

using affinity techniques), chitosan and semi-synthetic sulfamino-galactoaminoglycans. The 21 contributions concerning microbial polysaccharides and enzymes discuss and describe mainly, the structure and solution properties (as well as production and utilization) of exocellular polysaccharides and structure-activity relationship of immunogenic polysaccharides and their use as vaccines. Measurement and modification of starch using microbial enzymes are also presented. Only alginates and agar were covered by four contributions concerning algal gel-forming polysaccharides, whilst 10 contributions deal with structures of cellulose, gel-forming polysaccharides, cyclic glucans and glycosaminoglycans by e.g. spectroscopic and light scattering techniques. The book concludes with a contribution dealing with future trends in research and application of industrial polysaccharides.

Contributions to this book are the proceedings of the third international workshop on industrial polysaccharides held at the Area de Ricerca di Trieste, Italy, in October 1988 and as such, contributions are in camera-ready format producing a book having non-uniform printing. However, the book is a good source of valuable information for recent developments especially on the use of polysaccharides as vaccine and on the structure/function relationship of carbohydrate polymers. Some editing mistakes were found; one which is significant is in a paper contributed by the reviewers showing the same figure for Figs 1 and 3. Otherwise, the book should find a place in the library of researchers involved in polysaccharide studies.

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The Maillard Reaction in Food Processing, Human Nutrition and Physiology. Edited by P. A. Finot, H. U. Aeschbacher, R. F. Hurrell and R. Liardon, Birkhauser Verlag, Switzerland, 1990. 516 pp. ISBN 3-7643-2354-X. Price SFR 108.00.

Much attention has recently been focused on the nonenzymatic browning reaction between an amino acid and sugar, also called glycosylation, glycation or Maillard reaction. It is indeed a very important reaction involved in most food processes, in particular, with regard to colour, flavour and nutritional properties. In addition to both its favourable and unfavourable contributions to food, some other aspects of this reaction have recently stimulated the attention of chemists, biochemists, food technologists, toxicologists and other scientists to explore this field.

This book reflects the collection of work done which has been apportioned into five major topics in order to advance the subject to a higher level of understanding. The first section is on the basic chemistry of Maillard reaction which vividly elucidates the possible chemical pathways leading to a complex mixture of products. An HPLC and GC method of determining Maillard reaction products and intermediates has been presented which could be very useful in detecting the early stage of the reaction and in evaluating chemical changes during food processing. The next set of discussions will appeal more to food technologists since it covers actual applications of Maillard reaction to food — its effect on sensory properties of food and the main variables that can affect the extent of browning reaction. One of the more important aspects of Maillard reaction i.e. its effect on nutrition and food nutritional value is discussed in the third section. Interesting studies which reveal some of the physiological advantages and antioxidative effects *in vivo* of Maillard reaction products are presented. Examples of these are recent evidences on their anticarcinogenic effect and inhibition of *in vivo* mutagenicity by Maillard reaction products and coffee. Whilst there are physiological desirable effects of Maillard reaction, the fourth section on toxicology describes some Maillard reaction products which are potent mutagens or carcinogens. Finally, the last section describes the glycosylation of important biological proteins such as human IgG, albumin, DNA, etc., with reducing sugars, particularly glucose. Association of this reaction to various biological processes and disorders such as arteriosclerosis, cataracts, mutations and finally ageing is presented.

The book is excellently presented. The text is aptly supported by figures and tables. A list of references follow each discussion as an aid to further reading. As an added treat, a short verse on the Maillard reaction is presented which summarizes the whole content of the book. The book is recommended as a reference material for scientists in the different disciplines.

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Physiology of Immobilized Cells. Edited by J. A. M. de Bont, J. Visser, B. Mattiasson and J. Tramper, Elsevier Science Publishers, Amsterdam, 1990. xiv + 716 pp. ISBN 0-444-42700-7. Price: US\$218.00/ Dfl.425.00.

The text of this exhaustive volume covers the many various illuminating articles presented in the International Symposium entitled 'Physiology of