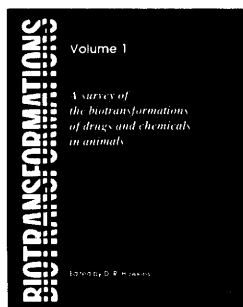


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Volume 1

Edited by David R. Hawkins, *Huntingdon Research Centre*



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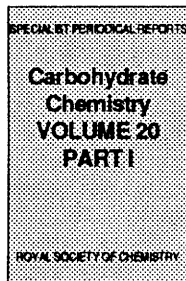
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CARBOHYDRATE CHEMISTRY

Vol. 20 Part I

Senior Reporter: Neil R. Williams, *Birkbeck College, University of London*



Since Volume 14 *Carbohydrate Chemistry* has been divided into two parts: Part I – Mono-, Di-, and Tri-saccharides and their derivatives. Part 2 – Macromolecules.

From Volume 19, Part I was renamed: Monosaccharides, Disaccharides, and Specific Oligosaccharides.

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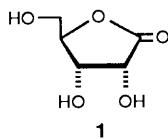
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D-Ribonolactone

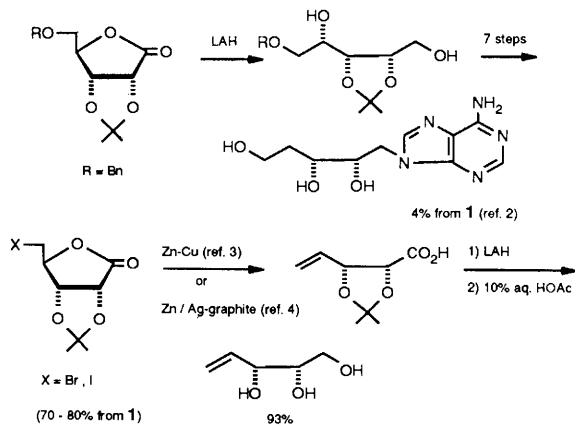
Chiral Cornerstone



D-(+)-Ribonic γ -lactone (**1**, D-ribonolactone), a chiral cornerstone of many asymmetric synthetic strategies, is again available from Aldrich. A thorough review of its chemistry and role in organic synthesis, especially in the construction of important natural products such as (-)-ranunculin, (-)-neplanomycin A and lasalocid A, was published a few years ago.¹ Examination of the more recent literature reveals its continuing pivotal role in the preparation of chiral acyclics, chiral cyclopentenones and oxabicyclic systems, key intermediates of biologically important molecules. The following paragraphs highlight some recent synthetic applications germane to these areas.

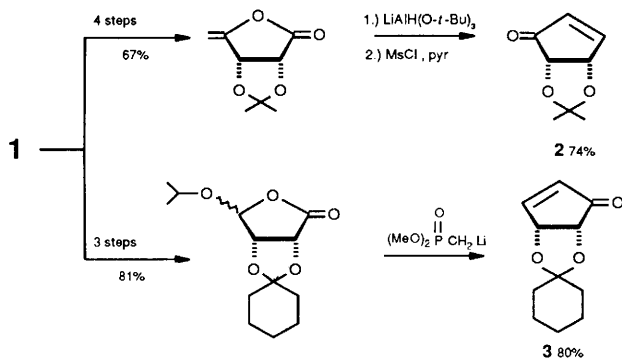
Chiral Acyclics:

Reductive cleavage of the lactone ring system is a useful strategy for chirality transfer of the ring vicinal diol moiety to an acyclic system.



Chiral Cyclopentenones:

D-Ribonolactone is a convenient source of chiral cyclopentenones **2**⁵ and **3**^{6,7} which are useful intermediates for the synthesis of prostanoids and carbocyclic nucleosides.

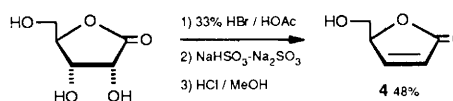


Johnson and Penning⁸ have used **2** in a remarkably efficient synthesis of (-)-PGE₂ methyl ester. Borchardt⁹ and coworkers em-

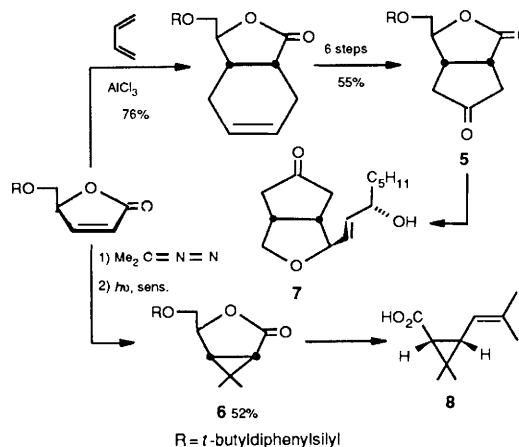
ployed **3** in a recent synthesis of (-)-aristeromycin, a carbocyclic nucleoside analog with antiviral and cytotoxic activity.

Chiral Oxabicyclic Systems:

D-Ribonolactone (**1**) is also a convenient source of 2(5*H*)-furanone **4**^{10,13} as most recently demonstrated by Godefroi and co-workers.¹⁰ Less recent syntheses of **4** from **1** were developed by Font¹¹ and Ireland.¹² This furanone is also a recent addition to our listings.



Mann and co-workers¹⁴ have demonstrated that chiral oxabicyclic systems **5** and **6** are readily obtainable from **4** and show great potential as synthons for prostacyclin analogs (*e.g.*, **7**) and *cis*-chrysanthemic acid¹⁵ derivatives (*e.g.*, **8**).



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