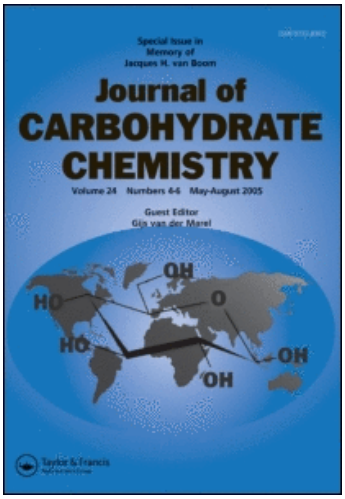

Journal of Carbohydrate Chemistry
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713617200

A review of: "Topics in Current Chemistry, *J. Thiem, Ed.* Springer-Verlag: Berlin, Heidelberg and New York, 1990, 334 p, $99.50. ISBN 3-540-51576-3."

Roger W. Binkley[a]
[a] Department of Chemistry Cleveland, State University, Cleveland, Ohio

To cite this Article Binkley, Roger W.(1992) 'A review of: "Topics in Current Chemistry, *J. Thiem, Ed.* Springer-Verlag: Berlin, Heidelberg and New York, 1990, 334 p, $99.50. ISBN 3-540-51576-3."', Journal of Carbohydrate Chemistry, 11: 4, 537 — 538
To link to this Article: DOI: 10.1080/07328309208017813
URL: http://dx.doi.org/10.1080/07328309208017813

J. CARBOHYDRATE CHEMISTRY, 11(4), 537-538 (1992)

BOOK REVIEW

Topics in Current Chemistry, J. Thiem, Ed. Springer-Verlag: Berlin, Heidelberg and New York, 1990, 334 p, $99.50. ISBN 3-540-51576-3.

This book contains chapters on a collection of topics related to carbohydrate chemistry. Subjects discussed include the synthesis of oligosaccharides, photochemical reactions of sugars, conformational analysis of oligosaccharides, methods for regioselective protection of monosaccharides, and the chemistry of pseudo-sugars. The primary goal of the book appears to be to concisely review published work in a particular area, rather than to provide an introduction for non-experts.

The first chapter, which has the title "Synthesis of Oligosaccharides Related to Bacterial O-Antigens", begins with general information about *O*-polysaccharide structure and proceeds to describe synthetic work on *Salmonella* oligosaccharides, *Shigella* antigens, antigenic determinants of *E. coli*, and *Brucella* oligosaccharides. Contained in this chapter is an extensive cataloging of oligosaccharides which have been synthesized and descriptions of the reagents used for these syntheses.

In chapter two "Synthetic Saccharide Photochemistry" a number of photochemical reactions which might find synthetic application are described. Discussion is included of processes which accomplish the following reactions: substitution, addition, reduction, oxidation, and protecting group removal. Also considered are photoreactions of keto sugars. Some mechanistic interpretation is provided. Even with the large amount of effort invested in the study of photochemical reactions of carbohydrates, no particular process "stands out" as having had a significant impact on synthetic carbohydrate chemistry.

The third chapter on "Synthesis of Glycolipids" contains descriptions of the syntheses of the oligosaccharide portions of glycolipids as well as those syntheses of the lipid portions which involved the use of carbohydrates. In the latter category, the synthesis of sphingosine bases is discussed. This is followed by descriptions of the syntheses of monoglycosyl and diglycosyl ceramides, glycosphingolipids containing *N*-acetylgalactosamine, sialic acid-containing glycosphingolipids, and *myo*-inositol-containing glycolipids. The focus of this chapter is primarily on research done in the past ten years.

Chapter four has the title "Conformational Aspects of Oligosaccharides". In this chapter the first topic discussed is methods of determining oligosaccharide conformation. These include nuclear magnetic resonance, X-ray analysis, and optical spectroscopy. The major portion of the chapter is concerned with theoretical calculations. Applications to the following types of molecules are discussed: monosaccharides, disaccharides, blood group antigens, glycoproteins, glycolipids, and various types of antibiotics. This chapter contains excellent pictures of space filling models of complicated oligosaccharides.

In the fifth chapter, "Preparation of Selectively Alkylated Saccharides as Synthetic Intermediates", the various methods for regioselective synthesis of benzyl, allyl, and triphenylmethyl ethers of monosaccharides are described. Also included are much briefer discussions of methods for removal of these protecting groups. In the final few pages of this chapter attention is drawn to regioselective formation of silyl ethers. Much information is provided about the yields of partially protected sugars formed under various conditions but little discussion is given of the rationale for regioselectivity. Other chapters in this book concerned with synthesis are written for a rather specialized audience but this chapter contains information which would be of general value to almost all synthetic carbohydrate chemists.

"Chemistry of Pseudo-Sugars" is the title of chapter six. In this chapter the syntheses for the sixteen possible "pseudo-sugars" are described. (Pseudo-sugar refers to compounds in which a ring oxygen is replaced by a methylene group and, in this review, is restricted to pseudo

hexopyranoses). Two basic methods for synthesis of these compounds are described. The first depends upon the Diels-Alder adduct formed between furan and acrylic acid. Since this compound can be easily resolved, the Diels-Alder adduct approach also is used to produce enantiomeric pseudo-sugars. The second method involves modification of true sugars. The reactions involved in these syntheses are adequately described with sufficient illustrations to make the chapter quite readable.

The final chapter has the title "Syntheses of Deoxy Oligosaccharides" and describes work on 2-deoxyglycosides, anthracycline antibiotics, aureolic acids, cardiac glycosides, and orthosomycine antibiotics. This chapter is notable in terms of the mechanistic discussion which accompanies and complements the synthetic presentation. The natural focus of the research described is on the steroselective syntheses of oligosaccharides and the particular challenges placed on such sysnthetic work when 2-deoxy sugars are involved.

It is difficult to recommend this book to a particular audience because the topics covered arise from a broad spectrum of carbohydrate chemistry; that is, there is no particular theme to the book. It is also not easy to suggest this book to persons interested in general information and background in carbohydrate chemistry since, for most of the chapters, a familiarity is needed with the topics being discused in order for them to be read with reasonable ease. This book seems to be best described as a collection of review articles each of which would be primarily of interest to a person working in a particular area. This analysis leads to the conclusion that the research library is the best location for such a text; that is, a place where researchers could find and read a chapter of interest.

The book is physically attractive and the chapters are extensively referenced, but there are a sufficient number of errors and awkward sentence construction to cause confusion at times. Some of these errors, such as the misspelling of "acetal" on page 10 and "enantiomeric" on page 282, seem to result from a lack of proper proof reading. Others appear to result from problems in the printing process; for example, the first paragraph in chapter two has lines repeated and scrambled to such an extent that real effort is needed to decipher the meaning of the paragraph.

Roger W. Binkley
Department of Chemistry
Cleveland State University
Cleveland, Ohio 44115