

CPC**COOPERATIVE PATENT CLASSIFICATION****C07H**

SUGARS; DERIVATIVES THEREOF (derivatives of aldonic or saccharic acids [C07C](#) , [C07D](#) ; aldonic acids, saccharic acids [C07C 59/105](#) , [C07C 59/285](#) ; cyanohydrins [C07C 255/16](#) ; glycals [C07D](#) ; compounds of unknown constitution [C07G](#) ; polysaccharides, derivatives thereof [C08B](#) ; sugar and starch industry [C13](#))

NOTE

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
 - i. consists of an uninterrupted carbon skeleton and oxygen atoms directly attached thereto, and;
 - ii. 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;
 - iii. 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only hetero bond {but at least three for compounds in which at least one carbon to oxygen bond involved in a) or b) has been replaced by a carbon bond to a hetero atom other than oxygen} , and
 - a. in a cyclic or acyclic sequence, at least one other carbon atom {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
 - b. in an acyclic sequence, at least one other carbon atom {that is not doubly bound to a carbon atom} has one double bond to an oxygen atom as the only hetero bond;
 - iv. {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}
 - b. {It is also a radical derived from a radical as defined in a. above by replacing at the most four of the specified hetero bonds to oxygen by the same number of hetero bonds to halogen, nitrogen, sulfur, selenium, or tellurium;}

C07H

(continued)

- "heterocyclic radical" or "hetero ring" is considered to exclude saccharide radicals as defined above
4. Attention is drawn to the notes following the title of class [C07](#).
 5. The conditions 3) a) or 4) have not to be fulfilled in respect to **C07H19/00E1**
 6. Where a compound may exist --- to be written in Kekulé form
 7. For the purpose of this subclass, the following definitions apply:
 - A "hetero ring" is a ring having at least one halogen, nitrogen, oxygen, sulfur selenium or tellurium atom as a ring member;
 - 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;
 - A "condensed ring system" is a ring system in which all rings are condensed among themselves;
 - 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;
 - The "relevant rings" in a condensed system are chosen according to the following criteria consecutively:
 - Lowest number of ring members
 - Highest number of hetero atoms as ring members
 - Lowest number of members shared with other rings
 - Last place in the classification scheme
 8. In the absence of specific places, hydrogenated or condensed hetero rings are classified with the parent ring
 9. In the absence of an indication to the contrary, a compound is classified in the last appropriate place
 10. Groups [C07H 3/04](#) and [C07H 3/06](#) take precedence over [C07H 3/08](#) to **C07H15/18D** -with the exception of [C07H 13/06](#), **C07H13/12U**, **C07H15/00F**, [C07H 15/06](#), [C07H 15/08](#), **C07H15/10D2**, [C07H 15/16](#) - and over [C07H 15/20](#) 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 [C07H 3/06](#).
 11. Group [C07H 9/00](#) takes precedence over [C07H 11/00](#) to [C07H 15/00](#) when at least one ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides [C07H 19/00](#).
 12. Group [C07H 15/252](#) takes precedence over [C07H 17/00](#) when the naphthalene ring is further condensed to a heteroring, and over [C07H 15/26](#) when the carbocyclic ring is substituted by a hetero ring]

C07H 1/00

C07H 1/02

Processes for the preparation of sugar derivatives

- . Phosphorylation

- C07H 1/04 . . . Introducing polyphosphoric acid radicals
- C07H 1/06 . Separation; Purification
- C07H 1/08 . . . from natural products

C07H 3/00 **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](#))

- C07H 3/02 . Monosaccharides
- C07H 3/04 . Disaccharides

NOTE

Attention is drawn to Note 7 after the subclass title

- C07H 3/06 . Oligosaccharides, i.e. having three to five saccharide radicals attached to each other by glycosidic linkages

NOTE

Attention is drawn to Note 7 after the subclass title

- C07H 3/08 . Deoxysugars; Unsaturated sugars (1,2-dideoxy-1-enoses [C07D](#)); Osones {([C07H 3/04](#) , [C07H 3/06](#) take precedence)}
- C07H 3/10 . Anhydrosugars, e.g. epoxides {([C07H 3/04](#) , [C07H 3/06](#) take precedence)}

C07H 5/00 **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** {(when the hetero-atom is substituted [C07H 11/00](#) , [C07H 13/00](#) , [C07H 15/00](#) , [C07H 17/00](#) ; when the hetero-atom(s) form(s) part of a heteroring [C07H 9/00](#) , [C07H 19/00](#) , [C07H 21/00](#) ; [C07H 3/04](#) , [C07H 3/06](#) , take precedence)}

- C07H 5/02 . to halogen
- C07H 5/04 . to nitrogen
- C07H 5/06 . . . Aminosugars {(NH-acyl [C07H 11/00](#) , [C07H 13/00](#) ; NHR or NR₂ [C07H 15/00](#))}
- C07H 5/08 . to sulfur, selenium or tellurium
- C07H 5/10 . . . to sulfur

C07H 7/00 **Compounds containing non-saccharide radicals linked to saccharide radicals by a carbon-to-carbon bond** {([C07H 3/04](#) , [C07H 3/06](#) take precedence)}

- C07H 7/02 . Acyclic radicals, e.g. glycuronic acids {gamma-lactones of 2- or 3-ketohexanoic or -pentanoic acids and derivatives thereof, (e.g. enol forms [C07D 307/62](#)) , e.g. ascorbic acid (1); D-galacturono-gamma-lactone (2); D-glucono-gamma-lactone (3); saccharosonic acid (4); D-gulono-gammalactone (5)
Images
}
- C07H 7/027 . . . Keto-aldonic acids{ 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
}

C07H 7/033 . . Uronic acids{ uronic acids, e.g. galacturonic acid (1); galactofuranonic acid (2)
 Images
 }

C07H 7/04 . Carbocyclic radicals

C07H 7/06 . Heterocyclic radicals

C07H 9/00 Compounds containing a hetero ring sharing at least two hetero atoms with a saccharide radical

C07H 9/02 . the hetero ring containing only oxygen as ring hetero atoms

C07H 9/04 . . Cyclic acetals

C07H 9/06 . the hetero ring containing nitrogen as ring hetero atoms

C07H 11/00 Compounds containing saccharide radicals esterified by inorganic acids; Metal salts thereof (halo-sugars C07H 5/02 ; thio-, seleno- or telluro-sugars C07H 5/08 ; { acetals C07H9/04D } ; esterified by carbonic acid or derivatives thereof C07H 13/12 ; {C07H 3/04 , C07H 3/06 take precedence; C07H 9/00 takes precedence when at least one ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides C07H 19/00})

C07H 11/02 . Nitrates; Nitrites

C07H 11/04 . Phosphates; Phosphites; Polyphosphates (phosphonates C07H 13/00)

C07H 13/00 Compounds containing saccharide radicals esterified by carbonic acid or derivatives thereof, or by organic acids, e.g. phosphonic acids {(acetals C07H9/04D ; C07H 3/04 , C07H 3/06 , C07H13/12U take precedence; C07H 9/00 takes precedence when at least one ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides C07H 19/00)}

C07H 13/02 . by carboxylic acids {(C07H 3/04 , C07H 3/06 take precedence)}

C07H 13/04 . . having the esterifying carboxyl radicals attached to acyclic carbon atoms
 {(C07H 3/04 , C07H 3/06 take precedence)}

C07H 13/06 . . . Fatty acids

C07H 13/08 . . having the esterifying carboxyl radicals directly attached to carbocyclic rings
 {(C07H 3/04 , C07H 3/06 take precedence)}

C07H 13/10 . . having the esterifying carboxyl radicals directly attached to heterocyclic rings
 {(C07H 3/04 , C07H 3/06 take precedence)}

C07H 13/12 . 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
 {(C07H 3/04 , C07H 3/06 take precedence)}

C07H 15/00 Compounds containing hydrocarbon or substituted hydrocarbon radicals directly attached to hetero atoms of saccharide radicals {(acylated on hetero atoms of the saccharide radical C07H 13/00 ; derivatives of bis methylen dioxy carbohydrates C07H9/04D ; C07H 3/04 , C07H 3/06 , take precedence; C07H 9/00 takes precedence when at least one ring heteroatom is different from oxygen, however anhydro derivatives of nucleosides and nucleotides C07H 19/00)}

NOTE

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

- C07H 15/02 . Acyclic radicals, not substituted by cyclic structures {(C07H 3/04 , C07H 3/06 , **C07H15/00F** take precedence)}
- C07H 15/04 . . attached to an oxygen atom of the saccharide radical {(C07H 3/04 , C07H 3/06 take precedence)}
- C07H 15/06 . . . being a hydroxyalkyl group esterified by a fatty acid,{ i.e.
Image }
- C07H 15/08 . . . Polyoxyalkylene derivatives (polyoxyalkylene derivatives of polyols in general C07C 41/00 , C07C 43/00)
- C07H 15/10 . . . containing unsaturated carbon-to-carbon bonds {(C07H 3/04 , C07H 3/06 take precedence)}
- C07H 15/12 . . attached to a nitrogen atom of the saccharide radical {(C07H 3/04 , C07H 3/06 , **C07H15/10D2** take precedence)}
- C07H 15/14 . . attached to a sulfur, selenium or tellurium atom of a saccharide radical {(C07H 3/04 , C07H 3/06 , **C07H15/10D2** take precedence)}
- C07H 15/16 . . . Lincomycin; Derivatives thereof {6-deoxy-6-(possibly substituted)amino derivatives, e.g. lincosamines, celestosamines, clindamycins}
- C07H 15/18 . Acyclic radicals, substituted by carbocyclic rings {(chalcones and hydrogenated chalcones derived from saccharides substituted by 1-benzopyran-4-one radicals are to be classified in C07H 17/07 ; C07H 3/04 , C07H 3/06 , **C07H15/00F** , **C07H15/10D2** take precedence)}
- C07H 15/20 . Carbocyclic rings {(**C07H15/00F** , **C07H15/10D2** take precedence)}
- C07H 15/203 . . Monocyclic carbocyclic rings other than cyclohexane {or cyclohexene or cyclohexadiene}rings; cyclohexene, cyclohexadiene; Bicylic carbocyclic ring systems
- C07H 15/207 . . Cyclohexane rings {and cyclohexene and cyclohexadiene rings}not substituted by nitrogen atoms, e.g. kasugamycins
- C07H 15/22 . . Cyclohexane rings, substituted by nitrogen atoms

NOTE

- for this two dot subdivision:

Image

- for the three dot subdivisions: (**C07H15/22B**
and C07H 15/222)

- C07H 15/222 . . . Cyclohexane rings substituted by at least two nitrogen atoms {(at least two guanidine radicals C07H 15/238)}
- C07H 15/224 . . . with only one saccharide radical directly attached to the cyclohexyl radical, e.g. destomycin, fortimicin, neamine
- C07H 15/226 . . . {with at least two saccharide radicals directly attached to the cyclohexane rings}
- C07H 15/228 . . . {attached to adjacent ring-carbon atoms of the cyclohexane rings}
- C07H 15/23 . . . with only two saccharide radicals in the molecule, e.g. ambutyrosin; butyrosin; xylostatin; ribostamycin;{Antibiotics SF-733, Bu-1975, BB-K-137, BB-K-186}

- C07H 15/232 with at least three saccharide radicals in the molecule, e.g. lividomycin; neomycin; paromomycin {zygomycin; hybrimycin; quintomycin, fradiomycin; framycetin}
- C07H 15/234 attached to non-adjacent ring-carbon atoms of the cyclohexane rings, e.g. kanamycins, tobramycins, nebramycin, gentamycin A2
- C07H 15/236 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; {mutamycin; Antibiotics XK 62-2, 66-40, G-418, G-52}
- C07H 15/238 Cyclohexane rings substituted by two guanidine radicals, e.g. streptomycins
- C07H 15/24 Condensed ring systems having three or more rings (steroid glucosides C07J)
- C07H 15/244 Anthraquinone radicals, e.g. sennosides
- C07H 15/248 Colchicine radicals, e.g. colchicosides
- C07H 15/252 Naphtacene radicals

NOTE

Attention is drawn to Note 9 after the subclass title

- C07H 15/256 Polyterpene radicals, {e.g. aescins; saponins; glycyrrhetic acid derivatives}
- C07H 15/26 Acyclic or carbocyclic radicals, substituted by hetero rings, {e.g. bleomycins, phleomycins, victomycins, zarbamycins (and C07H15/10D2 take precedence; C07H 15/252 takes precedence when the naphtacene ring is further condensed to a heteroring)}

C07H 17/00 **Compounds containing heterocyclic radicals directly attached to hetero atoms of saccharide radicals** {(C07H15/10D2 , C07H 15/22 , C07H 15/238 take precedence; C07H 15/252 takes precedence when the naphtacene ring is further condensed to a heteroring)}

- C07H 17/02 Heterocyclic radicals containing only nitrogen as ring hetero atoms
- C07H 17/04 Heterocyclic radicals containing only oxygen as ring hetero atoms
- C07H 17/06 {not condensed}Benzopyran radicals
- C07H 17/065 Benzo(b)pyran, {e.g. anthocyanins}
- C07H 17/07 Benzo(b)pyran-4-ones, {e.g. quercetins, hesperidins, rutins, and the chalcones and hydrogenated chalcones derived from them}
- C07H 17/075 Benzo(b)pyran-2-ones, {e.g. coumermycins, novobiocins, novenamides}
- C07H 17/08 Hetero rings containing eight or more ring members, e.g. erythromycins

C07H 19/00 **Compounds containing a hetero ring sharing {only}one ring hetero atom with the saccharide radical{the ring-heteroatom of the saccharide radical is not to be taken into consideration}; Nucleosides; Mononucleotides {or mononucleosides}; Anhydro-derivatives thereof** {(C07H15/10D2 takes precedence; intermediate for methods of chemical engineering C07H21/00C4)}

- C07H 19/01 Sharing oxygen{ sharing no nitrogen atom with the saccharide radical, e.g. glucuronic acid lactone, rubrolone, levoglucosan
Images
}
- C07H 19/02 sharing nitrogen

- C07H 19/04 .. Heterocyclic radicals containing only nitrogen atoms as ring hetero atoms
{(C07H19/02B , C07H19/02D take precedence)}
- C07H 19/044 ... Pyrrole radicals {(Pyrrolo-pyrimidines C07H 19/14)}
- C07H 19/048 ... Pyridine radicals {(Pyridino-pyrimidine C07H19/06F , C07H19/10F)}
- C07H 19/052 ... Imidazole radicals {(Purines C07H 19/16)}
- C07H 19/056 ... Triazole or tetrazole radicals;
- C07H 19/06 ... Pyrimidine radicals {(purine C07H 19/16 ; pyrimidino-triazines C07H 19/12 ;
pteridines C07H 19/22 ; pyrrolo-pyrimidines C07H 19/24)}
- C07H 19/067 with ribosyl as the saccharide radical {not used}
- C07H 19/073 with 2-deoxyribosyl as the saccharide radical {not used}
- C07H 19/09 with arabinosyl as the saccharide radical {not used}
- C07H 19/10 with the saccharide radical esterified by phosphoric or polyphosphoric acids
{or other phosphorus containing acids}
- C07H 19/11 containing cyclic phosphate {not to be used}
- C07H 19/12 ... Triazine radicals
- C07H 19/14 ... Pyrrolo-pyrimidine radicals
- C07H 19/16 ... Purine radicals
- C07H 19/167 with ribosyl as the saccharide radical {not used}
- C07H 19/173 with 2-deoxyribosyl as the saccharide radical {not used}
- C07H 19/19 with arabinosyl as the saccharide radical {not used}
- C07H 19/20 with the saccharide radical esterified by phosphoric or polyphosphoric acids
{or other phosphorus containing acids}
- C07H 19/207 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
C07H 21/02)
- C07H 19/213 containing cyclic phosphate {not to be used}
- C07H 19/22 ... Pteridine radicals
- C07H 19/23 ... Heterocyclic radicals containing two or more heterocyclic rings condensed
among themselves or condensed with a common carbocyclic ring system, not
provided for in groups C07H 19/14 to C07H 19/22{not to be used}
- C07H 19/24 .. Heterocyclic radicals containing oxygen or sulfur as ring hetero atoms
- C07H 21/00** **Compounds containing two or more mononucleotide units,{having separate
phosphate or polyphosphate groups linked by saccharide radicals of
nucleoside groups (C07H15/10D2 takes precedence)}e.g. nucleic acids**
- C07H 21/02 . with ribosyl as saccharide radical
- C07H 21/04 . with deoxyribosyl as saccharide radical
- C07H 23/00** **Compounds containing boron, silicon or a metal, e.g. chelates, vitamin B12
(esters with inorganic acids, C07H 11/00 ; metal salts: see parent compounds)**
- C07H 99/00** **Subject matter not provided for in other groups of this subclass**