

**ECLA****EUROPEAN CLASSIFICATION****C07H**

**SUGARS; DERIVATIVES THEREOF** (derivatives of aldonic or saccharic acids C07C, C07D; aldonic acids, saccharic acids C07C59/105, C07C59/285; cyanohydrins C07C121/36; glycals C07D; compounds of unknown constitution C07G; polysaccharides, derivatives thereof C08B; sugar and starch industry C13)

**Notes**

1. This subclass covers compounds containing saccharide radicals. (see the definitions in Note 3. below).
2. This subclass does not cover polysaccharides which for the purpose of this subclass are defined as having more than five saccharide radicals attached to each other by glycosidic linkages.
3. In this subclass, the following expressions are used with the meaning indicated:

- "saccharide radical" which is derived from acyclic polyhydroxy-aldehydes or acyclic polyhydroxy-ketones, or from their cyclic tautomers, by removing hydrogen atoms or by replacing hetero bonds to oxygen by the same number of hetero bonds to halogen, nitrogen, sulfur, selenium, or tellurium, in accordance with either of the following definitions:

- a. It consists of an uninterrupted carbon skeleton and oxygen atoms directly attached thereto, and;
- b. is considered to be terminated by every bond to a carbon atom of a cyclic structure and by every bond to a carbon atom having three bonds to hetero atoms, e.g. ester or nitrile radicals, and;
- c. contains within the carbon skeleton an unbranched sequence of at the most six carbon atoms in which at least three carbon atoms at least two in the case of a skeleton having only four carbon atoms have one single bond to an oxygen atom as the only hetero bond [N: but at least three for compounds in which at least one carbon to oxygen bond involved in a) or b) has been replaced by a carbon bond to a hetero atom other than oxygen], and
  - i. in a cyclic or acyclic sequence, at least one other carbon atom [N: that is not doubly bound to a carbon atom, e.g. glycals] has two single bonds to oxygen atoms as the only hetero bonds, or
  - ii. in an acyclic sequence, at least one other carbon atom [N: that is not doubly bound to a carbon atom] has one double bond to an oxygen atom as the only hetero bond;
- d. [N: has in the gamma or delta position in respect to the carbon atom bearing those two single bonds or this double bond to oxygen a carbon atom bearing one single bond to oxygen]
- e.

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[N: **Notes**

1. Attention is drawn to the notes following the title of class C07.
2. The conditions 3) a) or 4) have not to be fulfilled in respect to [C07H19/00E1](#)
3. Where a compound may exist --- to be written in Kekulé form
4. For the purpose of this subclass, the following definitions apply:
  - a. A "hetero ring" is a ring having at least one halogen, nitrogen, oxygen, sulfur, selenium or tellurium atom as a ring member;
  - b. Two rings are "condensed" if they share at least one ring member, i.e. "spiro" and "bridged" are considered as condensed. The term "bridged" denotes the presence of at least one fusion other than ortho, peri and spiro;
  - c. A "condensed ring system" is a ring system in which all rings are condensed among themselves;
  - d. The "number of relevant rings" in a condensed ring system equals the number of scissions necessary to convert the ring system into one acyclic chain;
  - e. The "relevant rings" in a condensed system are chosen according to the following criteria consecutively:
    - i. Lowest number of ring members
    - ii. Highest number of hetero atoms as ring members
    - iii. Lowest number of members shared with other rings
    - iv. Last place in the classification scheme
5. In the absence of specific places, hydrogenated or condensed hetero rings are classified with the parent ring
6. In the absence of an indication to the contrary, a compound is classified in the last appropriate place
7. Groups [C07H3/04](#) and [C07H3/06](#) take precedence over [C07H3/08](#) to [C07H15/18D](#) -with the exception of [C07H13/06](#), [C07H13/12U](#), [C07H15/00F](#), [C07H15/06](#), [C07H15/08](#), [C07H15/10D2](#), [C07H15/16](#)- and over [C07H15/20](#) as far as a phenyl radical is involved; the purpose of this inversion of the last place rule is to avoid multiple classification for documents describing compounds, having a complement inhibiting activity or belonging to the "blood-group substances" occurring in tissue fluids, in secretions and at cell and tissue surfaces (e.g. antigen determinants) or forming part of cell membranes. Documents in which both disaccharides and oligosaccharides of this kind are described are only classified in [C07H3/06](#).
8. Group [C07H9/00](#) takes precedence over [C07H11/00](#) to [C07H15/00](#) when at least

one ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides [C07H19/00](#).

9. Group [C07H15/252](#) takes precedence over [C07H17/00](#) when the naphthalene ring is further condensed to a heteroring, and over [C07H15/26](#) when the carbocyclic ring is substituted by a hetero ring]

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## **C07H1/00**

### **Processes for the preparation of sugar derivatives**

[C07H1/02](#)

- . Phosphorylation

[C07H1/04](#)

- . . Introducing polyphosphoric acid radicals

[C07H1/06](#)

- . Separation; Purification

[C07H1/08](#)

- . . from natural products

## **C07H3/00**

**Compounds containing only hydrogen atoms and saccharide radicals having only carbon, hydrogen and oxygen atoms** (preparation by hydrolysis of di- or polysaccharides [C13](#) and subgroups; separation and purification of sucrose, glucose, fructose, lactose or maltose [C13](#))

[C07H3/02](#)

- . Monosaccharides

[C07H3/04](#)

- . Disaccharides [[C9809](#)]

[N: **Note**

[[N9809](#)]Attention is drawn to Note 7 after the subclass title

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[C07H3/06](#)

- . Oligosaccharides, i.e. having three to five saccharide radicals attached to each other by glycosidic linkages [[C9809](#)]

[N: **Note**

[[N9809](#)]Attention is drawn to Note 7 after the subclass title

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[C07H3/08](#)

- . Deoxysugars; Unsaturated sugars (1,2-dideoxy-1-enoses [C07D](#)); Osones [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [[C9809](#)]

[C07H3/10](#)

- . Anhydrosugars, e.g. epoxides [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [[C9809](#)]

## **C07H5/00**

**Compounds containing saccharide radicals in which hetero bonds to oxygen have been replaced by the same number of hetero bonds to halogen, nitrogen, sulfur, selenium or tellurium** [N: when the hetero-atom is substituted [C07H11/00](#), [C07H13/00](#), [C07H15/00](#), [C07H17/00](#); when the hetero-atom(s) form(s) part of a heteroring [C07H9/00](#), [C07H19/00](#), [C07H21/00](#); ([C07H3/04](#), [C07H3/06](#), [C07H3/06H](#) take precedence)] [[C9809](#)]

[C07H5/02](#)

- . to halogen

- C07H5/04 . to nitrogen
- C07H5/06 . . Aminosugars [N: NH-acyl [C07H11/00](#), [C07H13/00](#); NHR or NR2 [C07H15/00](#), N-hetero atom [C07H16/00](#)]
- C07H5/08 . to sulfur, selenium or tellurium
- C07H5/10 . . to sulfur
- C07H7/00** **Compounds containing non-saccharide radicals linked to saccharide radicals by a carbon-to-carbon bond [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]**
- C07H7/02 . Acyclic radicals, e.g. glycuronic acids [N: gamma-lactones of 2- or 3-ketohexanoic or -pentanoic acids and derivatives thereof, (e.g. enol forms [C07D307/62](#)), e.g. ascorbic acid (1); D-galacturono-gamma-lactone (2); D-glucono-gamma-lactone (3); saccharosonic acid (4); D-gulono-gammalactone (5)
- Images  
] [C9809]
- C07H7/027 . . Keto-aldonic acids [N: keto-aldonic acids, e.g. 2-keto-gluconic acid (1); D-arabino-2-hexulsonic acid (2); 2-keto-gluco-pyranosic acid (3); xylo-2-furanosic acid (4)
- Images  
]
- C07H7/033 . . Uronic acids [N: uronic acids, e.g. galacturonic acid (1); galactofuranonic acid (2)
- Images  
]
- C07H7/04 . Carbocyclic radicals
- C07H7/06 . Heterocyclic radicals
- C07H9/00** **Compounds containing a hetero ring sharing at least two hetero atoms with a saccharide radical**
- [N: **Note**
1. The cyclic hetero-ring atom of the saccharide radical is not to be taken into consideration: levoglucosan [C07H19/01E](#)
  2. Attention is drawn to Note 8 after the subclass title
- ]
- C07H9/02 . the hetero ring containing only oxygen as ring hetero atoms
- C07H9/04 . . Cyclic acetals
- C07H9/06 . the hetero ring containing nitrogen as ring hetero atoms
- C07H11/00** **Compounds containing saccharide radicals esterified by inorganic acids; Metal salts thereof (halo-sugars [C07H5/02](#); thio-, seleno- or telluro-sugars [C07H5/08](#); [N: acetals [C07H9/04D](#)]; esterified by carbonic acid or derivatives thereof [C07H13/12](#); [N: [C07H3/04](#), [C07H3/06](#) take precedence; [C07H9/00](#) takes precedence when at least one**

ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides [C07H19/00](#)) [C9809]

C07H11/02 . Nitrates; Nitrites

C07H11/04 . Phosphates; Phosphites; Polyphosphates ([phosphonates C07H13/00](#))

**C07H13/00** **Compounds containing saccharide radicals esterified by carbonic acid or derivatives thereof, or by organic acids, e.g. phosphonic acids** [N: [acetals C07H9/04D](#); ([C07H3/04](#), [C07H3/06](#), [C07H13/12U](#) take precedence; [C07H9/00](#) takes precedence when at least one ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides [C07H19/00](#))] [C9809]

C07H13/02 . by carboxylic acids [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]

C07H13/04 . . having the esterifying carboxyl radicals attached to acyclic carbon atoms [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]

C07H13/06 . . . Fatty acids

C07H13/08 . . having the esterifying carboxyl radicals directly attached to carbocyclic rings [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]

C07H13/10 . . having the esterifying carboxyl radicals directly attached to heterocyclic rings [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]

C07H13/12 . by acids having the group -X-C(=X)-X-, or halides thereof, in which each X means nitrogen, oxygen, sulfur, selenium or tellurium, e.g. carbonic acid, carbamic acid [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]

**C07H15/00** **Compounds containing hydrocarbon or substituted hydrocarbon radicals directly attached to hetero atoms of saccharide radicals** [N: [acylated on hetero atoms of the saccharide radical C07H13/00](#); [derivatives of bis methylen dioxy carbohydrates C07H9/04D](#); ([C07H3/04](#), [C07H3/06](#), [C07H13/12U](#) take precedence; [C07H9/00](#) takes precedence when at least one ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides [C07H19/00](#))] [C9809]

#### **Note**

In this group, acyl radicals directly attached to hetero atoms of the saccharide radicals are not considered as substituted hydrocarbon radicals.

C07H15/02 . Acyclic radicals, not substituted by cyclic structures [N: ([C07H3/04](#), [C07H3/06](#), [C07H15/00F](#) take precedence)] [C9809]

C07H15/04 . . attached to an oxygen atom of the saccharide radical [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]

C07H15/06 . . . being a hydroxyalkyl group esterified by a fatty acid, [N: i.e.

Image  
]

C07H15/08 . . . Polyoxyalkylene derivatives ([polyoxyalkylene derivatives of polyols in general C07C41/00](#), [C07C43/00](#))

C07H15/10 . . . containing unsaturated carbon-to-carbon bonds [N: ([C07H3/04](#), [C07H3/06](#) take precedence)] [C9809]

C07H15/12 . . attached to a nitrogen atom of the saccharide radical [N: ([C07H3/04](#), [C07H3/06](#),

- [C07H15/10D2 take precedence](#))] [C9809]
- C07H15/14 . . attached to a sulfur, selenium or tellurium atom of a saccharide radical [N: [\(C07H3/04, C07H3/06, C07H15/10D2 take precedence\)](#)] [C9809]
- C07H15/16 . . . Lincomycin; Derivatives thereof [N: 6-deoxy-6-(possibly substituted) amino derivatives, e.g. lincosamines, celestosamines, clindamycins]
- C07H15/18 . Acyclic radicals, substituted by carbocyclic rings [N: chalcones and hydrogenated chalcones derived from saccharides substituted by 1-benzopyran-4-one radicals are to be classified in [C07H17/07](#); [\(C07H3/04, C07H3/06, C07H15/00F, C07H15/10D2 take precedence\)](#)] [C9809]
- C07H15/20 . Carbocyclic rings [N: [\(C07H15/00F, C07H15/10D2 take precedence\)](#)] [C9809]
- C07H15/203 . . Monocyclic carbocyclic rings other than cyclohexane [N: or cyclohexene or cyclohexadiene] rings; cyclohexene, cyclohexadiene; Bicyclic carbocyclic ring systems
- C07H15/207 . . Cyclohexane rings [N: and cyclohexene and cyclohexadiene rings] not substituted by nitrogen atoms, e.g. kasugamycins
- C07H15/22 . . Cyclohexane rings, substituted by nitrogen atoms
- [N: **Note**
- for this two dot subdivision:  
Image  
- for the three dot subdivisions: ([C07H15/22B](#) and [C07H15/222](#))  
]
- C07H15/222 . . . Cyclohexane rings substituted by at least two nitrogen atoms [N: at least two guanidine radicals [C07H15/238](#)]
- C07H15/224 . . . . with only one saccharide radical directly attached to the cyclohexyl radical, e.g. destomycin, fortimicin, neamine
- C07H15/226 . . . . [N: with at least two saccharide radicals directly attached to the cyclohexane rings]
- C07H15/228 . . . . . [N: attached to adjacent ring-carbon atoms of the cyclohexane rings]
- C07H15/23 . . . . . with only two saccharide radicals in the molecule, e.g.ambutyrin; butyrin; xylostatin; ribostamycin; [N: Antibiotics SF-733, Bu-1975, BB-K-137, BB-K-186]
- C07H15/232 . . . . . with at least three saccharide radicals in the molecule, e.g. lividomycin; neomycin; paromomycin [N: zygomycin; hybrimycin; quintomycin, fradiomycin; framycetin]
- C07H15/234 . . . . . attached to non-adjacent ring-carbon atoms of the cyclohexane rings, e.g. kanamycins, tobramycins, nebramycin, gentamycin A2 [N: see [C07H15/236K](#)]
- C07H15/236 . . . . . a saccharide radical being substituted by an alkylamino radical in position 3 and by two substituents different from hydrogen in position 4, e.g. gentamycin complex; sisomycin; verdamycin; [N: mutamycin; Antibiotics XK 62-2, 66-40, G-418, G-52]
- C07H15/238 . . . Cyclohexane rings substituted by two guanidine radicals, e.g. streptomycins
- C07H15/24 . . Condensed ring systems having three or more rings ([steroid glucosides C07J](#))
- C07H15/244 . . . Anthraquinone radicals, e.g. sennosides
- C07H15/248 . . . Colchicine radicals, e.g. colchicosides
- C07H15/252 . . . Naphtacene radicals [C9809]

[N: **Note**

[N9809]Attention is drawn to Note 9 after the subclass title  
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- C07H15/256 . . . Polyterpene radicals, [N: e.g. aescins; saponins; glycyrrhetic acid derivatives]
- C07H15/26 . Acyclic or carbocyclic radicals, substituted by hetero rings, [N: e.g. bleomycins, phleomycins, victomycins, zarbamycins ([C07H15/00F](#) and [C07H15/10D2](#) take precedence; [C07H15/252](#) takes precedence when the naphthalene ring is further condensed to a heteroring)] [N9809]
- C07H17/00** **Compounds containing heterocyclic radicals directly attached to hetero atoms of saccharide radicals** [N: ([C07H15/10D2](#), [C07H15/22](#), [C07H15/238](#) take precedence; [C07H15/252](#) takes precedence when the naphthalene ring is further condensed to a heteroring)] [C9809]
- C07H17/02 . Heterocyclic radicals containing only nitrogen as ring hetero atoms
- C07H17/04 . Heterocyclic radicals containing only oxygen as ring hetero atoms
- C07H17/06 . . [N: not condensed] Benzopyran radicals
- C07H17/065 . . . Benzo(b)pyran, [N: e.g. anthocyanins]
- C07H17/07 . . . . Benzo(b)pyran-4-ones, [N: e.g. quercetins, hesperidins, rutins, and the chalcones and hydrogenated chalcones derived from them]
- C07H17/075 . . . . Benzo(b)pyran-2-ones, [N: e.g. coumermycins, novobiocins, novenamides]
- C07H17/08 . . Hetero rings containing eight or more ring members, e.g. erythromycins
- C07H19/00** **Compounds containing a hetero ring sharing [N: only] one ring hetero atom with the saccharide radical** [N: the ring-heteroatom of the saccharide radical is not to be taken into consideration]; **Nucleosides; Mononucleotides** [N: or mononucleosides]; **Anhydro-derivatives thereof** [N: ([C07H15/10D2](#) takes precedence; acetals [C07H9/04D](#); intermediate for methods of chemical engineering [C07H21/00C4](#); nucleosides, nucleotides bonded to or "associated" with macromolecular compounds [C07H21/00E](#); nucleosides, nucleotides bonded to or "associated" with organic residues which make them suitable to be qualitatively or quantitatively retrieved [C07H21/00G](#))]
- C07H19/01 . Sharing oxygen [N: sharing no nitrogen atom with the saccharide radical, e.g. glucuronic acid lactone, rubrolone, levoglucosan  
  
Images  
]
- C07H19/02 . sharing nitrogen
- C07H19/04 . . Heterocyclic radicals containing only nitrogen atoms as ring hetero atoms [N: ([C07H19/02B](#), [C07H19/02D](#) take precedence)]
- C07H19/044 . . . Pyrrole radicals [N: Pyrrolo-pyrimidines [C07H19/14](#)]
- C07H19/048 . . . Pyridine radicals [N: Pyridino-pyrimidine [C07H19/06F](#), [C07H19/10F](#)]
- C07H19/052 . . . Imidazole radicals [N: Purines [C07H19/16](#)]
- C07H19/056 . . . Triazole or tetrazole radicals; ([Triazolo-pyrimidines](#) [C07H19/06F](#), [C07H19/10F](#))
- C07H19/06 . . . Pyrimidine radicals [N: purine [C07H19/16](#); pyrimidino-triazines [C07H19/12](#); pteridines [C07H19/22](#); pyrrolo-pyrimidines [C07H19/24](#)]
- C07H19/067 . . . . with ribosyl as the saccharide radical [N: not used]

- C07H19/073 . . . . with 2-deoxyribosyl as the saccharide radical [N: not used]
- C07H19/09 . . . . with arabinosyl as the saccharide radical [N: not used]
- C07H19/10 . . . . with the saccharide radical esterified by phosphoric or polyphosphoric acids [N: or other phosphorus containing acids]
- C07H19/11 . . . . . containing cyclic phosphate [N: not to be used]
- C07H19/12 . . . . Triazine radicals
- C07H19/14 . . . . Pyrrolo-pyrimidine radicals
- C07H19/16 . . . . Purine radicals
- C07H19/167 . . . . with ribosyl as the saccharide radical [N: not used]
- C07H19/173 . . . . with 2-deoxyribosyl as the saccharide radical [N: not used]
- C07H19/19 . . . . with arabinosyl as the saccharide radical [N: not used]
- C07H19/20 . . . . with the saccharide radical esterified by phosphoric or polyphosphoric acids [N: or other phosphorus containing acids]
- C07H19/207 . . . . . the phosphoric or polyphosphoric acids being esterified by a further hydroxylic compound, e.g. flavine adenine dinucleotide or nicotinamide-adenine dinucleotide (nicotinamide-adenine dinucleotide phosphate C07H21/02)
- C07H19/213 . . . . . containing cyclic phosphate [N: not to be used]
- C07H19/22 . . . . Pteridine radicals
- C07H19/23 . . . . Heterocyclic radicals containing two or more heterocyclic rings condensed among themselves or condensed with a common carbocyclic ring system, not provided for in groups C07H19/14 to C07H19/22 [N: not to be used]
- C07H19/24 . . Heterocyclic radicals containing oxygen or sulfur as ring hetero atoms [N: (C07H19/02B, C07H19/02D take precedence)]
  
- C07H21/00** **Compounds containing two or more mononucleotide units, [N: having separate phosphate or polyphosphate groups linked by saccharide radicals of nucleoside groups (C07H15/10D2 takes precedence)] e.g. nucleic acids**
- C07H21/02 . with ribosyl as saccharide radical [N: (C07H21/00C4 takes precedence)]
- C07H21/04 . with deoxyribosyl as saccharide radical [N: (C07H21/00C takes precedence)]
  
- C07H23/00** **Compounds containing boron, silicon or a metal, e.g. chelates, vitamin B12 (esters with inorganic acids, C07H11/00; metal salts: see parent compounds) [N: (C07H15/10D2 takes precedence)]**
  
- C07H99/00** **Subject matter not provided for in other groups of this subclass [N0704]**