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Book reviews

R. Wood, L. Foster, A. Damant, P. Key, Analytical Methods for Food Additives, Woodhead Publishing Ltd, Cambridge, UK, 2004 (x+258 pp., ISBN 0-85573-7221).

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Food additives can perform various technological functions, for example, preservatives can increase shelf life and antioxidants can protect against rancidity. The applications of the additives in food can be divided into several parts: colours in food, sweeteners, miscellaneous additives (other than colours and sweeteners) and flavourings. They are all controlled by separate legislations. To ensure consumer safety, existing intake estimations and safety monitoring of additives requires robust quantitative analytical methods for the accurate measurement of additives in food. Although established analytical methods for many additives have been discussed in the scientific literature, this volume provides an authoritative 'one-stop' publication that helps scientists and engineers to understand the principles and procedures underlying the analytical methods, and to utilise them effectively.

Analytical Methods for Food Additives provides a structured and systematic account of the most widely used available methods for the determination of additives in specified foods. The performance characteristics, where available, and recommendations for further research to improve method availability are also covered. The volume addresses the analytical methods for 26 major additives, which span from azorubine and adipic acid to sunset yellow and saccharin. For each of these additives, an introduction, a summary of available methods of analysis, procedures and parameters, recommendations and appropriate references are provided. There are also 79 tables in this volume, which summarise available methods, statistical performance parameters for the methods, and results of collaborative trials using the methods.

In conclusion, *Analytical Methods for Food Additives* is an up-to-date, clearly written and well-presented compendium that is a valuable reference tool for food analysts, which will help to ensure the accurate measurement of additives in foods.

J. H. Gross, Mass Spectrometry: A Textbook, Springer, Berlin, 2004 (xviii+518 pp., £46.00, ISBN 3-540-40739-1).

Mass spectrometry is an indispensable analytical tool in chemistry, biochemistry, pharmaceutical science and medicine. It can supply molecular weight information and serves as a powerful tool for analytical applications and basic research. Almost all techniques for achieving the goals of ionisation, separation and detection of ions in the gas phase can be applied in mass spectrometry.

This volume is composed of twelve sections. The first section introduces the basic principles of mass spectrometry and some associated concepts, such as the mass spectrum. The second chapter deals with the fundamentals of gas phase ion chemistry, i.e. ionisation, excitation, ion thermochemistry, ion lifetimes, and reaction rates of ion dissociation. The isotope properties in mass spectrometry are discussed in the next chapter. Isotopic masses, their relation to elemental weights, and high-resolution and accurate mass measurements are discussed in this chapter. The fourth chapter discusses different types of mass analysers in order to understand their basic principles of operation and their specific properties. Detailed information about technical and practical aspects concerning the construction of electron ionisation (EI) ion sources and sample introduction systems is presented in Chapter 5, followed by the introduction of common fragmentation pathways of organic ions and the resulting methodology for the interpretation of EI mass spectra, in Chapter 6. The principles and some aspects of chemical ionisation (CI) are covered in the next chapter. CI is one of the soft ionisation methods, along with field

ionisation (FI) and field desorption, which are focused upon in Chapter 8. Chapter 9 is concerned with ion sources, formations and applications of fast atom bombardment (FAB) and liquid secondary ion mass spectrometry (LSIMS). The ion sources, sample preparation and the application of matrix-assisted laser desorption/ionisation (MALDI), are covered in Chapter 10. The penultimate chapter discusses another important soft ionisation technique, namely electrospray ionisation (ESI). Hyphenated techniques, such as chromatography-mass spectrometry coupling, tandem mass spectrometry and ultrahigh-resolution mass spectrometry, are covered in the final chapter.

This volume provides detailed information on many aspects of mass spectrometry, and is a useful textbook for students in chemistry and the life sciences who will encounter such techniques as powerful analytical tools during their studies. It is also recommended to novices to mass spectrometry from other research fields.

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S. Doonan, Nucleic Acids, The Royal Society of Chemistry, Cambridge, UK, 2004 (vi + 185 pp., £14.95, ISBN 0-85404-4817).

Nucleic acids are responsible for the continuation of all forms of life on earth, and are essentially informational macromolecules—and stretching a point they are a 'form' of carbohydrate polymer. DNA and RNA are two types of nucleic acids: DNA encodes the instructions that are passed on from parents to progeny as the carrier of genetic information; RNA is the related molecule of DNA, which serves the same function in some viruses, such as HIV. This volume provides general information about the structures and biological roles of nucleic acids, and their structure–function relationships, and is comprised of five sections.

The first section covers the biological roles of the nucleic acids, beginning with the discovery of DNA, followed by DNA function as the carrier of genetic information, and finally introduces general information regarding molecular biology. The second section deals with the covalent structures of nucleic acids, firstly comparing the building blocks of DNA and RNA, then describing nucleosides, nucleotides and inter-nucleotide linkages. Information about shorthand notations, oligonucleotides and the size of nucleic acid is included in this section. The three-dimensional structure of DNA and its implications for replication is discussed in the third section. This starts with a general description of the complete structure of DNA molecules, followed by detailed information about the DNA double helix structure, and finishing with discussion of nucleosomes and chromosomes, and the processes of DNA replication and repair.

The fourth section focuses on the processes of transcription (DNA to messenger RNA) and translation (messenger RNA to protein) of the genetic message. Some information about ribosomal and transfer RNA is also included. The final section introduces advanced methodologies in DNA analysis, such as gel electrophoresis, restriction enzymes, DNA sequencing, and the polymerase chain reaction (PCR), which is one of the most widely used tools in molecular biology. Finally, computer applications in DNA chemistry and chemical synthesis of oligonucleotides are discussed.

This volume is part of the RSC *Tutorial Chemistry Texts* series and provides a clearly and concise overview of nucleic acid chemistry, which is highly recommended for undergraduate students in chemistry and related fields and all individuals requiring informed background information on this interesting topic.

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S. Roller (Ed.), Natural Antimicrobials for the Minimal Processing of Foods, Woohead Publishing Ltd, Cambridge, UK, 2003 (xii + 306 pp., £115.00, ISBN 1-85573-669-1).

A reduction in the risk of food intoxication is possible by addition of antimicrobial agents to food products. Such antimicrobial agents are aimed at decreasing the growth of microorganisms naturally present in food, thus increasing safety, quality and shelf life of food products. Commonly used antimicrobial agents are synthetic (e.g. nitrite and sodium benzoate), some of which exhibit potential toxic effects by either triggering allergenic reactions in sensitive individuals or via the generation of carcinogenic by-products. To overcome these problems, natural antimicrobial products such as nisin, natamycin and organic acids are