Book Reviews

Protecting Groups. By P. J. Kocienski. Thieme: Stuttgart, 1994, 260 pp., hardback DM 118. ISBN 3-13-137001-7. Paperback DM 60. ISBN 3-13-135601-4.

This book by a leading authority in synthetic organic chemistry is an up-to-date account of the use of the most common protecting groups, along with examples which illustrate their application to the synthesis of complex structures. Five major classes of protecting groups are covered – those used primarily for alcohols, diols, carboxylic acids, carbonyl compounds, and amines. Each group is discussed in terms of deprotection, methods of formation, and the NMR features which assist their characterization. Each chapter ends with a valuable compilation of reviews on the use of protecting groups.

The format of this book is quite different from that of the acknowledged classic in the field, Greene's "Protective Groups in Organic Synthesis",

now in its second edition. The Kocienski monograph is not a compendium and its coverage does not attempt to be comprehensive. For example, no mention is made of thiol protection. Rather, its focus is on specific applications of protecting groups, and the principles of protecting group chemistry are illustrated with a fascinating array of case studies from the contemporary literature. As a result, this is a more readable book than a typical reference source. The careful reader will be rewarded with insights, such as unexpected selectivity in deprotection that can result from the juxtaposition of functional groups or the operation of steric effects which can sometimes encumber the protection step, that are impossible to appreciate in the absence of a synthetic context. Here the examples are framed in terms of specific chemical transformations, lending a "real-life" aspect to the science of protection.

This is a book for the practicing synthetic organic chemist – right up to the most advanced level. Instant retrieval of information may not be as easy as with, for example, the Greene source, but the Kocienski book has greater didactic value. Consequently, a keen student of synthesis will find a good deal here that would be difficult to locate without an exhaustive knowledge of the synthetic literature.

Disraeli's words, cited at the head of the first chapter, that "Protection is not a principle, but an expedient" seems to reflect the opinion of most practitioners of synthesis. Given the prevailing view that the use of protecting groups is a necessary evil, this book removes much of the fear, mostly borne of uncertainty, associated with protecting group chemistry. It will be quickly apparent from even a casual scanning of this monograph that protecting groups are an indispensable part of the synthesis of polyfunctional molecules, and while we may cherish the hope that complex synthesis may one day be accomplished without this artifice, the blocking and unblocking of reactive functional groups continues to play a pivotal role in this activity. This is nicely illustrated in the final chapter of the book which discusses the Marburg synthesis of dihydroerythronolide A.

It seems inevitable that the use of protecting groups will become more extensive and it is likely that the broader field of organic synthesis will borrow organizing principles, such as the concept of orthogonal sets of protecting groups, from domains such as carbohydrate and peptide synthesis where protection has reached a high level of sophistication. The Kocienski book lays important groundwork for these advances and, at this point, offers the first and only systematic integration of protecting group strategy into the overall planning of a multistep synthesis.

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