

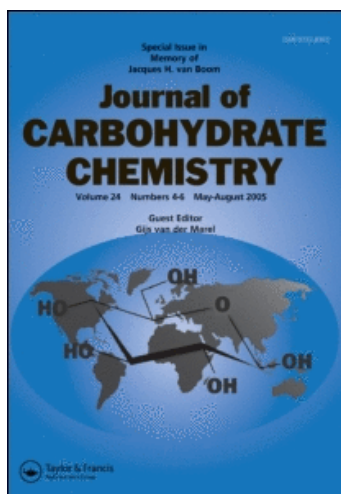
This article was downloaded by:

On: 23 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal of Carbohydrate Chemistry

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713617200>

The Chemistry of C-Glycosides

Zbigniew J. Witczak^a

^a School of Pharmacy, U-92 University of Connecticut, Storrs, CT, U.S.A.

To cite this Article Witczak, Zbigniew J.(1996) 'The Chemistry of C-Glycosides', *Journal of Carbohydrate Chemistry*, 15: 5, 651 – 652

To link to this Article: DOI: 10.1080/07328309608005682

URL: <http://dx.doi.org/10.1080/07328309608005682>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

BOOK REVIEW

The Chemistry of C-Glycosides. By Daniel E. Levy and Cho Tang, Pergamon- Elsevier Science Ltd. Oxford, 1995, 291pp. Paperback ISBN 00842081-8, \$ 48.00 in USA/Outside USA, £ 30.00. Hardbound ISBN 00804080-X, \$ 115.00 in USA/Outside USA. £ 70.00.

This is Volume No. 13 of Tetrahedron Organic Chemistry Series. This book on the chemistry of C-glycosides, consisting of eight chapters, is an extensive compilation of new developments in the growing field of the synthetic C-glycoside chemistry. The authors are to be congratulated for drawing together these new developments in an extremely comprehensive and easily readable layout.

The first chapter entitled "Introduction" deals with nomenclature, physical properties, anomeric effects, H-bonding capabilities, stabilities and conformations of C-glycosides, comparing them with O-glycosides. Additionally C-glycosides as stable pharmacophores, are also discussed here, along with the introductory information on preliminary biological and practical applications of C-glycosides. The chapter serves as a fundamental introduction to the biochemistry of this fascinating group of carbohydrates.

Chapter 2, as one of the longest and most important, describes "Electrophilic Substitutions" and is divided into thirteen sections. The first few describe cyanation, alkylation, allenylation, allylation and alkynylation reactions. The next section describes various arylation reactions. Reactions with enol ethers, enamines and allylic ethers are also presented. The last two sections are referred to as reactions involving anomeric carbenes and exoanomeric methylenes.

Chapter 3 deals with "Nucleophilic Sugar Substitutions" describing the use of C1 lithiated carbanions by direct metal exchange, C1 lithiated anomeric carbanions by reduction, and C1 carbanions stabilized by sulfones, sulfides, sulfoxides, carbonyl and nitro groups.

Chapter 4, entitled, "Transition Metal Mediated C-glycosidations", describes direct coupling of glycols and aryl groups, coupling of substituted glycols with aryl groups, and coupling of P-allyl complexes of glycols. This chapter has a very informative addendum dealing with mechanistic considerations.

Chapter 5, as one of the most important deals with "Anomeric Radicals" through free radical, Wittig and Friedel-Crafts approaches. Methods presented here include nucleophilic additions and one carbon chain elongation *via* aldehydes and nitriles.

Chapter 6 describes "Rearrangements and Cycloadditions", through substituent cleavage and recombination, including Wittig and carbenoid rearrangements. In the electrocyclic rearrangements involving glycols, the sigmatropic and Claisen variants are also discussed. Under the subchapter "Manipulations of C-Glycosides", examples of Knoevenagel condensations and 1,3-dipolar cycloadditions are reported.

Chapter 7 of the book is concerned primarily with strategies for the "Sugar Ring Formations" through base, halogen and metal mediated Wittig reactions of lactols followed by ring closures, addition of Grignard and organozinc reagents to lactols. The cyclization of substituted polyols *via* ether, ketal and halide displacements are also reported. Also included are various types of rearrangements, such as electrocyclic and ring contractions. The chapter also discusses cycloaddition and other methods of formation, including cyclization of halolefins and enynes.

The final chapter (Chapter 8) describes "Synthesis of C-Di- and Trisaccharides", and reviews almost all the syntheses of C-glycosides reported between 1983 and 1994. Synthetic trends of the future for this class of compounds are briefly discussed in this chapter.

The book concludes with an extensive (12 pages) subject index. Some chapters show some spelling errors and it is unfortunate that final editing was unable to correct some mistakes, such as double or triple spelling of the frequently cited names of Aebisher, Acbischer, Aebischer, and Acbisher, Holzapfel and Holzaphel, De Mesmaecker and Mesmaekerm, Sinnaÿ and Sinaÿ, Scholkpf, etc. Schemes 2.2.16 and 2.2.17 are incorrectly titled.

In spite of these typographical shortcomings, this book will provide a highly valuable reference to the field. It will be an essential addition to institutional, as well as personal libraries of organic and medicinal chemists, biochemists actively engaged in research on the chemistry and biochemistry of carbohydrates.

Zbigniew J. Witczak
School of Pharmacy, U-92
University of Connecticut,
Storrs, CT 06269, U.S.A.