzymatic Browning and its Prevention. Eds by C. Y. Lee & J. R. Whittaker. ACS Symp. Ser. 600, 1995. xii + 338 pp.

This book was developed from a symposium sponsored by the American Chemical Society in August 1994, and is devoted to enzymic browning and its prevention. There are 24 chapters, which are divided into four sections, a preface, and indices of authors, affiliations and subjects. Scientists from many of the major centres worldwide have contributed chapters dealing with various aspects of polyphenol oxidase (PPO)-induced browning.

The first section, entitled '*Perspectives*' comprises four chapters. The first gives a concise (six page) summary of the chemistry of enzymic browning, focusing on recent advances. Chapters 2–4 deal with a review of methods of preventing browning, the biochemistry of browning in fruits and methods for control, and prevention of browning in grape and wine systems, focusing on the use of glutathione. The second section of the book, called *'Structure, function and molecular biology of polyphenol oxidase'* comprises five chapters. The first is a review of the molecular and active site structure of tyrosinase. The second chapter details procedures for the differentiation of fungal tyrosinases and laccases. The following three chapters are concerned with the phylogenetic distribution biochemsitry and biology of PPO.

'Chemistry of browning' is the topic of section three, which has seven chapters. Two deal with browning in grape systems and one with browning in water convolvulus. The section also covers the formation of chlorogenic acid *o*-quinones in (−)-epicatechin-containing model systems and possible means of exploiting tyrosinase activity in both aqueous and non-aqueous media (including synthetic chemistry, polymer modification, bioremediation and biosensors). One chapter describes how difference spectra spectrophotometry can be used to rapidly and precisely determine PPO activity and polyphenol concentration. The final chapter in the chemistry section is concerned with the antioxidant properties of the products formed when PPO acts on catechin.

The last section of the book deals with *'Enzymatic browning and its prevention'* and is divided into eight chapters. Each deals with the action of specific inhibitors or processing conditions on browning in various foods or on PPO activity in model systems. Topics discussed regarding apples are the inhibition of apple-slice browning by 4-hexylresorcinol, prevention of PPO activity in Japanese apples by heat, ascorbic acid and reduced oxygen, and the effect of cyclodextrins on polyphenol oxidation catalysed by apple PPO. One chapter deals with browning in pre-peeled potatoes and mushrooms, while another contribution covers the use of sulphite substitutes for preventing browning in foods such as pineapple and shrimp. Finally, three chapters are concerned with the inhibition or inactivation of PPO in model systems. These include a consideration of the mechanisms by which some reducing compounds inactivate PPOs, the inhibition patterns of PPO extracted from burdock and the effects of maltol and kojic acid on browning.

The editors state that the objectives of the book are to provide a broad but detailed treatment of the current knowledge of PPO, including structure and function, molecular biology, biosynthesis and regulation, chemistry of formation of brown products and prevention of browning in fruits and vegetables. As such, the book is a success. It is highly recommended to all those researching in the field of enzymic browning, especially inhibition of the reaction.

The book benefits from careful editing and the presentation is of the usual high standard of proceedings of ACS symposia.

J. M. Ames