

## Book reviews

**G.A. Burdock (Ed.), *Fenaroli's Handbook of Flavor Ingredients*, 5th ed., CRC Press, Boca Raton, FL, USA, 2005 (xxx + 2009 pp., £199.00, ISBN 0-8493-3034-3)**

The U.S. Food and Drug Administration (FDA) defines flavoring agents as adjuvants as 'substances added to impart or help impart a taste or aroma in food'. Although the definition of a flavor will vary according to the source. FDA identifies flavor enhancers as 'substances added to supplement, enhance, or modify the original taste and/or aroma of a food, without imparting a characteristic taste or aroma of its own'. The term artificial flavor or artificial flavoring means any substance, the function of which is to impart flavor, which is not derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, fish, poultry, eggs, dairy products, or fermentation products thereof.

*Fenaroli's Handbook of Flavor Ingredients* has remained the standard reference for flavor ingredients throughout the word. As per the editor's note, this volume is the fifth edition of the above and has been expanded over the previous edition with over 100 new entries, including many botanicals and other natural substances.

This volume is a completely revised version with up-to-date information, with alphabetical listing of various flavoring ingredients. Each entry contains (where appropriate) primary name, synonyms, CAS number, FEMA number, NAS number, EINECS number, EEC number, CoE number, JECFA number, description, sensory thresholds, molecular structure, empirical formula/MW, specifications, natural occurrence, synthesis, consumption, food functions, regulations/guidelines. Besides this, it also contains summarized information about flavors, glossary of different terms and brief explanation of synthetic and natural flavours.

This volume is an authoritative and illustrative compilation of different flavor ingredients with more than 5000 tables. In conclusion, this handbook provides an abundance of information on flavor ingredients, and would be excellent resource for flavor chemists, food scientists, food safety and quality control personnel, and professionals in the pharmaceutical, dietary supplement, and cosmetic industries.

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**K. Shetty, G. Paliyath, A. Pometto and R.E. Levin (Eds.), *Food Biotechnology*, CRC Press, Taylor and Francis Group, Boca Raton, FL, USA, 2006 (xxvi+1982 pp., £130.00, ISBN 0-8247-5329-1)**

Man has exploited biotechnology for thousands of years in various activities, however, the discovery of genetic engineering techniques is responsible for the current 'biotechnology boom' and has doubtless been the main cause of much recent publicity of biotechnology. Not only these techniques offer the prospect of improving existing processes and products, but they are also enabling us to develop totally new products, which were not previously possible. Food biotechnology integrates biochemistry, microbiology, genetic engineering, and chemical engineering for the enhanced production, processing and preservation of food products. The recent biotechnological techniques have a distinct impact on food processing industries and have opened up the newer possibilities for rapidly improving the quantity and quality of available foods. Exciting opportunities in unique ingredients, new product development, cost reductions and novel processing methods will occur by application of new technologies.

*Food Biotechnology* explores the latest research and advances in the impact of biotechnology in food production and processing. The contents of the book are divided into three sections. The first section explains the basic principles of microbiology, fermentation technologies, and aspects of genetic engineering used in the production of various food ingredients. The next section comprises several chapters, which deal with different aspects of plant tissue cultures techniques, genetic engineering of plants and animals, functional food ingredients, probiotics, and topics on enzyme technologies.

Food borne diseases are responsible for numerous types of illness and pathogens responsible for these illnesses include viruses, eukaryotic parasites, and bacteria. An understanding of microbial population and our ability to control the presence of pathogens in foods is critical element in food safe-

ty. Biotechnology has also played an important role in development of newer bio-preservation techniques for food preservation. Besides the important contributions of the newer techniques in food processing, it is also important to consider any potential human health or environmental risks when foods are developed using biotechnology. The final section of the volume is focussed on the food safety, novel bioprocessing, traditional fermentations, and regulatory issues.

In conclusion, this volume is an authoritative and illustrative compilation of different issues related to food biotechnology and would be excellent source of information on food production and processing from a biotechnology perspective, not only to the academicians but also to the persons working in industry.

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**M.G. Gallego and M.A. Sierra (Eds.), Organic Reaction Mechanisms, Springer-Verlag GmbH, Heidelberg, Germany, 2004 (x+290 pp., £38.50, ISBN 3-540-00352-5)**

The mechanism of a chemical reaction can be considered as a hypothetical motion picture of the behaviour of the participating atoms. The reliability of the proposed mechanism increases if it leads to quantitative predictions as to how the speed of the reaction is affected by concentrations of reactants, temperature, solvent and the presence of catalysts. The interpretation of the experimental data is a key point in any type of experimentation. The book on *Organic Reaction Mechanisms* explains the various approaches to interpret the experimental data obtained from an organic reaction and specifically how an organic reaction mechanism can be considered or rejected based on the analysis of experimental evidence.

The examples given in the book have been taken from the recent literature and deal with the formulation and experimental determination of mechanistic proposal. The information presented is generally considered necessary in the elucidation of reaction mechanisms including kinetic and thermodynamic data, isotopic labelling and organic reactivity. Every case includes brief introduction, experimental data, discussion and additional references.

The examples given have been divided into three levels. The fundamental concepts regarding the elucidation of an

organic reaction mechanism have been illustrated in level 1. Some examples are also dedicated to revising the different types of pericyclic reactions such as cycloadditions, electrocyclic ring closures and sigmatropic rearrangements. The cases with increasing order of difficulty have been placed in level 2 and 3, mixing the different techniques and data to understand the different aspects of the example under discussion.

All the cases presented in the book have been nicely illustrated that cover all the main topics of organic chemistry and this book is an innovative contribution to the subject. In conclusion, this book can be excellent source of information not only to the students but also to the academicians working in the area of organic chemistry.

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**P.M. Collins (Ed.), Dictionary of Carbohydrates with CD-ROM, Chapman & Hall/CRC Press, Boca Raton, FL, USA, 2006 (xxi+1282 pp., £182.40, ISBN 0-8493-3829-8)**

Carbohydrates are essential components of all living organisms and are the most abundant group of biological molecules. These are the main source of energy supply in most cells. The metabolic breakdown of monosaccharides provides most of the energy used in biological processes. These are also principal components of nucleic acids as well as important elements of complex lipids. Oligosaccharides are often associated with proteins and lipids in which they have both structural and regulatory functions. Polysaccharides have indispensable structural functions in all types organisms but most conspicuous in plants because of cellulose. Polysaccharides such as starch in plants and glycogen in animals serve as important nutritional reservoirs. Carbohydrates are playing very important role in the biological and pharmaceutical sciences. Therefore, carbohydrate science has become a discipline of central importance to the chemical and biological sciences.

*Dictionary of Carbohydrates with CD-ROM* provides a wealth of information for carbohydrate researchers. As per the editors note, this volume is a much enlarged and revised second edition of the dictionary published earlier. The number of compounds included has been substantially increased, however number of entries present in the previous compilation for antibiotic and other natural product