

From the contents:

- Introduction
- Basics of Enzymes as Biocatalysts
- Enzymes in Organic Synthesis
- Production of Enzymes
- Application of Enzymes in Solution
- Immobilization of Enzymes
- Immobilization of Microorganisms and Cells
- Characterization of Immobilized Biocatalysts
- Reactors and Processes

An instructive and comprehensive overview of our current knowledge of biocatalysis and enzyme technology. Following an introduction to the history of enzyme applications and the motivations for using these highly selective and environmentally friendly methods, the book goes on to cover enzyme mechanisms and kinetics, production, recovery, characterization and their design, including recombinant methods. Alongside the application of soluble and immobilized biocatalysts, including whole-cell systems, the authors treat the use of non-aqueous reaction systems, applications in organic synthesis, bioreactor design and reaction engineering. A number of case studies further exemplify the advantages of enzyme processes. Each topic includes exercises, designed to facilitate access to this flourishing area of research.



Klaus Buchholz studied chemistry at the universities of Saarbrücken and Heidelberg, graduating in 1967. In 1969 he received his PhD from the Technical University of Munich, Germany, after which he worked as a researcher with a group on biocatalysis at Dechema e.V. in Frankfurt/Main, Germany, until 1982. In 1981 he received his Habilitation from the TU Braunschweig, Germany, where he then became department head at the Institute for Agricultural Technology and Sugar Industry. From 1988 onwards he was Head of the Institute; in 1991 he became Professor of Technology of Carbohydrates at the Institute for Technical Chemistry. His main research areas include biocatalysts, enzymatic processes for the modification and synthesis of saccharides, environmental biotechnology, and the synthesis of saccharide polymers.



Volker Kasche studied chemistry, mathematics, and physics at the University of Uppsala, Sweden, receiving his degree in 1964. This was followed by a year as a NATO research fellow at Brandeis University, USA. He received his doctorate from the University of Uppsala in 1971, and in 1973 he became Professor for Physical Biology at the University of Bremen, Germany. He has been Professor for Biotechnology at the Technical University Hamburg-Harburg, Germany, since 1986, focusing his research on fundamentals of equilibrium and kinetically controlled reactions catalyzed by free and immobilized hydrolases, the production, post-translational processing, purification and enzymatic characterization of penicillin amidases and serine peptidases, continuous protein chromatography, mass transfer in chromatography and enzyme technology.



Uwe Bornscheuer studied chemistry at the University of Hanover, Germany, where he graduated in 1990. After receiving his PhD in 1993 from the Institute of Technical Chemistry at the same university, he spent a postdoctoral year at the University of Nagoya, Japan. He then joined the Institute of Technical Biochemistry, University of Stuttgart, Germany, where he received his Habilitation in 1998. He has been Professor for Technical Chemistry & Biotechnology at the University of Greifswald, Germany, since 1999. Uwe Bornscheuer's main research interest is the application of enzymes in the synthesis of optically active compounds and in lipid modification.

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