

Book Review

Maillard Reactions in Chemistry, Food, and Health. Eds T. P. Labuza, G. A. Reineccius, V. M. Monnier, J. O'Brien & J. W. Baynes. The Royal Society of Chemistry, 1994. ISBN 0 85186 802 9. 440 pp. Price £67.50.

This book contains the proceedings of the 5th International Symposium on the Maillard Reaction which was held at the University of Minnesota in Minneapolis, in 1993, and comprises 64 papers, 51 poster abstracts and a symposium summary. Nearly 300 scientists contributed to the edition and the topics discussed include the chemistry, kinetics, technology and toxicology of the Maillard reaction, as well as the relationship with health and aging. It also contains reviews on the role of the reaction in foods, the effects of advanced glycosylation end-products (AGE) in biological systems, the formation of Maillard products in pharmaceutical preparations, and an interesting article relating the Maillard reaction and the cooking of food to the development of the human race! The papers are divided in sections of chemistry (13 papers), food (12), and health (35), whereas poster abstracts are organised under the headings chemistry (22), pharmacology/biochemistry (16), and toxicology/aging (13).

The symposium took place 40 years after the classic review publication by John E. Hodge in the first volume of the *Journal of Agricultural and Food Chemistry*. There has been a dramatic expansion in this area of research since that publication. However, much of today's understanding of this reaction is still based on his hypothesis. This is a worthy tribute to the quality of his original work.

The present publication places emphasis on the implications of the Maillard reaction in health and aging, which has recently received increasing attention in medicine. This contrasts with the previous symposium where the reaction in food and nutrition dominated the

contributions. In the area of Maillard reaction in health and aging, a number of papers report on non-enzymatic glycosylation of physiologically important species such as enzymes, low density lipoproteins (LDL), collagen, and damage to DNA. A few papers discuss Maillard products with mutagenic (or antimutagenic) and carcinogenic effects and the role of aminoguanidine as inhibitor of the reaction in diabetes.

Progress in the understanding of the complex mechanisms associated with Maillard chemistry is shown in a number of mechanistic studies using labelled isotopes, systematic kinetic and molecular modelling approaches, and FTIR spectroscopy. Several papers also contribute to the understanding of the less-defined colour chemistry and factors controlling browning.

The Maillard reaction, as occurring in foods, receives relatively little attention in the proceedings. The importance of temperature and water activity on formation of Maillard-derived compounds in some foods are discussed. The most novel subject in this field is the role of food structure, i.e. glass transitions, in modulating the rate of the reaction. This may be especially significant in the region of the glass transition temperature (T_g) where the activation energy may be quite high and therefore small shifts in temperature may result in large changes in the rate of reaction.

Summarising, this hard-bound volume is well referenced although the index is somewhat limited. Overall, the research papers are short, compact, well presented, but are diverse in content. It may, therefore, be difficult for the novice reader in this area to assess the importance of the present topics. It is recommended reading for researchers in food science and medicine, although previous experience in Maillard research is required to fully appreciate its value.

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