

This provides a good understanding and knowledge of plant development and biotechnology. The text is supported by illustrations and tables and would be found useful to persons studying plants and researching into the future of biotechnology concerning plants.

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I. Molnar-Perl, editor. Quantitation of Amino acids and Amines by Chromatography: Methods and Protocols, Elsevier B.V, Amsterdam, The Netherlands, 2005 (xii + 655 pp., £170.00, ISBN 0-444-52050-3)

Analytical techniques play a very important role in all the scientific and technological processes. Science has witnessed a rapid expansion of all types of analytical methods, and different instruments have come into picture with the advancement of technology. This rapidly growing area has led to the development of techniques, which are highly sensitive, accurate and less time consuming. Different chromatographic techniques have become popular analytical techniques for the qualitative and quantitative determination of a wide range of substances. The wide choice and sophisticated columns, detectors, derivatization procedures, the development of modern instrumentation and data handling systems have reduced time and costs, and give versatility, sensitivity and reproducibility. *Quantitation of Amino acids and Amines by Chromatography: Methods and Protocols*, volume 70th of Journal of Chromatography Library series, provides a wide range of chromatographic techniques for the identification and quantification of amino acids and amines in various matrices.

Amino acids are important biological compounds building peptides and proteins, and exist in foods, feeds, body fluids and tissues. The chirality of amino acids plays an important role in many fields of biosciences including synthetic peptide chemistry and peptide drug design. Therefore, the separation and detection of chiral amino acid has become an interesting and important research topic. Amines are organic compounds, which are of significant concern with respect to series of chemical and biochemical processes. For this reason their determination in a wide range of matrices including biological fluids and tissues, natural products, foods and related products or environmental samples is of particular importance. A considerable number of chromatographic based methods have been developed to make accurate determinations of amino

acids and amines. Part 1 and Part 2 of the book is focussed on the quantitative determination of amino acid, and amines, respectively by different chromatographic techniques. Different chromatographic techniques such as gas chromatography, high performance liquid chromatography and capillary electrophoresis/capillary electrochromatography have been described. Subsections deal with the analysis of compounds in natural form, followed by various derivatization protocols.

An overview of quantitation of amino acids and amines simultaneously, is presented in chapter 3. The recent developments in polyamine analysis by chromatography are summarized in the last chapter. A substantial part of this chapter is devoted to the most important biogenic polyamines, and some attention is given to synthetic polyamine polymers.

This volume provides an overview of theory and protocols along with chromatograms of various chromatography techniques. In conclusion, this volume can be useful guide to the students, academia, researchers, practitioners and consultants working in environmental testing laboratories, food and pharmaceutical industry.

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R. Breslow, editor. Artificial Enzymes, Wiley/VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2005 (xii + 181 pp., £55.00, ISBN 3-527-31165-3)

Enzymes, also called biocatalysts have wide range of potential applications in various industrial processes. These macromolecules have fascinated scientists and technologists for many decades. Although chemical synthesis and recombinant technologies have made many enzymes available for medical and biotechnological applications, the design of artificial protein catalysts for tasks unimagined in biology remains a challenging work. The properties of artificial enzymes help us understand the special properties of nature's enzymes. The great challenge in achieving, with artificial enzymes, the huge rate accelerations that the best natural enzymes can achieve make us think more deeply about the natural enzymes. With the advancement in modern science, diverse strategies for creating new enzymes have been explored.

The book on *Artificial Enzymes* describes the various approaches to the synthesis and study of artificial enzymes. The book opens with a chapter on artificial enzymes, which covers

enzyme models and enzyme mimics. A major theme is the use of hydrophobic binding of substrates into cyclodextrins carrying catalytic groups to imitate the reversible formation of enzyme–substrate complexes. The creation and study of artificial transaminases and other enzyme mimics based on co-factors in the pyridoxal/pyridoxamine family are described in Chapter 2. Chapter 3 is focussed on the evolution of synthetic polymers with enzyme-like catalytic activities.

The information on the progress made in engineering catalytic antibodies has been reviewed in Chapter 4. Protein-based artificial enzymes, and artificial hydrolytic metalloenzymes have been covered in Chapters 5 and 6, respectively. These chapters provide information on modifying natural proteins to impart novel catalytic activity, and some of the fundamental roles of metal ions in hydrolysing esters, amides, nitriles and phosphate esters.

Molecular biology and biotechnology play essential roles in science and industry. The preparation of artificial restriction enzymes has been one of the most attractive themes for scientists, since they are essential for manipulating DNA in future biotechnology. This concept of artificial restriction enzymes as tool for future molecular biology and biotechnology is covered in the last chapter.

The topics in the book are well illustrated with suitable figures and recent references. In conclusion, this book is a big contribution to the emerging and fascinating area of enzyme technology and will serve as an excellent source of information for chemists, biochemists, biotechnologists and molecular biologists.

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A. Steinbuchel and S.K. Rhee, editors. Polysaccharides and Polyamides in the Food Industry vols. 1 and 2, Wiley/VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2005 (xx + 771 pp., £210.00, ISBN 3-527-31345-1)

Living organisms synthesize a wide variety of different polymers and some of the polymers are also produced from microorganisms through fermentation techniques. However, by far the largest amounts of biopolymers are still obtained from plant and animal sources or from algae. Biopolymers exhibit fascinating properties and are of increasing importance

for various applications. Basic and applied research has already revealed much knowledge about biopolymers for their applications in different areas. These volumes provide current state of knowledge on polysaccharides and polyamides with particular reference to the food Industry.

Polysaccharides comprise a distinct class of biopolymers, which exhibit a large variety of unique and in most cases complex chemical structures, different physiological functions and a wide range of potential applications particularly for foodstuff. For instance, a number of plant polysaccharides such as starch have been widely used in food for a very long time. More recently, other plant or microbial polysaccharides have also found use in the food industry. Volume I contains 13 chapters on different polysaccharides, which include alginates, bacterial cellulose, carrageenan, chitin and chitosans from animal sources, curdlan, dextran, exopolysaccharides of lactic acid bacteria, inulin, levan, pectins, pullulan, starch, and xanthan.

Organisms and in particular microorganisms are also capable of synthesizing other biopolymers consisting of amino acids, referred to as poly(amino acids) or polyamides. Polyamides are in contrast to proteins synthesized by soluble synthetases, which use free amino acids as substrates in ATP-dependent reactions. Many proteins and poly(amino acids) are of commercial interest because of their catalytic and physiological properties. Volume 2 is focussed on the polyamides and it includes collagens and gelatins, poly- γ -glutamic acid, ϵ -poly-L-lysine, sweet-tasting proteins, vicilin and legumin seed storage proteins. Enzymes play a vital role in various industrial processes. A separate chapter is also included on the technical application of enzymes in different industries such as detergent, starch, biofuel, textile, organic synthesis, fats and oil processing.

The polysaccharides and polyamides have been discussed in terms of their history, occurrence, physiological function, analysis, biosynthesis, molecular genetics, production, isolation, purification and applications. These volumes also provide the information on the patents on different polysaccharides and polyamides.

In conclusion, these volumes would be highly informative for all the individuals working in the area of polymers, biotechnology and food technology. These may not only support research and development but may also be suitable for teaching.

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