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BOOK REVIEW

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## Methods in Non-Aqueous Enzymology

(Gupta, M. N., ed., Birkhäuser Verlag, Basel-Boston-Berlin, 2000, 218 p.)

Enzymatic catalysis in non-aqueous media represents a powerful direction in modern biochemistry and biotechnology, and the fourth volume in the series "Methods and Tools in Bioscience and Medicine" deals with recent achievements in this field. The book was written by distinguished scientists from the United Kingdom, Germany, India, Spain, Norway, France, Sweden, and Japan.

Chapter 1 (written by M. N. Gupta) considers perspectives of non-aqueous enzymology. Special attention is paid to catalysis in intact cells placed into non-aqueous media, use of antibodies in organic solvents, and protein folding in non-aqueous media.

In chapter 2 (T. Anthonsen, B. J. Sjørnes) the role of water for enzymatic catalysis in non-aqueous systems of organic solvents is discussed and several methods of controlled addition of water or drying of reaction systems are given.

Chapter 3 (G. Fernandez-Lorente, R. Fernandez-Lafuente, P. Armisen, P. Sabuquillo, C. Mateo, J. M. Guisan) deals with methods of enzyme immobilization and increase in enzyme stability in organic media. Using pig liver esterase as an example, the authors demonstrate various approaches for immobilization and post-immobilized treatment of this enzyme, and effects of co-solvents.

Immobilization of various lipases for their use in non-aqueous reaction media is considered in chapter 4 (J. A. Bosley, A. D. Peilow).

Chapter 5 (M. Nakajima, J. B. Snape, S. K. Khare) deals with applications of enzymes and membrane technology in fat and oil processing.

Principles of strategies for improvement of lipase-catalyzed preparation of chiral compounds are considered in chapter 6 (U. T. Bornscheuer).

Chapter 7 (P. Clapes, G. Caminal, J. A. Feliu, J. Lopez-Santin) deals with peptide synthesis in non-aqueous media.

The problem of enzyme selectivity in organic media is considered in chapter 8 (G. Ottolina, S. Riva). This chapter contains several demonstrative examples. In chloroform, polyphenol oxidase catalyzes regioselective oxidation of phenols containing substituents in the *para*-position; such type of oxidation does not occur in aqueous media. Other examples include effects of various organic solvents on selectivity of lipases in the reaction of *trans*-esterification.

Chapter 9 (S. Riva, G. Roda) deals with non-enzymatic conversions of sugars in non-aqueous media.

Application of reversed micelles as microreactors is considered in chapter 10 (J. Chopineau, B. Lagoutte, D. Thomas, D. Domurado) using N-terminal acylation of RNase A as an example.

Chapter 11 (K. Ramanathan, B. R. Jonsson, B. Danielsson) deals with analysis of non-aqueous environments using thermistors.

In chapter 12 A. Sadana discusses the role and biomedical aspects of environment in mechanisms of folding.

This rather compact book demonstrates a wide range of applications of enzymology in non-aqueous media. Each chapter contains bibliographical references. The index provides easy access to all information listed in the book.

"Methods in Non-Aqueous Enzymology" will be quite useful for researchers working in the field of biochemistry, bioorganic synthesis, and chemical engineering. This book can also be recommended for teachers and students of chemical, biological, and medical institutes and universities.

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