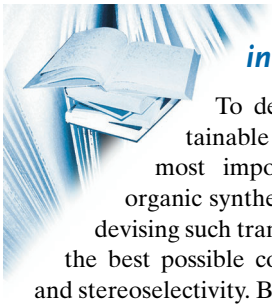

Directed Selectivity in Organic Synthesis

To develop efficient and sustainable reactions is one of the most important tasks of modern organic synthesis. An important aim in devising such transformations is to achieve the best possible control of chemo-, regio-, and stereoselectivity. Because of the importance of this topic, it is not surprising that there are already many textbooks and reviews dealing with the subject. In their book *Directed Selectivity in Organic Synthesis*, the authors Tanja Gaich and the late Ekkehard Winterfeld have chosen a completely different focus: they describe strategies for the directed generation of diverse regio- and/or stereoisomeric products from a single starting material, for example by variations of reagents, reaction conditions, or the exact order within a reaction sequence.

The book is divided into four chapters. In Chapter 1 the authors describe general concepts and methods to achieve selectivity in organic synthesis. In the subchapters on chemo-, regio-, stereo-, and enantioselectivity, the reader is briefly introduced to the principles of active control versus passive control (e.g., charge stabilization versus the steric demand of silyl groups), kinetic versus thermodynamic reaction control, the HSAB concept, and other important aspects. In Chapters 2–4, directed selectivity is treated in greater detail, classified according to the functionalities to be modified, and illustrated in each case by a large number of instructive examples from the original literature. Chapter 2 deals with transformations of acetylenes and alkenes, for example by oxidative or reductive transformations, cycloaddition reactions, sigmatropic rearrangements, transition-metal-catalyzed processes such as metathesis, and cyclization reactions. Chapter 3 is devoted to the directed modification of carbonyl compounds. This includes, inter alia, transformations of electrophilic carbonyls, conjugate additions, and enolate chemistry, as well as a number of other important reactions. In the concluding Chapter 4, sp^3-hybridized substrates are discussed, in particular including epoxides, acetals, ethers, and alcohols. Because of the huge amount of available data on directed selectivity in the literature, the authors understandably had to focus the discussion on a personal selection of topics, and therefore have mostly omitted, for example, catalytic enantioselective transformations, and selectivity in the context of aromatic or heteroaromatic compounds.

Overall, the book stands out by virtue of its descriptions of an enormous number of example reactions that help the reader gain a deep insight into the diversity of options for controlling selectivity. However, the quality of the presentation, with regard to both content and graphics, varies between the individual chapters. In Chapter 1, a more detailed introduction to the basic concepts of controlling selectivity would have been desirable. In Chapter 2, the reader is given a large amount of data about selective reactions, but there is not enough interpretation or explanation of mechanisms. Also, there are a number of minor mistakes and inaccuracies. For example, there is no consistent style or size of the drawings, data on yields and product ratios—which would be desirable in a discussion of selectivity—are missing and the figures lack explanatory captions. This is unfortunate, as all these aspects are covered perfectly in Chapter 3, which contains informative and well-presented figures with all necessary information, as well as comprehensive explanations about the observed selectivities, both in the text and by appropriate drawings. All the subchapters of Chapter 3 have a clear structure and are very well written. Besides presenting much interesting data, this chapter thus manages to provide a good understanding of the material, and thus fulfils readers' expectations of a modern textbook.

Taken together, this first edition of *Directed Selectivity in Organic Synthesis* is a highly interesting book with a broad and diverse content. Because of the partial lack of sufficient mechanistic explanations, it is only conditionally suitable as a textbook. However, with the large number of practical examples from the original literature it is certainly a valuable reference source for chemists at the graduate level and beyond.

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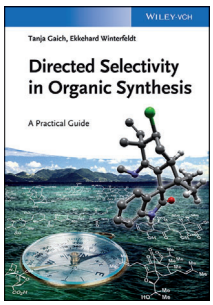

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