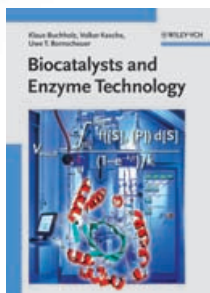




Biocatalysts and Enzyme Technology



By Klaus Buchholz, Volker Kasche and Uwe T. Bornscheuer. Wiley-VCH, Weinheim 2005. 448 pp., softcover € 69.00.—ISBN 3-527-30497-5

Biocatalysts, often also called “catalysts of life”, are nowadays fascinating objects of study for scientists from a wide range of disciplines, and they are of growing industrial importance. However, the earliest industrial application of biocatalysts began without a scientific foundation, and even without any knowledge about the nature or constitution of enzymes: in 1874, Christian Hansen founded the first biocatalysts company, which supplied enzymes for cheese production. It was not until over 20 years later that Buchner put forward the theory that enzymes are actually proteins. That remained a subject of controversy for many years, until finally, in 1926, Sumner’s crystallization of urease proved that Buchner’s surmise was indeed correct. Today, 130 years after the founding of the first enzyme business, the world annual turnover of biocatalysts is estimated to be worth well over 2 billion US dollars. If this figure seems rather small, it must be borne in mind that the value of industrial production using biocatalysts is many times greater, and its benefits are increased still further if one takes into account the positive contribution to sus-

tainability (economic, ecological, and social).

How far has our knowledge in the field of biocatalysts and enzyme technology advanced? Students and scientists who are interested in getting an answer to that question, whether they are biologists, chemists, or process technologists, are recommended to read this book. It will give them insights into the functions of enzymes, their production, their areas of application, and the forms in which they are used, whether as free or immobilized enzymes, or as intact cells. Process engineering aspects are also covered. However, as the emphasis given to the various topics tends to reflect the interests and research fields of the three authors, one does not always get a treatment that can be described as balanced. For example, over 122 pages are devoted to the subject of immobilization, which is certainly important, whereas only 43 pages are given to the production, screening, and optimization of enzymes, areas in which there have been enormous advances in recent years, and which should therefore have been covered in more detail. The comprehensive and up-to-date literature references give readers easy access to detailed information about the various aspects, and allow reading in greater depth about topics of special interest. The detailed list of contents and the index make it easy to find any particular topic in biocatalysis. At the beginning of each chapter, there is a one-page summary of the main learning points, and although these summaries sometimes contain only very general information, they give a quick overview of the contents of the chapter. The exercises and questions at the end of each chapter are mostly very relevant to practical situations, and as they are quite challenging they provide an effective way of testing what has been learned and adding depth.

Errors have been kept down to a reasonably tolerable level. Two examples: on page 13 the enzyme nitrilase is wrongly stated to be involved in the production of acrylamide, and on page 114 the reaction mechanism shown for leucine dehydrogenase is incorrect.

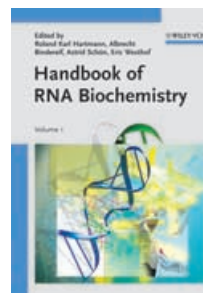
Although biocatalysts have been used in industry for many years, and enzyme technology is a well-established

field, the subject continues to advance very rapidly, stimulated especially by the growing emphasis on sustainable production processes and the introduction of new methods. This book covers a very wide range of aspects, while also treating the material in depth, and therefore it is a good starting point for readers to approach the fascinating subject of biocatalysis.

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DOI: 10.1002/anie.200585299

Handbook of RNA Biochemistry



Vol. 1 + 2. Edited by Roland K. Hartmann, Albrecht Bindereif, Astrid Schön and Eric Westhof. Wiley-VCH, Weinheim 2005. 931 pp., hardcover € 299.00.—ISBN 3-527-30826-1

This two-volume compendium is a remarkable and outstanding collection of state-of-the-art-knowledge of methods that can be applied to study RNAs and their properties. Each chapter begins with introduction/background, describes the specific topic to be covered and the methods used for studying the topic, ends with data analysis and, importantly, with a section headed “troubleshooting”. The contents are divided into five parts, the first two in Volume 1 and the last three in Volume 2.

Volume 1. In Part I (RNA synthesis), Section 1 describes the enzymatic RNA synthesis using bacteriophage T7 RNA polymerase. Section 2 covers the preparation of RNA with homogeneous 5'- and 3'-ends, RNA with functional groups at the 5'-end and RNA with 2'-fluoro-modified pyrimidine nucleotides. Sections 3 and 4 deal with RNA ligation using T4 DNA ligase to generate site-