Book Reviews *

Esterification: Methods, Reactions and Applications. By J. Otera. Wiley VCH: Weinheim. 2003. 303 pp. £100. ISBN 3-527-30490-8

Professor Otera has included everything you need to know about esterification in one volume, focusing on the literature of the last 13 years (i.e. since 1990). In the first section on methodology (174 pp), the methods of synthesis of esters are elucidated, with subsections for each catalyst type, and experimental examples of each. In the second section on synthetic applications, kinetic resolutions (both enzymic and nonenzymic), asymmetric desymmetrisation, selective esterification of polyhydroxy compounds, new reaction media, and applications to natural product synthesis are covered. The final chapter in this section is on industrial uses (polyesters, oils and fats, soaps, emulsifiers, amino acid esters, flavours, and fragrances and pyrtethroids). A CD-ROM with a further 5000 references on esterification is included.

Although there is plenty of useful information in the book, I found it hard to find what I wanted. For example, if you need to know the best method of synthesising a certain ester, that may be in the book, but finding it may be more of a problem. Tables of results—as in an Organic Reactions chapter would have been useful as an Appendix.

For the industrial chemist, the last chapter will be a disappointment in that there is little detail on actual industrial methods, the equipment used, or scale-up issues. Perhaps a separate chapter by an author from industry, especially from the flavours and fragrances industry where the expertise lies, would have enhanced this section.

References are written in the style 2002 ACS 10000 rather than with superscripts. There is nothing wrong with this, except that it is easy to see that there are no references to any books or encyclopaedias. I would have expected some references to early reviews (e.g., *Comprehensive Organic Chemistry* by Barton and Ollis) or to Organic Reactions. Surprisingly, there are no references to *Chemical Reviews*; neither are there any references to patents, to the chemical engineering literature, nor to industrially orientated journals such as *Organic Process Research & Development* or *Industrial & Engineering Chemistry Research*.

My overall verdict is that this is a useful book, but it could have been so much better. Using a different (perhaps smaller) typeface for the experimental examples would have made it easier to skip over these and focus on the general text. This is not a work to read cover to cover—treat it more like an encyclopaedia or reference book, but with the limitations expressed above.

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Biocatalysis: Fundamentals and Applications. By Andreas S. Bommarius and Bettina Riebel. Wiley-VCH: Weinheim. 2004. 600 pp. £90/135 euro. ISBN 3-527-30344-8.

Over the past 15 years, there has been an explosion of interest in biocatalysis that has been lead mainly by enlightened synthetic organic chemists who have recognised that biological catalysts can do things that conventional chemical catalysts and reagents cannot. This surge in interest has been accompanied by the publication of a number of books dedicated to the field including contributions from eminent exponents of biocatalysis such as Roberts, Sheldon, Faber, Wong, and Whitesides. However, the format of these books clearly reflects the background of the authors as organic chemists in that they are organised according to the classes of reaction with very little discussion of the biology or process implications. In this new book, Bommarius and Riebel have managed to bring a new, and much overdue, perspective by focusing more on the biology and process issues of biocatalysis, areas that have received scant attention in most other texts in the field.

In 600 pages the book covers a huge area of technology and applications from fundamentals of enzyme kinetics, isolation of microorganisms, basics of gene cloning and bioinformatics through to reactor configurations and industrial applications. Throughout the book the fundamental scientific principles are treated with appropriate rigour whilst the experience that Bommarius gained in industry shows through with everything put nicely into a manufacturing context. Covering such a large subject area inevitably means that the depth of discussion of each area is limited, but there are plenty of references to guide those wishing to delve more deeply into a particular area. One of the author's stated aims was to bridge the gulf between basic texts and original research papers, and it has been successful in achieving this.

The content of the book is excellent, but the presentation could be better. Many of the figures are of poor quality and are difficult to read, and several different formats seem to have been used throughout the book suggesting that the figures have been "cut and pasted" from a range of sources. There are also some errors such as schemes referenced to the wrong section of text that should have been picked up during proof reading. Despite these minor criticisms, the book is excellent and could be read cover to cover or used for reference and I strongly recommend it to anyone interested in the field of biocatalysis whether they be graduate students just entering the field or more experienced practitioners.

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*Unsigned book reviews are by the Editor.

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