

BOOK REVIEW

BIOCATALYSIS IN ORGANIC MEDIA

Studies in Organic Chemistry

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Elsevier, Amsterdam, 426 pp., ISBN 0444427856

Biocatalysis in Organic Media is the first book devoted solely to biocatalysis (both enzymatic and microbial-based) in organic solvents. The book is the extended proceedings of an international symposium held in Wageningen, The Netherlands on December 7-10, 1986, and consists of 49 papers converging various aspects of biocatalysis in organic solvents. The papers are either original research articles or highlight the contributions from the authors' laboratories in the area of nonaqueous biocatalysis. The book is organized into the following sections that closely paralleled the symposium: (a) Biocatalyst and Medium Engineering; (b) Bioconversions; (c) Engineering Aspects; (d) Specific/Future Applications; and (e) Poster Papers.

The title of the book and the symposium are aptly named. Detailed consideration of the fundamentals of biocatalysis in water-miscible and immiscible organic solvents, in reverse micelles, and in nearly anhydrous (low water activity) systems are presented. In all, the original research articles contained in the book describe catalysis with dozens of enzymes or whole cells in a large number of organic solvents from the highly polar, such as dimethylformamide, to the highly apolar, such as hexadecane. The editors rightly point out that "it is important to recognize the broad range of biocatalyst forms which may be used for the diverse reactions of interest to industry." In fact, a number of commercial applications are highlighted in several articles throughout the book, particularly in the poster section. It is refreshing to note that whereas biocatalysis in organic media is a relatively new endeavor, industrial applications are already being performed.

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The editors have done well to highlight the many diverse interpretations concerning the mode of action of enzymes in organic solvents, particularly with respect to the question of optimal solvent choice. Many articles in the book follow the line of the editors and their respective research groups on the value of the parameter of $\log P$ (logarithm of the partition coefficient of a solvent in a standard octanol-water system) in determining optimal solvent choice for biocatalysis. Significant evidence brought out in other research articles contained in the book, however, suggests that whereas $\log P$ may be a good first approximation in choosing solvents, there are numerous exceptions to the hypothesis. Indeed, the editors have described it as "encouraging to learn of the many situations where enzymes or cells are sufficiently resilient to operate in conditions which traditionally would have been considered rather harmful." The reader gains an important degree of familiarity with the research and researchers involved in biocatalysis in organic solvents. In this sense, the book will function as a good overview of the field and will introduce the newcomer to the salient topics and major players in the field. Perhaps most importantly, the symposium along with the book will spur interest in this relatively new field and will set the foundation for future symposia for novel biocatalytic technologies.

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