Organic Process Research & Development **1998**, *2,* 433–434

Book Reviews

Named Organic Reactions. By Thomas Laue and Andreas Plagens (Trans. Claus Vogel). John Wiley & Sons: Chichester, UK, 1998. 288 pp. ISBN 0 471 97142 1. U.S. $69.95.

Named reactions are a *lingua franca* of organic chemistry and an important factor in the way we organise our thoughts about chemical transformations. Terms such as “Grignard”, “Diels−Alder”, and “Friedel−Crafts” instantly conjure up entire reaction schemes, with associated mechanisms and applications—these names are worth a thousand pictures, understood by chemists across the world. Other names in this collection (e.g., “Delépine”, “Dötz”, “Tiffeneau−Demjanov”) may be less universally known but still serve as a useful spur to curiosity.

This volume is a new translation of a work already into its second edition in Germany. Its 112 entries span 150 years of chemical innovation, from the Kolbe Nitrile Synthesis (1832) to the Sharpless Epoxidation (1980). A further 30 or so names are indexed as related reactions or variants. Thus, it is far from comprehensive; the equivalent list in the Merck Index (12th ed.) has over 400 such entries. Yet what this book lacks in coverage it makes up for in depth and readability. Each entry is treated in a consistent manner, with clearly-drawn structures and reaction schemes, a concise account of the scope of the procedure, the mechanism, and comparisons with alternative methods where appropriate. References are provided (ca. 6−7 per entry), not only to the publication where the method first appeared but also to review articles and accounts of recent applications—some as recent as 1997.

The criteria for inclusion are not completely clear. “The selection is based on their importance for modern preparative organic chemistry”, but this is inevitably a subjective judgment. With such a slim volume, there is not room for everything, and any reviewer could draw up a personal list of glaring omissions. I would have thought that the Jones and Swern oxidations merited a mention and that the Ritter reaction (omitted) was at least as widely used as the Perkin reaction (included). Even some old war-horses such as the Schotten−Baumann reaction fail to make this list.

Process development chemists planning to use these reactions on a large scale should be warned that the book takes little account of the associated hazards. For example, in the entry on chloromethylation (Blanc reaction), not only does it fail to warn of the dangers of the bis-chloromethyl ether side-product, but it actually cites this carcinogen as a possible alternative reagent.

Occasionally the text betrays its German origins; it would have benefited from tighter editing on this side of the Channel. But overall, this is an excellent little book, and a useful complement to traditional organic chemistry texts. Its size and style make it ideal for browsing while waiting for your reaction to finish, so it should earn its place on the laboratory bookshelf, not just in the main library.

Derek Robinson

OP9800616

10.1021/op9800616

Azolides in Organic Synthesis and Biochemistry. By H. A. Staab, H. Bauer, and K. M. Schneider. Wiley-VCH: Weinheim, Germany. 1998. 502 pp. ISBN 3-527-29314-0. £95.00.

This book is a timely review of the whole field of azolide chemistry by the inventor of this class of compounds (*N*,*N*′-carbonyldiimidazole was first described by H. A. Staab in *Angew. Chem.* **1956**, *68*, 754). Azolides are defined as compounds containing one or two pyrazole, imidazole, triazole, or tetrazole rings connected at the 1 position to a carbonyl, thiocarbonyl, or analogous group. The most common azolides encountered by synthetic chemists are *N*,*N*′-carbonyldiimidazole (CDI) and *N*,*N*′-thiocarbonyldiimidazole, both of which are available on an industrial scale. The versatility of these reagents stems from the relative ease of displacement of the azole group by nucleophiles, making them ideal for derivatisation of carbonyl and carboxyl derivatives under mild conditions.

The main chemical reactions of CDI and *N*,*N*′-thiocarbonyldiimidazole are as acyl transfer reagents, via an intermediate *N*-acyl-imidazole, and as carbonyl or thiocarbonyl transfer reagents, introducing a C═O or C═S group into a wide variety of substrates. Details of these reactions comprise the main part of the book, arranged by the functional group formed during the reaction. Another chapter considers the insertion of carbonyl or thiocarbonyl groups into difunctional compounds to give a wide range of heterocyclic ring systems. In these reactions, the azolides are convenient and often milder substitutes for the more toxic phosgene or thiophosgene. In addition, *N*,*N*′-thiocarbonyldiimidazole is used in reactions which make further use of the thiocarbonyl function, as in the elimination of thionocarbonates to olefins (Corey−Winter reaction) and in the free-radical deoxygenation of thionocarboxylates (Barton reaction).

The details of experimental procedures given in the earlier chapters are very welcome, and more of these would have been appreciated. The wealth of references, including some from 1997, give entry to the original literature and will be a source guide to synthetic chemists seeking new and more specific methods for functional group transformations in complex products.

The book will be of more interest to organic chemists than to biochemists. Biochemical applications are covered in two short chapters on peptide synthesis and immobilisation of proteins and enzymes and a longer section on phosphorylation of nucleosides and the preparation of oligonucleotides. The use of azolide reagents in the immobilisation of proteins and DNA, and in the manufacture of bio-sensors and biocompatible materials, is only covered briefly.

In conclusion, this book can be recommended as a source book to dip into for applications of this versatile class of reagents in the development of new synthetic processes.

J. Ian Grayson

OP980062Y
10.1021/op980062y