

**Modern Catalytic Methods for Organic Synthesis with Diazo Compounds.** Edited by M.P. Doyle, M.A. McKervey. Wiley, 1998, £100, ISBN 0471135569.

The clearly arranged and structured twelve chapters of the one volume book, written by highly competent authors, start always with a short historic or fundamental mechanistic introduction. This enables a broad variety of readers to understand the subsequent synthetic procedures and transformation reactions even without a special knowledge about the reactive behaviour of this not easy to handle class of compounds. For the preparation of diazomethane or diazoketones and diazoesters from commercially available precursors (including isotope labeled materials) a lot of methods are compared with regard to a simple availability, an easy experimental practicability and a high synthetic potential. Beyond that, the clearly outlined and detailed experimental procedures give valuable advice on the safe handling and the toxicology of the compounds so that the synthetic chemist should have no difficulties in reproducing these protocols. A lot of examples including natural substances and biologically active molecules are shown in every chapter followed by an detailed bibliography. The authors put special emphasis on the catalytic decomposition of diazo compounds to carbenes with different transition metal complexes. Specific features, the preparation and x-ray structures of a great number of catalysts are described and their synthetic potential is compared with special regard to asymmetric synthesis. Stereo- and regiochemical aspects of transition metal catalysed carbene insertion reactions in C-H (also in aromatic rings), Si-H and hetero-H-linkages, cyclopropanation and cycloaddition reactions finally leading to macrocyclic systems are discussed in detail and illustrated with a number of examples, which are an important aid for the planning of organic synthesis. The great versatility in the synthesis of natural products and the broad scope of catalytically generated sulfur-, nitrogen-, oxonium-, and carbonyl ylides derived from diazocarbonyl compounds is demonstrated and highlighted as well as a lot of illustrative applications of the Wolff-rearrangement and the homologation of carboxylic acids. Base promoted and acid catalysed reactions of diazocarbonyl compounds with aldehydes or ketones and their importance for C-C-bond formation are illustrated in numerous examples. The synthesis of multi ring- and bridged ring systems via  $\pi$ -route cyclisation of unsaturated or aromatic diazoketones and many other reactions complete this book. The successful comparison in each chapter of several transformation reactions under the influence of different catalysts and their stereochemical selectivities within enables the reader to use diazocarbonyl compounds as a potent synthetic tool to realize his own synthetic aims. Therefore, the book presents an inexhaustible source of encouragement for the synthetic chemist, especially if interested in the modern selective synthesis of natural products, as well as for the advanced student, who wants to know more of the fascinating chemistry of diazo compounds. It is "must" reading

for synthetic chemists and should not be missing in any chemistry library.

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**The Stille Reaction.** By V. Farina, V. Krishnamurthy, W.J. Scott. Wiley: 1998, softback. £ 38.95. ISBN 0471312738.

"The Stille Reaction" is a paperback reprint of the 50th anniversary volume of Organic Reactions originally published in 1997, and is devoted to the nowadays famous cross-coupling reaction. The first chapter (51 pages) consists of an analysis of the Stille reaction. The authors deliberately made the choice of conciseness, pointing out the main features of the reaction (mechanistic considerations, regiochemistry, stereochemistry).

The scope and limitations of the reaction are clearly drawn, following the nature of the electrophile or the organostannane used. The carbonylative coupling and tandem Heck-Stille reaction are briefly treated separately.

Importantly, main side reactions are listed, depending on the coupling conditions, (homocoupling, destannylation, electrophile reduction, product isomerisation) even though the mechanism is not yet fully understood. This will be of interest for any synthetic chemist who is not aware of the subtleties of the reaction. In the same way, few basic rules are given to help the reader in the choice of the experimental conditions (organotin reagent, substrate, catalyst, ligands, solvent, additives, work-up). These guidelines are happily completed with nine selected experimental standard procedures.

The third and major part of the book is a comprehensive tabular survey of every Stille coupling found in the literature from 1983 to 1995 (570 pages). This was indeed a particularly huge task for such a prolific reaction and led the authors to divide the tabular survey in thirty three separated tables following the nature of the electrophile and the type of the reaction (intramolecular, carbonylative or multi-steps cross-coupling). Inside each table, the ranking chosen by the authors is the listing of the electrophile in order of increasing carbon count and for a given electrophile, the stannane ranking follows the same rule so that the finding of a particular reaction remains quite easy and practical.

The coverage of the literature leads however to some comment as it cannot be considered anymore to be up-to-date. This is due to the fact that the original publication is now two years old, so that the bibliography is given up to the middle of 1995. Thus, recent and important developments for the Stille reaction (polymer grafted versions, new organotin reagents, nucleophilic activation when reaching hypervalent state of the organotin, extension to the Ni catalysis...) are under evaluated or totally missing.

This contrasts with the meticulous bibliographical work, covering the period up to the end of 1994, thus giving an impressive list of 900 references and fully demonstrates the importance of this reaction which would have merited a concise addendum including the aforementioned developments.

Independently, this book represents a major contribution to the palladium catalysed coupling reactions literature and will be the ideal start point for anyone wishing to deal with organotin based coupling reactions. Moreover, the

editor's policy favouring this lower-priced soft cover edition has to be encouraged and allows this book to be recommended for any organic chemistry laboratories as well as for personal use.

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