

Book review

Biotransformations in Organic Chemistry, Kurt Faber fifth ed. 97., Springer-Verlag, Berlin, 2004, ISBN 3-540-20097-5 pp. 454, softcover, US\$49.95, UK£ 27.00, EUR 34.95

This is the fifth revised and corrected edition of this textbook on the use of biocatalysts (enzymes or whole cells) in synthetic organic chemistry, extending the literature coverage to the end of 2002. The first edition was in 1992 and the book has grown from a monograph to a well-respected introduction to the field for synthetic chemists who wish to take advantage of natural catalysts in the synthesis of homochiral target compounds. It addresses the advantages and disadvantages of using these catalysts and gives carefully chosen examples of enzymes which catalyse hydrolytic, redox, carbon-carbon bond forming, elimination, addition, glycosyl transfer and halogenation/dehalogenation reactions. The chapter on special techniques will be especially useful to the beginner. There is an excellent bibliography that will make progress in the area particularly easy.

The existence of metalloenzymes and the occurrence of organometallic chemistry in some biological systems might encourage the organometallic chemist to expect some transformations of interest. However, the book

disappoints in this respect. There is an example of the compatibility of a racemic tricarbonylcyclopentadienyl-manganese aldehyde substrate with horse liver alcohol dehydrogenase, where enantioselective reduction leads to the (*R*)-alcohol and unreduced (*S*)-aldehyde. Brief mention is made of nitrile hydratases possessing cobalt or iron; of Zn^{II} acting as a Lewis acid at the catalytic site of HLDA or complexing to the substrate in class II aldolases; of a non-haem iron ω -hydroxylase; and of vanadium and manganese peroxidases. The catalytic cycle of cytochrome P450 mono-oxygenases is shown, indicating the various oxidation states of iron, and the catalytic cycle of the iron/haem-dependent peroxidases is also elaborated.

In summary, this book is a superb introduction to biotransformations for the synthetic organic chemist but it will be of very little interest to the practising organometallic chemist.

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