

Contents

1	Introduction	1
2	Free Sugars	2
	Synthesis	2
	Physical Measurements	6
	Isomerization	9
	Oxidation	10
	Other Aspects	11
3	Glycosides and Disaccharides	15
	O-Glycosides	15
	Synthesis of Monosaccharide Glycosides	15
	Synthesis of Disaccharides and Their Derivatives	19
	O-Glycosides Isolated from Natural Products	25
	Hydrolysis and Other Reactions and Features	26
	S-Glycosides	29
	C-Glycosides	30
	Pyranoid Compounds	30
	Furanoid Compounds	35
	Glycosides Isolated from Natural Sources	38
4	Oligosaccharides	44
	General	44
	Trisaccharides	46
	Linear Heterotrisaccharides	47
	Branched Heterotrisaccharides	48
	Tetrasaccharides	48
	Linear Tetrasaccharides	48
	Branched Tetrasaccharides	49
	Higher Oligosaccharides	50
	Pentasaccharides	50
	Hexasaccharides	50
	Higher Saccharides	51
5	Ethers and Anhydro-sugars	54
	Ethers	54
	Methyl Ethers	54
	Other Alkyl and Aryl Ethers	54
	Silyl Ethers	57
	Intramolecular Ethers (Anhydro-sugars)	58
	Oxirans	58
	Other Anhydrides	59
6	Acetals	63
	Isopropylidene Acetals	63
	Benzylidene Acetals	64
	Other Acetals	65

7	Esters	67
	Acetates	67
	Benzoates	69
	Other Carboxylic Esters	70
	Sulphonates	74
	Sulphates, Sulphites, and Related Esters	75
	Phosphates, Phosphites, and Related Esters	76
	Other Esters	78
8	Halogeno-sugars	81
9	Amino-sugars	90
	Natural Products	90
	Synthesis	90
	Reactions	97
	Di- and Tri-amino-sugars	101
10	Miscellaneous Nitrogen Derivatives	104
	Glycosylamines	104
	Azido-sugars	106
	Nitro-sugars	106
	Nitriles and Hydroxylamines	108
	Hydrazones, Osazones, and Derived Heterocycles	108
	Other Heterocyclic Derivatives	111
11	Thio-sugars	116
12	Deoxy-sugars	120
13	Unsaturated Derivatives	125
	Glycals	
	Other Unsaturated Derivatives	127
14	Branched-chain Sugars	131
	Sugars Containing an R-C-OH Branch ₁	131
	Compounds Containing an R-C-H or R ¹ -C-R ² Branch	135
	Sugars Containing an R-C-N Branch	139
	General	139
15	Aldosuloses, Dialdoses, and Diuloses	141
	Aldosuloses	141
	Dialdoses	143
	Diuloses	144
16	Sugar Acids and Lactones	146
	Aldonic Acids	146
	Aldaric Acids	148
	Ulosonic Acids	148
	Uronic Acids	149
	Ascorbic Acids	150
17	Inorganic Derivatives	154
	Carbon-bonded Phosphorus Derivatives	154
	Other Carbon-bonded Compounds	156
	Oxygen-bonded Compounds	157
18	Alditols and Cyclitols	159
	Alditols	159
	Cyclitols	164

19	Antibiotics	171
	Aminoglycoside Antibiotics	171
	Macrolide Antibiotics	175
	Anthracycline Antibiotics	176
	Nucleoside Antibiotics	178
	Miscellaneous Antibiotics	180
20	Nucleosides	186
	General	186
	Synthesis	186
	Anhydro- and Cyclo-nucleosides	187
	Deoxy-nucleosides	189
	Halo-nucleosides	191
	Amino- and Nitrogen-substituted Nucleosides	191
	Thio-nucleosides	193
	Unsaturated Nucleosides	193
	Branched-chain Nucleosides	194
	Keto- and Uronic Acid Nucleosides	194
	C-Nucleosides	195
	Miscellaneous Nucleosides	198
	Ether Derivatives	198
	Ester Derivatives	199
	Phosphorus Derivatives	200
	Reactions	200
	Spectroscopic and Other Physical Measurements	201
21	N.M.R. Spectroscopy and Conformational Features	205
	Theoretical and General Considerations	205
	Acyclic Sugar Derivatives	207
	Furanose Systems	207
	Pyranose Systems	209
	Oligo- and Poly-saccharides	211
	Glycopeptides	214
	Inorganic Complexes	214
	N.M.R. Spectroscopy of Other Nuclei	215
22	Other Physical Methods	219
	I.R. Spectroscopy	219
	Mass Spectrometry	219
	X-Ray and Neutron-diffraction Crystallography	221
	Free Sugars and Simple Derivatives Thereof	221
	Glycosides and Derivatives Thereof	221
	Di- and Tri-saccharides and Derivatives Thereof	222
	Halogen-, Nitrogen-, and Phosphorus-containing Compounds	222
	Unsaturated Compounds	223
	Anhydro-compounds	223
	Acid Derivatives	223
	Alditols and Cyclitols	224
	Nucleosides, Nucleotides, Derivatives, and Related Compounds	224
	Antibiotic	225
	E.S.R. Spectroscopy	225
23	Separatory and Analytical Methods	229
	Chromatographic Methods	229
	General	229
	Gas-Liquid Chromatography	229
	Thin-layer Chromatography	232
	High-pressure Liquid Chromatography	232

	Column Chromatography	239
	Electrophoresis	239
	Other Analytical Methods	239
24	Synthesis of Enantiomerically Pure Non-carbohydrate Compounds	244
	Antibiotics and Their Components	244
	Prostanoids	249
	Alkaloids	250
	Miscellaneous Compounds	251
	Author Index	257