EDITORIAL REPORT ON NOMENCLATURE, 1962.

1. Nomenclature of Carbohydrates

A revision and slight extension of the U.S.–British Rules of Carbohydrate Nomenclature, 1952 (given in Chapter 5 of " Handbook for Chemical Society Authors, 1961 ") has been agreed between the appropriate U.S. and British Committees, and accepted by the Chemical Society and the American Chemical Society for use in their respective periodicals. The new rules will form the basis of the chapter on carbohydrate nomenclature in any future revision of the " Handbook "; most of the revisions are verbal, to remove ambiguities, and have no effect on the resulting nomenclature. The following major changes and additions should, however, be noted.

Rule 7 [This rule, describing the naming of ketoses by the use of the termination " ulose," has been extended by the following additions.] A sugar which is both an aldose and a ketose will be named by replacing the final " e " in the name of the (formally) parent aldose by the suffix " -ulose," preceded by the appropriate position numeral, and then adding the appropriate configurational prefixes.

Ketoses having two ketonic carbonyl groups will be named by means of the suffix " -diulose "; before this will be placed a prefix denoting the number of carbon atoms in the chain, which, in turn, will be preceded by the numerals designating the positions of the carbonyl groups and the prefix denoting the configuration of the group of asymmetric centres present (see Rule 6).

Examples:

(*a*) Permissible trivial names established by usage:

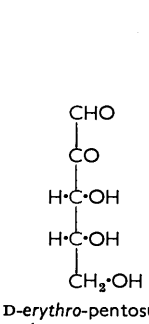
D-fructose for D-*arabino*-hexulose, D-psicose for D-*ribo*-hexulose, D-sorbose for D-*xylo*-hexulose, D-tagatose for D-*lyxo*-hexulose, and the corresponding names for the L-forms; sedoheptulose for D-*altro*-heptulose.

(*b*) Names that cannot be used as definite names, because they have incorrect structural implications:

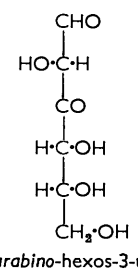
glycerulose (for 1,3-dihydroxy-2-propanone), D-erythrulose or D-threulose (for D-*glycero*-tetrulose), D-arabinulose or D-ribulose (for D-*erythro*-pentulose), D-lyxulose or D-xylulose (for D-*threo*-pentulose), and the corresponding names for the L-forms.

(*c*) [This section lists the previously published examples.]

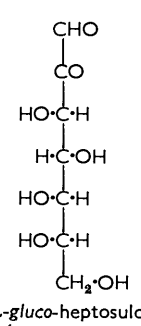
(*d*)



D-*erythro*-pentosulose (common name: D-arabinosone)

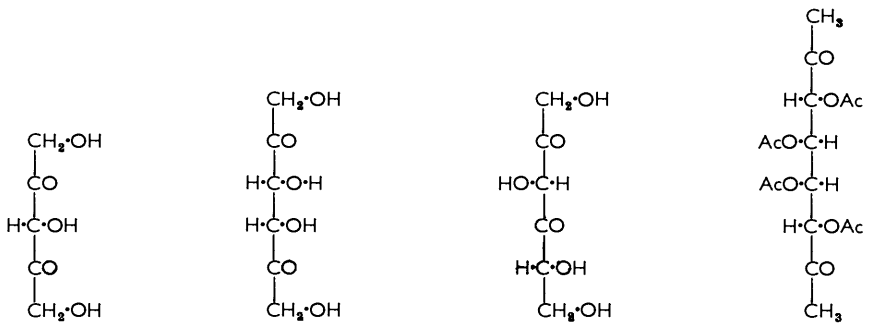


D-*arabino*-hexos-3-ulose



L-*gluco*-heptosulose (common name: L-glucoheptosone)

(*e*)



glycero-2,4-pentodiulose | *erythro*-2,5-hexodiulose | D-*threo*-2,4-hexodiulose (not D-*threo*-3,5-hexodiulose) | tetra-*O*-acetyl-1,8-dideoxy-*galacto*-2,7-octodiulose

Rule 17 [The prefixes *aldehydo* and *keto* are now to be italicized.]

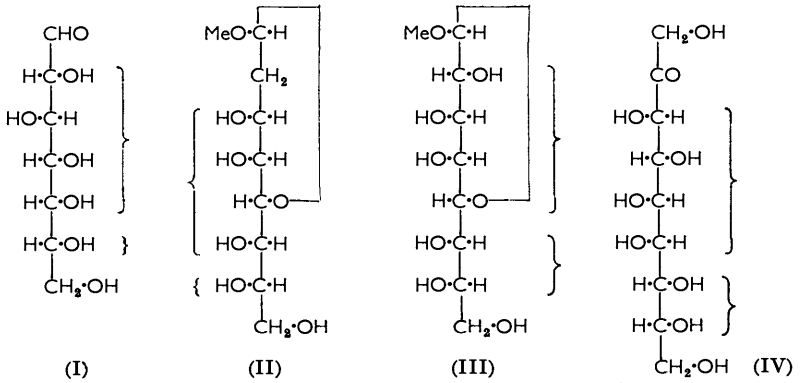
Rule 20 [The nomenclature of glycosides has been restricted by redefinition to:] a glycoside is a mixed acetal resulting from the exchange of an ***alkyl or aryl*** radical for the hydrogen atom of the hemiacetal hydroxyl group of a cyclic form of an aldose or ketose.

Rule 22 [This rule has been re-drafted and is therefore now given in full.] A monosaccharide containing more than four configurational asymmetric carbon atoms will be named by adding two or more prefixes, indicating the configurations of those asymmetric carbon atoms, to a root indicating the number of carbon atoms in the chain and ending with the suffix " -ose " for aldoses and " -ulose " for ketoses.

The configurational prefixes employed are given in Rule 6. For the aldoses and 2-ketoses, the sequence of asymmetric carbon atoms will be divided into units, commencing, with a unit of four asymmetric carbon atoms, at the asymmetric carbon atom next to the functional group (see below). The order of citation of these prefixes will commence at the end farthest from carbon atom number one, and proceed along the carbon chain to the asymmetric carbon atom nearest to carbon atom number one. In designating the anomeric ring forms of these aldoses and 2-ketoses, the anomeric prefix here (see Rule 15) will immediately precede the configurational prefix for that group of asymmetric carbon atoms, next to the functional group, which has one or more atoms involved in the ring.

Number of asymmetric carbons in the sequence	Prefixes to be used	
	Order of selection	Order of citation
5	one 4-carbon + one 1-carbon	one 1-carbon + one 4-carbon
6	one 4-carbon + one 2-carbon	one 2-carbon + one 4-carbon
7	one 4-carbon + one 3-carbon	one 3-carbon + one 4-carbon
8	two 4-carbon	two 4-carbon
9	two 4-carbon + one 1-carbon	one 1-carbon + two 4-carbon
10	two 4-carbon + one 2-carbon	one 2-carbon + two 4-carbon
11, etc.	two 4-carbon + one 3-carbon, etc.	one 3-carbon + two 4-carbon, etc.

Examples:

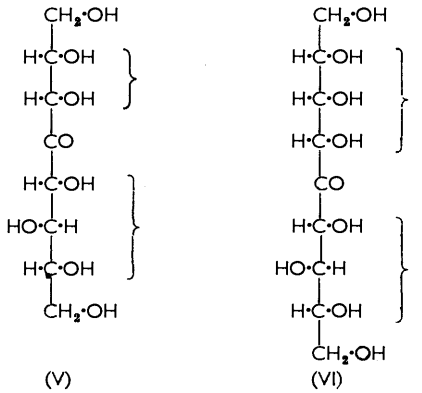


(I) (II) (III) (IV)

(I) D-*glycero*-D-*gluco*-heptose
(II) methyl 2-deoxy-L-*glycero*-α-L-*gulo*-octopyranoside
(III) methyl L-*erythro*-β-D-*galacto*-octopyranoside
(IV) D-*erythro*-L-*gluco*-nonulose

For other ketoses, the sequence of asymmetric carbon atoms will be similarly divided into units that commence with the group of three (or, if present, four) highest-numbered asymmetric carbon atoms that are next to the functional group.

Examples:

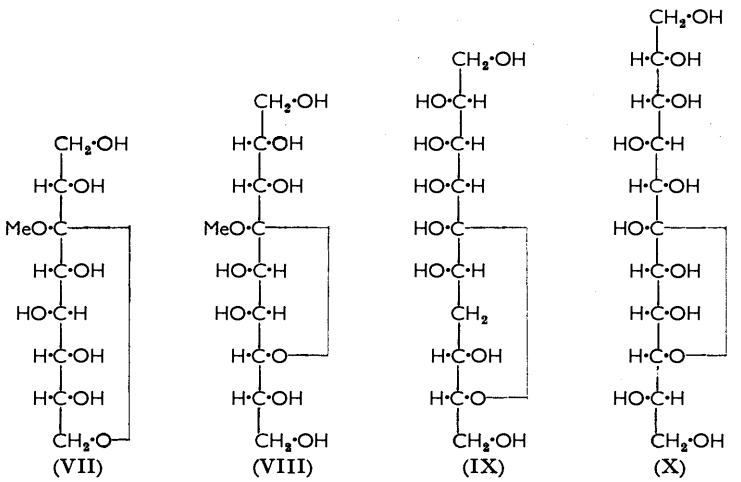


(V) (VI)

(V) D-*xylo*-D-*erythro*-4-octulose
(VI) D-*xylo*-D-*ribo*-5-nonulose or L-*ribo*-L-*xylo*-5-nonulose

For oxygen-ring forms of ketoses other than 2-ketoses, the ending (furanose, furanoside, etc.) will, when necessary, be immediately preceded by a pair of numerals identifying the two carbon atoms to which the oxygen ring is attached, the potential ketone group being cited first. When the potential ketone group of an oxygen-ring form is in the middle of the chain, the anomeric carbon atom has, as usual, the top vertical orientation, and numbering proceeds downward and toward the ring-forming hydroxyl group.

Examples:



(VII) (VIII) (IX) (X)

(VII) methyl β-D-*gluco*-D-*glycero*-3-octuloseptanoside
(VIII) methyl β-D-*manno*-D-*erythro*-4-nonulo-4,7-furanoside
(IX) 7-deoxy-β-D-*arabino*-L-*ribo*-5-deculo-5,9-pyranose
(X) α-L-*talo*-D-*gulo*-6-undeculo-6,9-furanose

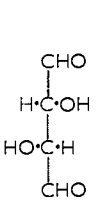
Comment. If the carbonyl group is, with reference to the asymmetric carbon atoms, in the middle of the chain, the sugars resemble the alditols (Rule 23) and dialdoses (Rule 24), in that some are *meso*-forms, for which the names are written without D or L, and some have two equally correct names [see example (VI)].

Rule 23 [Since the list of permissible names of alditols, established by usage, has now been omitted, the names of these compounds should be properly derived; also arabinitol should not be abbreviated to arabitol.]

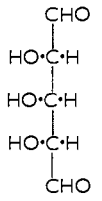
Rule 24 [This rule, previously under consideration, has now been published.] Dialdehydes formed from aldoses having a terminal $CH_2{\cdot}OH$ group by oxidation of this group only to CHO may be named by attaching the suffix " dialdose " to a root indicating the number of carbon atoms in the chain and then adding prefixes indicating the configurations of the asymmetric carbon atoms.

Examples:

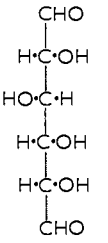
(*a*)



L-*threo*-tetrodialdose



ribo-pentodialdose



D-*gluco*-hexodialdose

(*b*) Names requiring D or L:

threo-tetrodialdose, *arabino*-pentodialdose, *gluco*-hexodialdose, *ido*-hexodialdose, *manno*-hexodialdose, *talo*-hexodialdose.

(*c*) Names of *meso*-forms are used without D or L. The prefix *meso*- may be inserted for clarity:

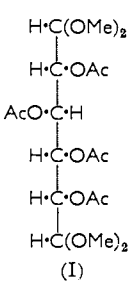
erythro-tetrodialdose, *ribo*-pentodialdose, *xylo*-pentodialdose, *allo*-hexodialdose, *meso-galacto*-hexodialdose.

The names of *meso*-forms can be used advantageously with D or L in naming derivatives which have become optically active by substitution.

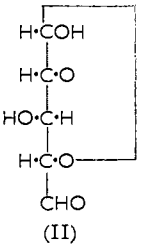
(*d*) Equivalent names:

D-*arabino*-pentodialdose and D-*lyxo*-pentodialdose; D-*gluco*-hexodialdose and L-*gulo*-hexodialdose; D-*talo*-hexodialdose and D-*altro*-hexodialdose.

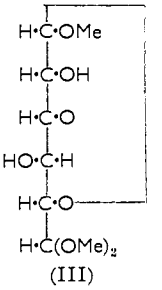
(*e*)



(I)



(II)

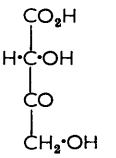


(III)

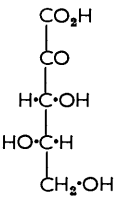
(I) tetra-*O*-acetyl-D-*gluco*-hexodialdose bis(dimethyl acetal)
(II) α-D-*xylo*-pentodialdo-1,4-furanose
(III) methyl α-D-*gulo*-hexodialdo-1,5-pyranoside 6-(dimethyl acetal)

New Rule 26 [This is a completely new rule.] When a secondary alcoholic hydroxyl group of an aldonic acid is oxidized to a carbonyl group, the compound will be named by means of the suffix " ulosonic acid " attached to a root designating the number of carbon atoms in the chain, which is in turn preceded by the appropriate numeral indicating the position of the ketonic function when other than **2** (see Rule 7). The configuration of the acid will be designated as given in Rule 6.

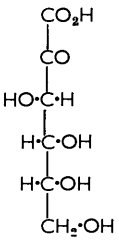
Examples:



D-*glycero*-3-tetrulosonic acid



L-*threo*-pentulosonic acid



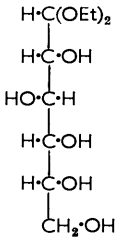
D-*arabino*-hexulosonic acid

α-D-*arabino*-hexulopyranosonic acid (common name: 2-keto-D-gluconic acid)
β-D-*arabino*-hexulopyranosono-1,4-lactone
methyl α-D-*arabino*-hexulopyranosidonic acid
methyl β-D-*arabino*-hexulofuranosidonamide
ethyl (methyl α-D-*arabino*-hexulopyranosid)onate
sodium (ethyl α-D-*arabino*-hexulofuranosid)onate

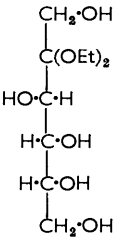
[Old Rules 26—30 have been renumbered 27—31.]

Rule 32 [This rule, originally under discussion, is now promulgated.] In naming acetals formed between alcohols (or thiols) and the carbonyl carbon atom of the acyclic forms of aldoses or ketoses, the name of the sugar will be the first word, " acetal " (" dithioacetal ") the last word, and the name of the appropriate radical (or radicals) will be the middle word (or words). Derivatives containing the hemiacetal function are named in an analogous manner.

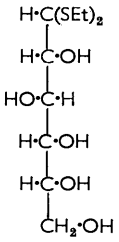
Examples:



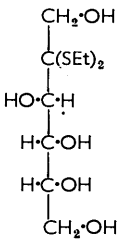
D-glucose diethyl acetal



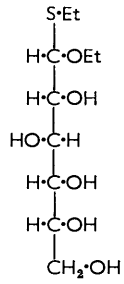
D-fructose diethyl acetal



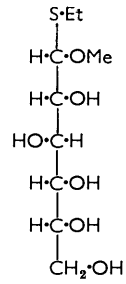
D-glucose diethyl dithioacetal



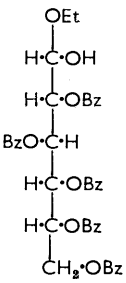
D-fructose diethyl dithioacetal



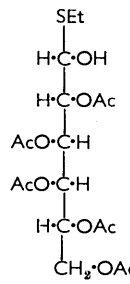
D-glucose diethyl monothioacetal



D-glucose *S*-ethyl *O*-methyl monothioacetal



2,3,4,5,6-penta-*O*-benzoyl-D-glucose ethyl hemiacetal



2,3,4,5,6-penta-*O*-acetyl-D-galactose S-ethyl monothiohemiacetal

Rule 33 [The name " sedoheptulosan " (for 2,7-anhydro-β-D-*altro*-heptulopyranose) is added as a trivial name established by usage.]

Rule 34 [As a result of revision of the wording of this Rule (to accord with the principle of Rule 15), the anomeric prefix now accompanies the name of the sugar residue instead of the appropriate numeral; anhydrides are therefore named as in the following examples.]

di-β-D-fructofuranose 1,2′:2,3′-dianhydride
β-D-fructofuranose β-D-*threo*-pentulofuranose 1,2′:2,1′-dianhydride
di-D-ribofuranose 1,5′:1′,5-dianhydride

Rule 35. Reducing disaccharides may also now be named according to the system described for tri- and higher oligo-saccharides.

Examples:

α-lactose: 4-*O*-β-D-galactopyranosyl-α-D-glucopyranose or *O*-β-D-galactopyranosyl-(1 ⟶ 4)-α-D-glucopyranose
methyl α-lactoside: methyl 4-*O*-β-D-galactopyranosyl-α-D-glucopyranoside or methyl *O*-β-D-galactopyranosyl-(1 ⟶ 4)-α-D-glucopyranoside
2-amino-2-deoxy-4-*O*-(β-D-galactopyranosyl)-α-D-glucopyranose or *O*-β-D-galactopyranosyl-(1 ⟶ 4)-2-amino-2-deoxy-α-D-glucopyranose
3-*O*-(4-*O*-methyl-α-D-galactopyranosyluronic acid)-α-D-glucopyranose or *O*-(4-*O*-methyl-α-D-galactopyranosyluronic acid)-(1 ⟶ 3)-α-D-glucopyranose
3-*O*-(2-amino-2-deoxy-β-D-glucopyranosyl)-α-D-glucopyranuronic acid or *O*-(2-amino-2-deoxy-β-D-glucopyranosyl)-(1 ⟶ 3)-α-D-glucopyranuronic acid
6-*O*-(methyl tri-*O*-acetyl-β-D-mannopyranosyluronate)-tri-*O*-acetyl-α-D-altropyranosyl bromide or *O*-(methyl tri-*O*-acetyl-β-D-mannopyranosyluronate)-(1 ⟶ 6)tri-*O*-acetyl-α-D-altropyranosyl bromide
4-*O*-(methyl 4-*O*-methyl-α-D-glucopyranosyluronate)-α-D-xylopyranose or *O*-(methyl 4-*O*-methyl-α-D-glucopyranosyluronate)-(1 ⟶ 4)-α-D-xylopyranose
phenyl 2-amino-2-deoxy-3-*O*-(ethyl β-D-glucopyranosyluronate)-β-D-galactopyranoside or phenyl *O*-(ethyl β-D-glucopyranosyluronate)-(1 ⟶ 3)-2-amino-2-deoxy-β-D-galactopyranoside

[Slight modification to the written form of non-reducing oligosaccharides is illustrated by the following.]

raffinose: *O*-α-D-galactopyranosyl-(1 ⟶ 6)-α-D-glucopyranosyl β-D-fructofuranoside
gentianose: *O*-β-D-glucopyranosyl-(1 ⟶ 6)-α-D-glucopyranosyl β-D-fructofuranoside

[Whilst the naming of polyuronic acids is shown by]

O-(α-D-galactopyranosyluronic acid)-(1 ⟶ 4)-*O*-(α-D-galactopyranosyluronic acid)-(1 ⟶ 4)-α-D-galactopyranuronic acid

2. Vitamins

Errors of transcription occur in the table of fat-soluble vitamins given on p. 200 of the " Handbook ". The vitamin A group should read:

Customary designation hitherto	Name adopted
Vitamin A_1 or axerophthol	Retinol
Retinene	Retinal
Vitamin A acid	Retinoic acid
Vitamin A_2	3-Dehydroretinol *or* dehydroretinol
Retinene 2	3-Dehydroretinal *or* dehydroretinal