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Book review

Carbohydrate building blocks, Mikael Bols, Wiley, New York, 1996, ISBN 0-471-13339-6, Price £40.00.

The monograph does not represent a text book for carbohydrate chemistry but rather a guide for those who wish to apply the most easily accessible chiral building blocks derived from saccharides for various synthetic applications. Further, this contribution does not claim to compete with the most frequently cited, somewhat classical book of Stephen Hanessian (*Total Synthesis of Natural Products: The Chiron Approach*, Pergamon, Oxford, 1983) in which highly demanding multistep syntheses of most complex natural products were discussed based on selected carbohydrate precursors. Whereas the "born" carbohydrate chemist could easily follow the initial steps, the non-carbohydrate readers had to start with a lot of homework.

At this stage the present text of Mikael Bols comes into the game in that these "simple" early steps of syntheses are rationalized, elaborated and described in detail. In a lucidly written short introduction the author asks the questions why, when and how to use carbohydrates and then sheds some light on the structure of this book. Chapter 1 describes the starting materials, their availability and costs and also their use for the most efficient formation of up to four stereogenic centers. The following Chapters 2–11 in a quite condensed and selected form list straightforward transformations in carbohydrate synthesis. Protecting group chemistry (e.g. acetalation, acylation, alkylation), redox reactions, eliminations and rearrangements are outlined in those cases which effectively lead to useful starting materials in convincing yield. Even though these chapters are quite short, the basic rules including special features such as relative reactivities of functional groups can be appreciated also by non-specialists. The subsequent section, the "compendium", lists about 700 chiral building blocks (synthetic equivalents) derived from carbohydrates with their chemical abstract number, a reference and the number of steps based on a starting sugar. There are ample references—in particular also very useful older citations are given—which allow to check the primary papers. As very advantageous for retrosynthetic work the "stereochemical index" should prove in which an open-chain depiction of up to seven stereogenic centers with oxygen, hetero and carbon substitution are correlated to the previous sections. Some other short correlations may be useful, however, the final subject index seems to be much too meager. For those scientists who are unfamiliar with the area, and who do not want to dive deeply into the book but rather find a quick solution to an immediate problem a considerably extended number of names and code words would be desirable.

As expected in such a book some flaws in drawings and references are observed, and in addition to an extended subject index the total yield of the building blocks would be appreciated. The consequent Mill's depiction of all carbohydrate structure is considered to be most appropriate with regard to the majority of non-carbohydrate users and at the same time will contribute to training of the carbohydrate people.

In summarizing, the reviewer would certainly highly recommend *Carbohydrate Building Blocks* for every group involved in the synthesis of complex products from enantiomerically pure and facily accessible carbohydrate starting material. However, it should be emphasized that another

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market will most likely be carbohydrate groups, in which the knowledge is principally "at hand", however, this does not necessarily mean in all the various areas of components covered here, and moreover certainly not for the very fresh (graduate) students. Therefore, this book should be a valuable companion of the practising synthetic chemist at the bench.

J. Thiem
Hamburg University, Germany