Getting Things Moving

Biocatalysts and Enzyme Technology

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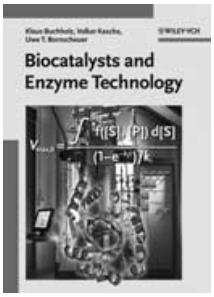

More than 130 industrial biotransformation processes had been launched by 2002 (A. J. J. Straathof, S. Panke, A. Schmid, *Curr. Opin. Biotechnol.*, *13*, 548–556, **2002**); this shows the increasing importance of understanding technological processes that employ enzymes/biocatalysts or microbial cells for industry. Furthermore, the number of processes started per year shows an exponential growth trend, thus, in this context, the launch of the book "Biocatalysts and Enzyme Technology" is just in time, since the book gives a comprehensive overview of enzyme technology for chemical- and biochemical-process engineering. Actually it was to be expected that the previously only-German edition was updated and improved to publish an English edition. The textbook addresses both advanced and graduate students in chemistry and biochemical-/chemical-process engineering, as well as scientists in industry, research institutes and university in the area of applied biocatalysis and enzyme technology.

Already in the first chapter, the reader can appreciate that chapters of the previous German edition have been fruitfully extended and that their structure has become more comprehensive. Following this introduction to the history of enzyme applications and the motivations for using these highly selective, sustainable and environmentally friendly methods, the next chapter "Basics of Enzymes as Biocatalysts" starts with the classification of enzymes and continues by touching on the general kinetic aspects of biocatalysis. It has been updated to satisfy recent developments, for example, a short overview of how to access "Better Enzymes by Natural Evolution, in vitro Evolution, or Rational Enzyme Engineering". Before students get deeper into technological aspects, a chapter on "Enzymes in Organic Chemistry" reviews most common types of enzymes used, with selected examples. This additional chapter seems to be very appropriate and gives the impression that engineers now get a solid basis and a broad view of enzyme-catalysed reactions. Subsequently, the chapter stimulates interested students to delve further into this matter.

Before the enzymes can be applied, they must be provided in sufficient amounts, this topic is addressed in Chapter 4. The enzyme applications are logically separated into chapters dealing with immobilized and nonimmobilized enzymes (Chapters 5 and 6). In both chapters, general aspects are discussed first, followed by relevant examples from industry and applications to demonstrate the applicability of the system and to increase the interest of the reader. Special techniques such as membrane systems are also discussed. Beside the technological aspects, enzyme mechanisms are also mentioned; this gives the book a vivid character. One focus of the book—judging by the number of pages—is the immobilization of enzymes, micro-organisms and cells, and the characterization of the immobilized catalyst (Chapters 6–8, ~120 pages).

The final chapter "Reactors and Process Technology" introduces various types of reactors and explains fundamentals of processes and process technology (upstream and downstream operations). The principles are exemplified by well-chosen case studies.

Since today the world wide web is of high interest, the selection of links/urls in the appendix gives an additional value to the book (enzyme providers may also be listed with their link, although such links change very rapidly).

The general concept of the first English edition is excellent; however, since the number of mistakes is still high, one can hope for a second or revised edition in which the striking mistakes will be eliminated and all figures have the general high quality. Nevertheless, students will definitely appreciate the exercises and questions at the end of the chapters for repeating and practicing what they have just read and to deepen their understanding; teachers may appreciate the proposals for experiments. To guarantee the world-wide usage of this book as a standard teaching book for enzyme technology, the authors and the publisher might consider providing a ready-prepared PowerPoint presentation for teachers.

The book is not only an excellent guidebook for the technological aspects of biocatalysis/enzyme technology, but also a supreme teaching and reference book and can highly be recommended.

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