The Organic Chemistry of Sugars, D. E. Levy and P. Fügedi (Eds.), CRC Press/Taylor & Francis: Boca Raton, USA, **2005**, hardcover, 880 pp, £120/$209.95, ISBN 0-8247-5355-0

Well-made textbook on the chemistry of sugars!

Since carbohydrates play a crucial role in cellular interactions and addressing, many recent aspects in life science, for example glycobiology or modern biochemistry, rely on the knowledge of organic chemistry of sugars. The structural and, in particular, stereochemical diversity of these moieties with their crowded functional groups create a vast and confusing topic for most chemists. Carbohydrates show different chemical behaviour because the densely located functional groups have a strong mutual influence on the individual reactivities.

Levy and Fügedi, two distinguished experts on the chemistry of sugars, have edited a book on this particular topic. The well-made monograph has a clear textbook style, and all chapters are balanced in their contents. It covers the basics as well as the cutting-edge developments in the chemistry of sugars, such that a non-experienced synthetically oriented chemist will have no problems in understanding. Consequently, it addresses a broad community of scientists, from graduate students to more established researchers.

The book consists of 15 contributions that are organized in four major sections. The first part of the textbook includes five chapters, covering historical aspects, fundamental structures as well as reactivity, nomenclature and basic principles in carbohydrate chemistry. In particular, the second chapter is devoted to the configuration and conformation of mono- and oligosaccharides. All important concepts, for example the anomeric and *exo*-anomeric effects, are treated in detail. The third chapter surveys the manipulations of protective groups on carbohydrates. Since this is by far the most time-consuming aspect of preparative organic sugar chemistry, the contribution is too short and lacks mechanistic rationales for some experimental findings. The next chapter focuses on glycosylation reactions. The review covers all important methods and, moreover, provides within detailed tables an organized access to the corresponding references. The following contribution deals with oligosaccharide synthesis. The different strategies are precisely outlined and the most recent developments – like sequential one-pot protocols and automated solid-phase synthesis for oligosaccharides – are described in detail. The next four chapters make up the second part of the book and are devoted to sugar-like structures. A variety of chemical manipulations on sugars allow the construction of architectures which are primarily not considered as sugars. Individual contributions treat *C*-glycosides, carbasugars, iminosugars, and related species. Since several carbohydrates are available in large quantities and exclusive optical purity, exploiting these natural products as chiral pool has a long tradition. Therefore, chapter 10 discusses their use as chiral auxiliaries. The subsequent large chapter surveys the synthesis of complex, sugar-derived, enantiomerically pure molecular architectures. The total synthesis of sugar-containing natural products and the *de novo* synthesis of carbohydrates are treated in the next two chapters. The last section of the book, consisting of three chapters, is devoted to various aspects of glycoscience. In the reports on combinatorial approaches in carbohydrate chemistry and the preparation of glycopeptides, some recent developments are not covered, whereas the last contribution provides a comprehensive survey on carbohydrate mimetics as therapeutic agents.

The book was very carefully made: because of the large index, the reader will have no problem in finding a specific subject; the schemes are clearly arranged, and the numbering is systematic; typos in the written part and the schemes are rare. The literature coverage depends strongly on the individual chapters, but most reports give a survey up to 2003.

In summary, this monograph provides an excellent entry and survey over the recent developments as well as frontiers in organic sugar chemistry. The monograph will probably advance towards a textbook for sugar chemistry. For the interested scientist working in these areas and for the synthetically oriented chemist, it will be a compulsory reading. Therefore, this valuable book will have its definite place in every good scientific library.

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SYNTHESIS 2007, No. 3, pp 484–484
Advanced online publication: 25.01.2007
Art ID: B20307SS