

BOOK REVIEW

Biotransformations in Preparative Organic Chemistry, The Use of Isolated Enzymes and Whole Cell Systems in Synthesis. By H. G. DAVIES, R. H. GREEN, D. R. KELLY, AND STANLEY M. ROBERTS. Academic Press, San Diego, 1989.

As part of the continuing "Best Synthetic Methods" series (eight volumes) this text is designed to provide the synthetic chemist with an overview of useful biotransformations. The wide variety of methods already available in this area coupled with the rapid pace of research in biotransformations make crafting such an overview a challenging assignment. The authors have succeeded in providing a guide to useful transformations. In the preface, the authors state their intention to emphasize procedures "which should be easy to reproduce within a chemistry laboratory without the requirement of special equipment." As such, the information presented is especially well suited to laboratories in which biotransformations are not routinely used. In keeping with the theme of "preparative organic chemistry," the procedures range in scale from a few millimoles to greater than one mole.

The text is divided into five chapters. The first chapter introduces the topic and provides background. The second chapter (Hydrolysis and Condensation Reactions) discusses the cleavage and formation of ester bonds, amide bonds, and phosphate esters as well as the hydrolysis of epoxides and nitriles. The third chapter (Enzyme Catalyzed Reduction Reactions) focuses on the reduction of aldehydes, ketones, and carbon-carbon double bonds. The fourth chapter (Oxidation Reactions) deals with the oxidation of alcohols and aldehydes, Bayer-Villiger oxidations, hydroxylations, oxidations of sulfur, and epoxidation. The fifth chapter (Other Biotransformations) describes carbon-carbon bond forming reactions, carbohydrate/nucleoside/nucleotide chemistry, formation of halohydrins and dihalides, and O- and N-dealkylation.

This text is not (nor does it intend to be) a comprehensive treatment of the field of organic biotransformations. It is, however, a useful source of procedures for the organic chemist who is interested in using biotransformations to prepare significant quantities of otherwise difficult to obtain compounds.

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