

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

CHEMISTRY

C07 ORGANIC CHEMISTRY (such compounds as the oxides, sulfides, or oxysulfides of carbon, cyanogen, phosgene, hydrocyanic acid or salts thereof [C01](#); products obtained from layered base-exchange silicates by ion-exchange with organic compounds such as ammonium, phosphonium or sulfonium compounds or by intercalation of organic compounds [C01B 33/44](#); macromolecular compounds [C08](#); dyes [C09](#); fermentation products [C12](#); fermentation or enzyme-using processes to synthesise a desired chemical compound or composition or to separate optical isomers from a racemic mixture [C12P](#); production of organic compounds by electrolysis or electrophoresis [C25B 3/00](#), [C25B 7/00](#))

(NOTES omitted)

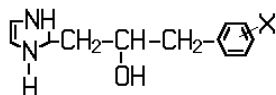
C07D HETEROCYCLIC COMPOUNDS

NOTES

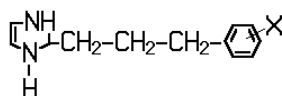
1. This subclass does not cover compounds containing saccharide radicals as defined in Note (3) following the title of subclass [C07H](#), which are covered by subclass [C07H](#).
2. In this subclass, in compounds containing a hetero ring covered by group [C07D 295/00](#) and at least one other hetero ring, the hetero ring covered by group [C07D 295/00](#) is considered as an acyclic chain containing nitrogen atoms.
3. In this subclass, the following terms or expressions are used with the meaning indicated:
 - "hetero ring" is a ring having at least one halogen, nitrogen, oxygen, sulfur, selenium or tellurium atom as a ring member;
 - "bridged" means the presence of at least one fusion other than ortho, peri or spiro;
 - two rings are "condensed" if they share at least one ring member, i.e. "spiro" and "bridged" are considered as condensed;
 - "condensed ring system" is a ring system in which all rings are condensed among themselves;
 - "number of relevant rings" in a condensed ring system equals the number of scissions necessary to convert the ring system into one acyclic chain;
 - "relevant rings" in a condensed ring system, i.e. the rings which taken together describe all the links between every atom of the ring system, are chosen according to the following criteria consecutively:
 - a. lowest number of ring members;
 - b. highest number of hetero atoms as ring members;
 - c. lowest number of members shared with other rings;
 - d. last place in the classification scheme.
4. Attention is drawn to Note (3) after class [C07](#), which defines the last place priority rule applied in the range of subclasses [C07C](#) - [C07K](#) and within these subclasses.
5. Therapeutic activity of compounds is further classified in subclass [A61P](#).
6. In this subclass, the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary:
 - a. compounds having only one hetero ring are classified in the last appropriate place in one of the groups [C07D 203/00](#) - [C07D 347/00](#). The same applies for compounds having more hetero rings covered by the same main group, neither condensed among themselves nor condensed with a common carbocyclic ring system;
 - b. compounds having two or more hetero rings covered by different main groups neither condensed among themselves nor condensed with a common carbocyclic ring system are classified in the last appropriate place in one of the groups [C07D 401/00](#) - [C07D 421/00](#);
 - c. compounds having two or more relevant hetero rings, covered by the same or by different main groups, which are condensed among themselves or condensed with a common carbocyclic ring system, are classified in the last appropriate place in one of the groups [C07D 451/00](#) - [C07D 519/00](#).
7. In this subclass:
 - where a compound may exist in tautomeric forms, it is classified as though existing in the form which is classified last in the system. Therefore, double bonds between ring members and non-ring members and double bonds between ring members themselves are considered equivalent in determining the degree of hydrogenation of the ring. Formulae are considered to be written in Kekule form;
 - hydrocarbon radicals containing a carbocyclic ring and an acyclic chain by which it is linked to the hetero ring and being substituted on both the carbocyclic ring and the acyclic chain by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, are classified according to the substituents on the acyclic chain. For example, the compound

C07D

(continued)



is classified in group [C07D 233/22](#),
and the compound



is classified in groups [C07D 233/24](#) and [C07D 233/26](#), where X —NH₂, —NHCOCH₃, or —COOCH₃.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Heterocyclic compounds having only nitrogen as ring hetero atom**201/00 Preparation, separation, purification or stabilisation of unsubstituted lactams**

- 201/02 . Preparation of lactams
- 201/04 . . from or via oximes by Beckmann rearrangement
- 201/06 . . . from ketones by simultaneous oxime formation and rearrangement
- 201/08 . . from carboxylic acids or derivatives thereof, e.g. hydroxycarboxylic acids, lactones, nitriles
- 201/10 . . from cycloaliphatic compounds by simultaneous nitrosylation and rearrangement
- 201/12 . . by depolymerising polyamides
- 201/14 . Preparation of salts or adducts of lactams
- 201/16 . Separation or purification ([separation of inorganic salts C01](#))
- 201/18 . Stabilisation

203/00 Heterocyclic compounds containing three-membered rings with one nitrogen atom as the only ring hetero atom

- 203/02 . Preparation by ring-closure
- 203/04 . not condensed with other rings
- 203/06 . . having no double bonds between ring members or between ring members and non-ring members
- 203/08 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring nitrogen atom
- 203/10 Radicals substituted by singly bound oxygen atoms
- 203/12 Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 203/14 with carbocyclic rings directly attached to the ring nitrogen atom
- 203/16 with acylated ring nitrogen atoms
- 203/18 by carboxylic acids, or by sulfur or nitrogen analogues thereof
- 203/20 by carbonic acid, or by sulfur or nitrogen analogues thereof, e.g. carbamates
- 203/22 . . . with hetero atoms directly attached to the ring nitrogen atom
- 203/24 Sulfur atoms
- 203/26 . condensed with carbocyclic rings or ring systems

205/00

205/02

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207/00

207/02

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207/09

207/10

207/12

207/14

Heterocyclic compounds containing four-membered rings with one nitrogen atom as the only ring hetero atom

- . not condensed with other rings
- . . having no double bonds between ring members or between ring members and non-ring members
- . . having one double bond between ring members or between a ring member and a non-ring member
- . . . with one oxygen atom directly attached in position 2, e.g. beta-lactams
- with a nitrogen atom directly attached in position 3
- with a sulfur atom directly attached in position 4
- and with a nitrogen atom directly attached in position 3
- . . having two double bonds between ring members or between ring members and non-ring members
- . condensed with carbocyclic rings or ring systems

Heterocyclic compounds containing five-membered rings not condensed with other rings, with one nitrogen atom as the only ring hetero atom**NOTE**

Pyrrolidines having only hydrogen atoms attached to the ring carbon atoms are classified in [C07D 295/00](#)

- . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- . . having no double bonds between ring members or between ring members and non-ring members
- . . . with radicals, containing only hydrogen and carbon atoms, attached to ring carbon atoms
- . . . with hydrocarbon radicals, substituted by hetero atoms, attached to ring carbon atoms
- Radicals substituted by nitrogen atoms, not forming part of a nitro radical
- . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- Oxygen or sulfur atoms
- Nitrogen atoms not forming part of a nitro radical

- 207/16 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 207/18 . . having one double bond between ring members or between a ring member and a non-ring member
- 207/20 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 207/22 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 207/24 Oxygen or sulfur atoms
- 207/26 2-Pyrrolidones
- 207/263 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms
- 207/267 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atom
- 207/27 with substituted hydrocarbon radicals directly attached to the ring nitrogen atom
- 207/273 with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to other ring carbon atoms
- 207/277 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 207/28 2-Pyrrolidone-5- carboxylic acids; Functional derivatives thereof, e.g. esters, nitriles
- 207/30 . . having two double bonds between ring members or between ring members and non-ring members
- 207/32 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 207/323 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to the ring nitrogen atoms
- 207/325 with substituted hydrocarbon radicals directly attached to the ring nitrogen atom
- 207/327 Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 207/33 with substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 207/333 Radicals substituted by oxygen or sulfur atoms
- 207/335 Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 207/337 Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 207/34 . . . with heteroatoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 207/36 Oxygen or sulfur atoms
- 207/38 2-Pyrrolones
- 207/40 2,5-Pyrrolidine-diones
- 207/404 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. succinimide
- 207/408 Radicals containing only hydrogen and carbon atoms attached to ring carbon atoms
- 207/412 Acyclic radicals containing more than six carbon atoms
- 207/416 with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to other ring carbon atoms
- 207/42 Nitro radicals
- 207/44 . . having three double bonds between ring members or between ring members and non-ring members
- 207/444 . . . having two doubly-bound oxygen atoms directly attached in positions 2 and 5
- 207/448 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms directly attached to other ring carbon atoms, e.g. maleimide
- 207/452 with hydrocarbon radicals, substituted by hetero atoms, directly attached to the ring nitrogen atom
- 207/456 with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to other ring carbon atoms
- 207/46 . . with hetero atoms directly attached to the ring nitrogen atom
- 207/48 . . Sulfur atoms
- 207/50 . . Nitrogen atoms
- 209/00 Heterocyclic compounds containing five-membered rings, condensed with other rings, with one nitrogen atom as the only ring hetero atom**
- 209/02 . . condensed with one carbocyclic ring
- 209/04 . . Indoles; Hydrogenated indoles
- 209/06 . . . Preparation of indole from coal-tar
- 209/08 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to carbon atoms of the hetero ring
- 209/10 . . . with substituted hydrocarbon radicals attached to carbon atoms of the hetero ring
- 209/12 Radicals substituted by oxygen atoms
- 209/14 Radicals substituted by nitrogen atoms, not forming part of a nitro radical
- 209/16 Tryptamines
- 209/18 Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 209/20 substituted additionally by nitrogen atoms, e.g. tryptophane
- 209/22 with an aralkyl radical attached to the ring nitrogen atom
- 209/24 with an alkyl or cycloalkyl radical attached to the ring nitrogen atom

- 209/26 with an acyl radical attached to the ring nitrogen atom
- 209/28 1-(4-Chlorobenzoyl)-2-methyl-indolyl-3-acetic acid, substituted in position 5 by an oxygen or nitrogen atom; Esters thereof
- 209/30 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to carbon atoms of the hetero ring
- 209/32 Oxygen atoms
- 209/34 in position 2
- 209/36 in position 3, e.g. adrenochrome
- 209/38 in positions 2 and 3, e.g. isatin
- 209/40 Nitrogen atoms, not forming part of a nitro radical, e.g. isatin semicarbazone
- 209/42 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 209/43 . . . with an —OCH₂CH(OH)CH₂NH₂ radical, which may be further substituted, attached in positions 4, 5, 6 or 7
- 209/44 . . Iso-indoles; Hydrogenated iso-indoles
- 209/46 . . . with an oxygen atom in position 1
- 209/48 . . . with oxygen atoms in positions 1 and 3, e.g. phthalimide
- 209/49 and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemumic acid esters
- 209/50 . . . with oxygen and nitrogen atoms in positions 1 and 3
- 209/52 . . condensed with a ring other than six-membered
- 209/54 . . Spiro-condensed
- 209/56 . Ring systems containing three or more rings
- 209/58 . . [b]- or [c]-condensed
- 209/60 . . . Naphtho [b] pyrroles; Hydrogenated naphtho [b] pyrroles
- 209/62 . . . Naphtho [c] pyrroles; Hydrogenated naphtho [c] pyrroles
- 209/64 with an oxygen atom in position 1
- 209/66 with oxygen atoms in positions 1 and 3
- 209/68 with oxygen and nitrogen atoms in positions 1 and 3
- 209/70 . . . containing carbocyclic rings other than six-membered
- 209/72 . . . 4,7-Endo-alkylene-iso-indoles
- 209/74 with an oxygen atom in position 1
- 209/76 with oxygen atoms in positions 1 and 3
- 209/78 with oxygen and nitrogen atoms in positions 1 and 3
- 209/80 . . [b, c]- or [b, d]-condensed
- 209/82 . . . Carbazoles; Hydrogenated carbazoles
- 209/84 Separation, e.g. from tar; Purification
- 209/86 with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system
- 209/88 with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the ring system
- 209/90 . . . Benzo [c, d] indoles; Hydrogenated benzo [c, d] indoles
- 209/92 Naphthostyrils
- 209/94 . . . containing carbocyclic rings other than six-membered
- 209/96 . . Spiro-condensed ring systems
- 211/00 Heterocyclic compounds containing hydrogenated pyridine rings, not condensed with other rings**
- NOTES**
1. For the purpose of this group, the term "hydrogenated" means having less than three double bonds between ring members or between ring members and non-ring members;
2. Piperidines having only hydrogen atoms attached to the ring carbon atoms are classified in [C07D 295/00](#)
- 211/02 . Preparation by ring-closure or hydrogenation
- 211/04 . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- 211/06 . . having no double bonds between ring members or between ring members and non-ring members
- 211/08 . . . with hydrocarbon or substituted hydrocarbon radicals directly attached to ring carbon atoms
- 211/10 with radicals containing only carbon and hydrogen atoms attached to ring carbon atoms
- 211/12 with only hydrogen atoms attached to the ring nitrogen atom
- 211/14 with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom
- 211/16 with acylated ring nitrogen atom
- 211/18 with substituted hydrocarbon radicals attached to ring carbon atoms
- 211/20 with hydrocarbon radicals, substituted by singly bound oxygen or sulfur atoms (bound to the same carbon atom [C07D 211/30](#))
- 211/22 by oxygen atoms
- 211/24 by sulfur atoms to which a second hetero atom is attached
- 211/26 with hydrocarbon radicals, substituted by nitrogen atoms
- 211/28 to which a second hetero atom is attached
- 211/30 with hydrocarbon radicals, substituted by doubly bound oxygen or sulfur atoms or by two oxygen or sulfur atoms singly bound to the same carbon atom
- 211/32 by oxygen atoms
- 211/34 with hydrocarbon radicals, substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 211/36 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 211/38 Halogen atoms or nitro radicals
- 211/40 Oxygen atoms
- 211/42 attached in position 3 or 5
- 211/44 attached in position 4
- 211/46 having a hydrogen atom as the second substituent in position 4

- 211/48 having an acyclic carbon atom attached in position 4
- 211/50 Aryl radical
- 211/52 having an aryl radical as the second substituent in position 4
- 211/54 Sulfur atoms
- 211/56 Nitrogen atoms ([nitro radicals C07D 211/38](#))
- 211/58 attached in position 4
- 211/60 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 211/62 attached in position 4
- 211/64 having an aryl radical as the second substituent in position 4
- 211/66 having a hetero atom as the second substituent in position 4
- 211/68 having one double bond between ring members or between a ring member and a non-ring member
- 211/70 with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 211/72 with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, directly attached to ring carbon atoms
- 211/74 Oxygen atoms
- 211/76 attached in position 2 or 6
- 211/78 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 211/80 having two double bonds between ring members or between ring members and non-ring members
- 211/82 with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 211/84 with hetero atoms or with carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen directly attached to ring carbon atoms
- 211/86 Oxygen atoms
- 211/88 attached in positions 2 and 6, e.g. glutarimide
- 211/90 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 211/92 with a hetero atom directly attached to the ring nitrogen atom
- 211/94 Oxygen atom, e.g. piperidine N-oxide
- 211/96 Sulfur atom
- 211/98 Nitrogen atom
- 213/00 Heterocyclic compounds containing six-membered rings, not condensed with other rings, with one nitrogen atom as the only ring hetero atom and three or more double bonds between ring members or between ring members and non-ring members**
- 213/02 having three double bonds between ring members or between ring members and non-ring members
- 213/04 having no bond between the ring nitrogen atom and a non-ring member or having only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- 213/06 containing only hydrogen and carbon atoms in addition to the ring nitrogen atom
- 213/08 Preparation by ring-closure
- 213/09 involving the use of ammonia, amines, amine salts, or nitriles
- 213/10 from acetaldehyde or cyclic polymers thereof
- 213/12 from unsaturated compounds
- 213/127 Preparation from compounds containing pyridine rings
- 213/133 Preparation by dehydrogenation of hydrogenated pyridine compounds
- 213/14 Preparation from compounds containing heterocyclic oxygen
- 213/16 containing only one pyridine ring
- 213/18 Salts thereof
- 213/20 Quaternary compounds thereof
- 213/22 containing two or more pyridine rings directly linked together, e.g. bipyridyl
- 213/24 with substituted hydrocarbon radicals attached to ring carbon atoms
- 213/26 Radicals substituted by halogen atoms or nitro radicals
- 213/28 Radicals substituted by singly-bound oxygen or sulfur atoms ([bound to the same carbon atom C07D 213/44](#))
- 213/30 Oxygen atoms
- 213/32 Sulfur atoms
- 213/34 to which a second heteroatom is attached
- 213/36 Radicals substituted by singly-bound nitrogen atoms ([nitro radicals C07D 213/26](#))
- 213/38 having only hydrogen, hydrocarbon radicals attached to the substituent nitrogen atom
- 213/40 Acylated substituent nitrogen atom
- 213/42 having hetero atoms attached to the substituent nitrogen atom ([nitro radicals C07D 213/26](#))
- 213/44 Radicals substituted by doubly-bound oxygen, sulfur, or nitrogen atoms, or by two such atoms singly-bound to the same carbon atom
- 213/46 Oxygen atoms
- 213/48 Aldehyde radicals
- 213/50 Ketonic radicals
- 213/51 Acetal radicals
- 213/52 Sulfur atoms
- 213/53 Nitrogen atoms
- 213/54 Radicals substituted by carbon atoms having three bonds to heteroatoms, with at the most one to halogen, e.g. ester or nitrile radicals
- 213/55 Acids; Esters
- 213/56 Amides
- 213/57 Nitriles
- 213/58 Amidines
- 213/59 with at least one of the bonds being to sulfur
- 213/60 with heteroatoms or with carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 213/61 Halogen atoms or nitro radicals
- 213/62 Oxygen or sulfur atoms
- 213/63 One oxygen atom
- 213/64 attached in position 2 or 6

- 213/643 2-Phenoxy pyridines; Derivatives thereof
- 213/647 and having in the molecule an acyl radical containing a saturated three-membered ring, e.g. chrysanthemumic acid esters
- 213/65 attached in position 3 or 5
- 213/66 having in position 3 an oxygen atom and in each of the positions 4 and 5 a carbon atom bound to an oxygen, sulfur or nitrogen atom, e.g. pyridoxal
- 213/67 2-Methyl-3-hydroxy-4,5-bis(hydroxy-methyl)pyridine, i.e. pyridoxine
- 213/68 attached in position 4
- 213/69 Two or more oxygen atoms
- 213/70 Sulfur atoms
- 213/71 to which a second hetero atom is attached
- 213/72 Nitrogen atoms ([nitro radicals C07D 213/61](#))
- 213/73 Unsubstituted amino or imino radicals
- 213/74 Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
- 213/75 Amino or imino radicals, acylated by carboxylic or carbonic acids, or by sulfur or nitrogen analogues thereof, e.g. carbamates
- 213/76 to which a second hetero atom is attached ([nitro radicals C07D 213/61](#))
- 213/77 Hydrazine radicals
- 213/78 Carbon atoms having three bonds to hetero atoms, with at the most one to halogen, e.g. ester or nitrile radicals
- 213/79 Acids; Esters
- 213/80 in position 3
- 213/803 Processes of preparation
- 213/807 by oxidation of pyridines or condensed pyridines
- 213/81 Amides; Imides
- 213/82 in position 3
- 213/83 Thioacids; Thioesters; Thioamides; Thioimides
- 213/84 Nitriles
- 213/85 in position 3
- 213/86 Hydrazides; Thio or imino analogues thereof
- 213/87 in position 3
- 213/88 Nicotinoylhydrazones
- 213/89 with hetero atoms directly attached to the ring nitrogen atom
- 213/90 having more than three double bonds between ring members or between ring members and non-ring members
- 215/00 Heterocyclic compounds containing quinoline or hydrogenated quinoline ring systems**
- 215/02 having no bond between the ring nitrogen atom and a non-ring member or having only hydrogen atoms or carbon atoms directly attached to the ring nitrogen atom
- 215/04 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to the ring carbon atoms
- 215/06 having only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to the ring nitrogen atom
- 215/08 with acylated ring nitrogen atom
- 215/10 Quaternary compounds
- 215/12 with substituted hydrocarbon radicals attached to ring carbon atoms
- 215/14 Radicals substituted by oxygen atoms
- 215/16 with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 215/18 Halogen atoms or nitro radicals
- 215/20 Oxygen atoms ([quinophthalones C09B 25/00](#))
- 215/22 attached in position 2 or 4
- 215/227 only one oxygen atom which is attached in position 2
- 215/233 only one oxygen atom which is attached in position 4
- 215/24 attached in position 8
- 215/26 Alcohols; Ethers thereof
- 215/28 with halogen atoms or nitro radicals in positions 5, 6 or 7
- 215/30 Metal salts; Chelates
- 215/32 Esters
- 215/34 Carbamates
- 215/36 Sulfur atoms ([C07D 215/24 takes precedence](#))
- 215/38 Nitrogen atoms ([nitro radicals C07D 215/18](#))
- 215/40 attached in position 8
- 215/42 attached in position 4
- 215/44 with aryl radicals attached to said nitrogen atoms
- 215/46 with hydrocarbon radicals, substituted by nitrogen atoms, attached to said nitrogen atoms
- 215/48 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 215/50 attached in position 4
- 215/52 with aryl radicals attached in position 2
- 215/54 attached in position 3
- 215/56 with oxygen atoms in position 4
- 215/58 with hetero atoms directly attached to the ring nitrogen atom
- 215/60 N-oxides
- 217/00 Heterocyclic compounds containing isoquinoline or hydrogenated isoquinoline ring systems**
- 217/02 with only hydrogen atoms or radicals containing only carbon and hydrogen atoms, directly attached to carbon atoms of the nitrogen-containing ring; Alkylene-bis-isoquinolines
- 217/04 with hydrocarbon or substituted hydrocarbon radicals attached to the ring nitrogen atom
- 217/06 with the ring nitrogen atom acylated by carboxylic or carbonic acids, or with sulfur or nitrogen analogues thereof, e.g. carbamates
- 217/08 with a hetero atom directly attached to the ring nitrogen atom
- 217/10 Quaternary compounds
- 217/12 with radicals, substituted by hetero atoms, attached to carbon atoms of the nitrogen-containing ring
- 217/14 other than aralkyl radicals
- 217/16 substituted by oxygen atoms
- 217/18 Aralkyl radicals

- 217/20 . . . with oxygen atoms directly attached to the aromatic ring of said aralkyl radical, e.g. papaverine
- 217/22 . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the nitrogen-containing ring
- 217/24 . . Oxygen atoms
- 217/26 . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 219/00 Heterocyclic compounds containing acridine or hydrogenated acridine ring systems**
- 219/02 . with only hydrogen, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the ring system
- 219/04 . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the ring system
- 219/06 . . Oxygen atoms
- 219/08 . . Nitrogen atoms ([acridine dyes C09B 15/00](#))
- 219/10 . . . attached in position 9
- 219/12 Amino-alkyl-amino radicals attached in position 9
- 219/14 . with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- 219/16 . with acyl radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- 221/00 Heterocyclic compounds containing six-membered rings having one nitrogen atom as the only ring hetero atom, not provided for by groups C07D 211/00 - C07D 219/00**
- 221/02 . condensed with carbocyclic rings or ring systems
- 221/04 . . Ortho- or peri-condensed ring systems
- 221/06 . . . Ring systems of three rings
- 221/08 Aza-anthracenes ([acridine C07D 219/00](#))
- 221/10 Aza-phenanthrenes
- 221/12 Phenanthridines
- 221/14 Aza-phenalenes, e.g. 1,8-naphthalimide
- 221/16 containing carbocyclic rings other than six-membered
- 221/18 . . . Ring systems of four or more rings
- 221/20 . . Spiro-condensed ring systems
- 221/22 . . Bridged ring systems
- 221/24 . . . Camphidines
- 221/26 . . . Benzomorphanes
- 221/28 . . . Morphinans
- 223/00 Heterocyclic compounds containing seven-membered rings having one nitrogen atom as the only ring hetero atom**
- NOTE**
- Hexamethylene imines or 3-aza-bicyclo [3.2.2] nonanes, having only hydrogen atoms attached to the ring carbon atoms, are classified in [C07D 295/00](#)
- 223/02 . not condensed with other rings
- 223/04 . . with only hydrogen atoms, halogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 223/06 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms ([halogen atoms C07D 223/04](#))
- 223/08 Oxygen atoms
- 223/10 attached in position 2
- 223/12 . . . Nitrogen atoms not forming part of a nitro radical
- 223/14 . condensed with carbocyclic rings or ring systems
- 223/16 . . Benzazepines; Hydrogenated benzazepines
- 223/18 . . Dibenzazepines; Hydrogenated dibenzazepines
- 223/20 . . . Dibenz [b, e] azepines; Hydrogenated dibenz [b, e] azepines
- 223/22 Dibenz [b, f] azepines; Hydrogenated dibenz [b, f] azepines
- 223/24 with hydrocarbon radicals, substituted by nitrogen atoms, attached to the ring nitrogen atom
- 223/26 having a double bond between positions 10 and 11
- 223/28 having a single bond between positions 10 and 11
- 223/30 with hetero atoms directly attached to the ring nitrogen atom
- 223/32 . . containing carbocyclic rings other than six-membered
- 225/00 Heterocyclic compounds containing rings of more than seven members having one nitrogen atom as the only ring hetero atom**
- NOTE**
- Polymethyleneimines with at least five ring members and having only hydrogen atoms attached to the ring carbon atoms are classified in group [C07D 295/00](#)
- 225/02 . not condensed with other rings
- 225/04 . condensed with carbocyclic rings or ring systems
- 225/06 . . condensed with one six-membered ring
- 225/08 . . condensed with two six-membered rings
- 227/00 Heterocyclic compounds containing rings having one nitrogen atom as the only ring hetero atom, according to more than one of groups C07D 203/00 - C07D 225/00**
- NOTE**
- Polymethyleneimines with at least five ring members and having only hydrogen atoms attached to the ring carbon atoms are classified in group [C07D 295/00](#)
- 227/02 . with only hydrogen or carbon atoms directly attached to the ring nitrogen atom
- 227/04 . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms
- 227/06 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 227/08 Oxygen atoms
- 227/087 One doubly-bound oxygen atom in position 2, e.g. lactams

- 227/093 Two doubly-bound oxygen atoms attached to the carbon atoms adjacent to the ring nitrogen atom, e.g. dicarboxylic acid imides
- 227/10 . . . Nitrogen atoms not forming part of a nitro radical
- 227/12 . with hetero atoms directly attached to the ring nitrogen atom
- 229/00 Heterocyclic compounds containing rings of less than five members having two nitrogen atoms as the only ring hetero atoms**
- 229/02 . containing three-membered rings
- 231/00 Heterocyclic compounds containing 1,2-diazole or hydrogenated 1,2-diazole rings**
- 231/02 . not condensed with other rings
- 231/04 . . having no double bonds between ring members or between ring members and non-ring members
- 231/06 . . having one double bond between ring members or between ring members and non-ring members
- 231/08 . . . with oxygen or sulfur atoms directly attached to ring carbon atoms
- 231/10 . . having two or three double bonds between ring members or between ring members and non-ring members
- 231/12 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 231/14 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 231/16 Halogen atoms or nitro radicals
- 231/18 One oxygen or sulfur atom
- 231/20 One oxygen atom attached in positions 3 or 5
- 231/22 with aryl radicals attached to ring nitrogen atoms
- 231/24 having sulfone or sulfonic acid radicals in the molecule
- 231/26 1-Phenyl-3-methyl-5- pyrazolones, unsubstituted or substituted on the phenyl ring
- 231/28 Two oxygen or sulfur atoms
- 231/30 attached in position 3 and 5
- 231/32 Oxygen atoms
- 231/34 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached in position 4
- 231/36 with hydrocarbon radicals, substituted by hetero atoms, attached in position 4
- 231/38 Nitrogen atoms ([nitro radicals C07D 231/16](#))
- 231/40 Acylated on said nitrogen atom
- 231/42 Benzene-sulfonamido pyrazoles
- 231/44 Oxygen and nitrogen or sulfur and nitrogen atoms
- 231/46 Oxygen atom in position 3 or 5 and nitrogen atom in position 4
- 231/48 with hydrocarbon radicals attached to said nitrogen atom
- 231/50 Acylated on said nitrogen atom
- 231/52 Oxygen atom in position 3 and nitrogen atom in position 5, or *vice versa*
- 231/54 . condensed with carbocyclic rings or ring-systems
- 231/56 . . Benzopyrazoles; Hydrogenated benzopyrazoles
- 233/00 Heterocyclic compounds containing 1,3-diazole or hydrogenated 1,3-diazole rings, not condensed with other rings**
- 233/02 . having no double bonds between ring members or between ring members and non-ring members
- 233/04 . having one double bond between ring members or between a ring member and a non-ring member
- 233/06 . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 233/08 . . . with alkyl radicals, containing more than four carbon atoms, directly attached to ring carbon atoms
- 233/10 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring nitrogen atoms
- 233/12 with substituted hydrocarbon radicals attached to ring nitrogen atoms
- 233/14 Radicals substituted by oxygen atoms
- 233/16 Radicals substituted by nitrogen atoms
- 233/18 Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one to halogen, e.g. ester or nitrile radicals
- 233/20 . . with substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 233/22 . . . Radicals substituted by oxygen atoms
- 233/24 . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 233/26 . . . Radicals substituted by carbon atoms having three bonds to hetero atoms
- 233/28 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 233/30 . . . Oxygen or sulfur atoms
- 233/32 One oxygen atom
- 233/34 Ethylene-urea
- 233/36 with hydrocarbon radicals, substituted by nitrogen atoms, attached to ring nitrogen atoms
- 233/38 with acyl radicals or hetero atoms directly attached to ring nitrogen atoms
- 233/40 Two or more oxygen atoms
- 233/42 Sulfur atoms
- 233/44 . . . Nitrogen atoms not forming part of a nitro radical
- 233/46 with only hydrogen atoms attached to said nitrogen atoms
- 233/48 with acyclic hydrocarbon or substituted acyclic hydrocarbon radicals, attached to said nitrogen atoms
- 233/50 with carbocyclic radicals directly attached to said nitrogen atoms
- 233/52 with hetero atoms directly attached to said nitrogen atoms
- 233/54 . having two double bonds between ring members or between ring members and non-ring members
- 233/56 . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring carbon atoms

- 233/58 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to ring nitrogen atoms
- 233/60 . . . with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to ring nitrogen atoms
- 233/61 . . . with hydrocarbon radicals, substituted by nitrogen atoms not forming part of a nitro radical, attached to ring nitrogen atoms
- 233/62 . . . with triarylmethyl radicals attached to ring nitrogen atoms ([triarylmethane dyes C09B 11/26](#))
- 233/64 . . with substituted hydrocarbon radicals attached to ring carbon atoms, e.g. histidine
- 233/66 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 233/68 . . . Halogen atoms
- 233/70 . . . One oxygen atom
- 233/72 . . . Two oxygen atoms, e.g. hydantoin
- 233/74 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, attached to other ring members
- 233/76 with substituted hydrocarbon radicals attached to the third ring carbon atom
- 233/78 Radicals substituted by oxygen atoms
- 233/80 with hetero atoms or acyl radicals directly attached to ring nitrogen atoms
- 233/82 Halogen atoms
- 233/84 . . . Sulfur atoms
- 233/86 . . . Oxygen and sulfur atoms, e.g. thiohydantoin
- 233/88 . . . Nitrogen atoms, e.g. allantoin ([nitro radicals C07D 233/91](#))
- 233/90 . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 233/91 . . . Nitro radicals
- 233/92 attached in position 4 or 5
- 233/93 with hydrocarbon radicals, substituted by halogen atoms, attached to other ring members
- 233/94 with hydrocarbon radicals, substituted by oxygen or sulfur atoms, attached to other ring members
- 233/95 with hydrocarbon radicals, substituted by nitrogen atoms, attached to other ring members
- 233/96 . . having three double bonds between ring members or between ring members and non-ring members
- 235/00 Heterocyclic compounds containing 1,3-diazole or hydrogenated 1,3-diazole rings, condensed with other rings**
- 235/02 . . condensed with carbocyclic rings or ring systems
- 235/04 . . Benzimidazoles; Hydrogenated benzimidazoles
- 235/06 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2
- 235/08 Radicals containing only hydrogen and carbon atoms
- 235/10 Radicals substituted by halogen atoms or nitro radicals
- 235/12 Radicals substituted by oxygen atoms
- 235/14 Radicals substituted by nitrogen atoms ([by nitro radicals C07D 235/10](#))
- 235/16 Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 235/18 . . . with aryl radicals directly attached in position 2
- 235/20 . . . Two benzimidazolyl-2 radicals linked together directly or via a hydrocarbon or substituted hydrocarbon radical
- 235/22 . . . with hetero atoms directly attached to ring nitrogen atoms ([C07D 235/10 takes precedence](#))
- 235/24 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2
- 235/26 Oxygen atoms
- 235/28 Sulfur atoms
- 235/30 Nitrogen atoms not forming part of a nitro radical
- 235/32 Benzimidazole-2-carbamic acids, unsubstituted or substituted; Esters thereof; Thio-analogues thereof
- 237/00 Heterocyclic compounds containing 1,2-diazine or hydrogenated 1,2-diazine rings**
- 237/02 . . not condensed with other rings
- 237/04 . . having less than three double bonds between ring members or between ring members and non-ring members
- 237/06 . . having three double bonds between ring members or between ring members and non-ring members
- 237/08 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 237/10 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 237/12 Halogen atoms or nitro radicals
- 237/14 Oxygen atoms
- 237/16 Two oxygen atoms
- 237/18 Sulfur atoms
- 237/20 Nitrogen atoms ([nitro radicals C07D 237/12](#))
- 237/22 Nitrogen and oxygen atoms
- 237/24 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 237/26 . . condensed with carbocyclic rings or ring systems
- 237/28 . . Cinnolines
- 237/30 . . Phthalazines
- 237/32 . . . with oxygen atoms directly attached to carbon atoms of the nitrogen-containing ring
- 237/34 . . . with nitrogen atoms directly attached to carbon atoms of the nitrogen-containing ring, e.g. hydrazine radicals
- 237/36 . . Benzo-cinnolines
- 239/00 Heterocyclic compounds containing 1,3-diazine or hydrogenated 1,3-diazine rings**
- 239/02 . . not condensed with other rings
- 239/04 . . having no double bonds between ring members or between ring members and non-ring members
- 239/06 . . having one double bond between ring members or between a ring member and a non-ring member

- 239/08 . . . with heteroatoms directly attached in position 2
- 239/10 Oxygen or sulfur atoms
- 239/12 Nitrogen atoms not forming part of a nitro radical
- 239/14 with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals attached to said nitrogen atoms
- 239/16 acylated on said nitrogen atoms
- 239/18 with hetero atoms attached to said nitrogen atoms, except nitro radicals, e.g. hydrazine radicals
- 239/20 . . having two double bonds between ring members or between ring members and non-ring members
- 239/22 . . . with hetero atoms directly attached to ring carbon atoms
- 239/24 . . having three or more double bonds between ring members or between ring members and non-ring members
- 239/26 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 239/28 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to ring carbon atoms
- 239/30 Halogen atoms or nitro radicals
- 239/32 One oxygen, sulfur or nitrogen atom
- 239/34 One oxygen atom
- 239/36 as doubly bound atom or as unsubstituted hydroxy radical
- 239/38 One sulfur atom
- 239/40 as doubly bound sulfur atom or as unsubstituted mercapto radical
- 239/42 One nitrogen atom ([nitro radicals C07D 239/30](#); [benzenesulfonamido-pyrimidines C07D 239/69](#))
- 239/46 Two or more oxygen, sulfur or nitrogen atoms ([benzenesulfonamido-pyrimidines C07D 239/69](#))
- 239/47 One nitrogen atom and one oxygen or sulfur atom, e.g. cytosine
- 239/48 Two nitrogen atoms
- 239/49 with an aralkyl radical, or substituted aralkyl radical, attached in position 5, e.g. trimethoprim
- 239/50 Three nitrogen atoms
- 239/52 Two oxygen atoms
- 239/54 as doubly bound oxygen atoms or as unsubstituted hydroxy radicals
- 239/545 with other hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to ring carbon atoms
- 239/553 with halogen atoms or nitro radicals directly attached to ring carbon atoms, e.g. fluorouracil
- 239/557 with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, directly attached to ring carbon atoms, e.g. orotic acid
- 239/56 One oxygen atom and one sulfur atom
- 239/58 Two sulfur atoms
- 239/60 Three or more oxygen or sulfur atoms
- 239/62 Barbituric acids
- 239/64 Salts of organic bases; Organic double compounds
- 239/66 Thiobarbituric acids
- 239/68 Salts of organic bases; Organic double compounds
- 239/69 Benzenesulfonamido-pyrimidines
- 239/70 . condensed with carbocyclic rings or ring systems
- 239/72 . . Quinazolines; Hydrogenated quinazolines
- 239/74 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached to ring carbon atoms of the hetero ring
- 239/76 N-oxides
- 239/78 . . . with hetero atoms directly attached in position 2
- 239/80 Oxygen atoms
- 239/82 with an aryl radical attached in position 4
- 239/84 Nitrogen atoms
- 239/86 . . . with hetero atoms directly attached in position 4
- 239/88 Oxygen atoms
- 239/90 with acyclic radicals attached in positions 2 or 3
- 239/91 with aryl or aralkyl radicals attached in positions 2 or 3
- 239/92 with hetero atoms directly attached to nitrogen atoms of the hetero ring
- 239/93 Sulfur atoms
- 239/94 Nitrogen atoms
- 239/95 . . . with hetero atoms directly attached in positions 2 and 4
- 239/96 Two oxygen atoms
- 241/00 Heterocyclic compounds containing 1,4-diazine or hydrogenated 1,4-diazine rings**
- NOTE**
- Piperazines with only hydrogen atoms directly attached to ring carbon atoms are classified in group [C07D 295/00](#)
- 241/02 . not condensed with other rings
- 241/04 . . having no double bonds between ring members or between ring members and non-ring members
- 241/06 . . having one or two double bonds between ring members or between ring members and non-ring members
- 241/08 . . . with oxygen atoms directly attached to ring carbon atoms
- 241/10 . . having three double bonds between ring members or between ring members and non-ring members
- 241/12 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 241/14 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 241/16 Halogen atoms; Nitro radicals
- 241/18 Oxygen or sulfur atoms
- 241/20 Nitrogen atoms ([nitro radicals C07D 241/16](#))
- 241/22 Benzenesulfonamido pyrazines

- 241/24 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 241/26 with nitrogen atoms directly attached to ring carbon atoms
- 241/28 in which said hetero-bound carbon atoms have double bonds to oxygen, sulfur or nitrogen atoms
- WARNING**
- Group [C07D 241/28](#) is impacted by reclassification into group [C07D 241/34](#).
- Groups [C07D 241/28](#) and [C07D 241/34](#) should be considered in order to perform a complete search.
- 241/30 in which said hetero-bound carbon atoms are part of a substructure — C(=X)—X—C(=X)—X— in which X is an oxygen or sulfur atom or an imino radical, e.g. imidoylguanidines
- 241/32 (Amino-pyrazinoyl) guanidines
- 241/34 (Amino-pyrazine carbonamido) guanidines
- WARNING**
- Group [C07D 241/34](#) is incomplete pending reclassification of documents from group [C07D 241/28](#).
- Groups [C07D 241/28](#) and [C07D 241/34](#) should be considered in order to perform a complete search.
- 241/36 . . condensed with carbocyclic rings or ring systems
- 241/38 . . with only hydrogen or carbon atoms directly attached to the ring nitrogen atoms
- 241/40 . . . Benzopyrazines
- 241/42 with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring
- 241/44 with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the hetero ring
- 241/46 . . . Phenazines
- 241/48 with hydrocarbon radicals, substituted by nitrogen atoms, directly attached to the ring nitrogen atoms
- 241/50 . . with hetero atoms directly attached to ring nitrogen atoms
- 241/52 . . . Oxygen atoms
- 241/54 . . . Nitrogen atoms
- 243/00 Heterocyclic compounds containing seven-membered rings having two nitrogen atoms as the only ring hetero atoms**
- 243/02 . . having the nitrogen atoms in positions 1,2
- 243/04 . . having the nitrogen atoms in positions 1,3
- 243/06 . . having the nitrogen atoms in positions 1,4
- 243/08 . . not condensed with other rings
- 243/10 . . condensed with carbocyclic rings or ring systems
- 243/12 . . . 1,5-Benzodiazepines; Hydrogenated 1,5-benzodiazepines
- 243/14 . . . 1,4-Benzodiazepines; Hydrogenated 1,4-benzodiazepines
- 243/16 substituted in position 5 by aryl radicals
- 243/18 substituted in position 2 by nitrogen, oxygen or sulfur atoms
- 243/20 Nitrogen atoms
- 243/22 Sulfur atoms
- 243/24 Oxygen atoms
- 243/26 Preparation from compounds already containing the benzodiazepine skeleton
- 243/28 Preparation including building-up the benzodiazepine skeleton from compounds containing no hetero rings
- 243/30 Preparation including building-up the benzodiazepine skeleton from compounds already containing hetero rings
- 243/32 containing a phthalimide or hydrogenated phthalimide ring system
- 243/34 containing a quinazoline or hydrogenated quinazoline ring system
- 243/36 containing an indole or hydrogenated indole ring system
- 243/38 . . . [b, e]- or [b, f]-condensed with six-membered rings
- 245/00 Heterocyclic compounds containing rings of more than seven members having two nitrogen atoms as the only ring hetero atoms**
- 245/02 . . not condensed with other rings
- 245/04 . . condensed with carbocyclic rings or ring systems
- 245/06 . . condensed with one six-membered ring
- 247/00 Heterocyclic compounds containing rings having two nitrogen atoms as the only ring hetero atoms, according to more than one of groups [C07D 229/00](#) - [C07D 245/00](#)**
- 247/02 . . having the nitrogen atoms in positions 1 and 3
- 249/00 Heterocyclic compounds containing five-membered rings having three nitrogen atoms as the only ring hetero atoms**
- 249/02 . . not condensed with other rings
- 249/04 . . 1,2,3-Triazoles; Hydrogenated 1,2,3-triazoles
- 249/06 . . . with aryl radicals directly attached to ring atoms
- 249/08 . . 1,2,4-Triazoles; Hydrogenated 1,2,4-triazoles
- 249/10 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 249/12 Oxygen or sulfur atoms
- 249/14 Nitrogen atoms
- 249/16 . . condensed with carbocyclic rings or ring systems
- 249/18 . . Benzotriazoles
- 249/20 . . . with aryl radicals directly attached in position 2
- 249/22 . . Naphthotriazoles
- 249/24 . . . with stilbene radicals attached in position 2
- 251/00 Heterocyclic compounds containing 1,3,5-triazine rings**

- 251/02 . not condensed with other rings
- 251/04 . . having no double bonds between ring members or between ring members and non-ring members
- 251/06 . . . with hetero atoms directly attached to ring nitrogen atoms
- 251/08 . . having one double bond between ring members or between a ring member and a non-ring member
- 251/10 . . having two double bonds between ring members or between ring members and non-ring members
- 251/12 . . having three double bonds between ring members or between ring members and non-ring members
- 251/14 . . . with hydrogen or carbon atoms directly attached to at least one ring carbon atom
- 251/16 to only one ring carbon atom
- 251/18 with nitrogen atoms directly attached to the two other ring carbon atoms, e.g. guanamines
- 251/20 with no nitrogen atoms directly attached to a ring carbon atom
- 251/22 to two ring carbon atoms
- 251/24 to three ring carbon atoms
- 251/26 . . . with only hetero atoms directly attached to ring carbon atoms
- 251/28 Only halogen atoms, e.g. cyanuric chloride
- 251/30 Only oxygen atoms
- 251/32 Cyanuric acid; Isocyanuric acid
- 251/34 Cyanuric or isocyanuric esters
- 251/36 having halogen atoms directly attached to ring nitrogen atoms
- 251/38 Sulfur atoms
- 251/40 Nitrogen atoms
- 251/42 One nitrogen atom
- 251/44 with halogen atoms attached to the two other ring carbon atoms
- 251/46 with oxygen or sulfur atoms attached to the two other ring carbon atoms
- 251/48 Two nitrogen atoms
- 251/50 with a halogen atom attached to the third ring carbon atom
- 251/52 with an oxygen or sulfur atom attached to the third ring carbon atom
- 251/54 Three nitrogen atoms
- 251/56 Preparation of melamine
- 251/58 from cyanamide, dicyanamide or calcium cyanamide
- 251/60 from urea or from carbon dioxide and ammonia
- 251/62 Purification of melamine
- 251/64 Condensation products of melamine with aldehydes; Derivatives thereof ([polycondensation products C08G](#))
- 251/66 Derivatives of melamine in which a hetero atom is directly attached to a nitrogen atom of melamine
- 251/68 Triazinylamino stilbenes
- 251/70 Other substituted melamines
- 251/72 . condensed with carbocyclic rings or ring systems
- 253/00 Heterocyclic compounds containing six-membered rings having three nitrogen atoms as the only ring hetero atoms, not provided for by group [C07D 251/00](#)**
- 253/02 . not condensed with other rings
- 253/04 . . 1,2,3-Triazines
- 253/06 . . 1,2,4-Triazines
- 253/065 . . . having three double bonds between ring members or between ring members and non-ring members
- 253/07 with hetero atoms, or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 253/075 Two hetero atoms, in positions 3 and 5
- 253/08 . condensed with carbocyclic rings or ring systems
- 253/10 . . Condensed 1, 2,4-triazines; Hydrogenated condensed 1,2,4-triazines
- 255/00 Heterocyclic compounds containing rings having three nitrogen atoms as the only ring hetero atoms, not provided for by groups [C07D 249/00](#) - [C07D 253/00](#)**
- 255/02 . not condensed with other rings
- 255/04 . condensed with carbocyclic rings or ring systems
- 257/00 Heterocyclic compounds containing rings having four nitrogen atoms as the only ring hetero atoms**
- 257/02 . not condensed with other rings
- 257/04 . . Five-membered rings
- 257/06 . . . with nitrogen atoms directly attached to the ring carbon atom
- 257/08 . . Six-membered rings
- 257/10 . condensed with carbocyclic rings or ring systems
- 257/12 . . Six-membered rings having four nitrogen atoms
- 259/00 Heterocyclic compounds containing rings having more than four nitrogen atoms as the only ring hetero atoms**
- Heterocyclic compounds having nitrogen and oxygen as the only ring hetero atoms**
- 261/00 Heterocyclic compounds containing 1,2-oxazole or hydrogenated 1,2-oxazole rings**
- 261/02 . not condensed with other rings
- 261/04 . . having one double bond between ring members or between a ring member and a non-ring member
- 261/06 . . having two or more double bonds between ring members or between ring members and non-ring members
- 261/08 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 261/10 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 261/12 Oxygen atoms
- 261/14 Nitrogen atoms
- 261/16 Benzene-sulphonamido isoxazoles
- 261/18 Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen
- 261/20 . condensed with carbocyclic rings or ring systems
- 263/00 Heterocyclic compounds containing 1,3-oxazole or hydrogenated 1,3-oxazole rings**
- 263/02 . not condensed with other rings
- 263/04 . . having no double bonds between ring members or between ring members and non-ring members

- 263/06 . . . with hydrocarbon radicals, substituted by oxygen atoms, attached to ring carbon atoms
- 263/08 . . having one double bond between ring members or between a ring member and a non-ring member
- 263/10 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 263/12 with radicals containing only hydrogen and carbon atoms
- 263/14 with radicals substituted by oxygen atoms
- 263/16 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 263/18 Oxygen atoms
- 263/20 attached in position 2
- 263/22 with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to other ring carbon atoms
- 263/24 with hydrocarbon radicals, substituted by oxygen atoms, attached to other ring carbon atoms
- 263/26 with hetero atoms or acyl radicals directly attached to the ring nitrogen atom
- 263/28 Nitrogen atoms not forming part of a nitro radical
- 263/30 . . having two or three double bonds between ring members or between ring members and non-ring members
- 263/32 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 263/34 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 263/36 One oxygen atom
- 263/38 attached in position 2
- 263/40 attached in position 4
- 263/42 attached in position 5
- 263/44 Two oxygen atoms
- 263/46 Sulfur atoms
- 263/48 Nitrogen atoms not forming part of a nitro radical
- 263/50 Benzene-sulphonamido oxazoles
- 263/52 . condensed with carbocyclic rings or ring systems
- 263/54 . . Benzoxazoles; Hydrogenated benzoxazoles
- 263/56 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 2
- 263/57 Aryl or substituted aryl radicals
- 263/58 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2
- 263/60 . . Naphthoxazoles; Hydrogenated naphthoxazoles
- 263/62 . . having two or more ring systems containing condensed 1,3-oxazole rings
- 263/64 . . . linked in positions 2 and 2' by chains containing six-membered aromatic rings or ring systems containing such rings
- 265/00 Heterocyclic compounds containing six-membered rings having one nitrogen atom and one oxygen atom as the only ring hetero atoms**
- NOTE**
- Morpholines having only hydrogen atoms attached to the ring carbon atoms are classified in [C07D 295/00](#)
- 265/02 . 1,2-Oxazines; Hydrogenated 1,2-oxazines
- 265/04 . 1,3-Oxazines; Hydrogenated 1,3-oxazines
- 265/06 . . . not condensed with other rings
- 265/08 . . . having one double bond between ring members or between a ring member and a non-ring member
- 265/10 with oxygen atoms directly attached to ring carbon atoms
- 265/12 . . condensed with carbocyclic rings or ring systems
- 265/14 . . . condensed with one six-membered ring
- 265/16 with only hydrogen or carbon atoms directly attached in positions 2 and 4
- 265/18 with hetero atoms directly attached in position 2
- 265/20 with hetero atoms directly attached in position 4
- 265/22 Oxygen atoms
- 265/24 with hetero atoms directly attached in positions 2 and 4
- 265/26 Two oxygen atoms, e.g. isatoic anhydride
- 265/28 . 1,4-Oxazines; Hydrogenated 1,4-oxazines
- 265/30 . . not condensed with other rings
- 265/32 . . . with oxygen atoms directly attached to ring carbon atoms
- 265/33 Two oxygen atoms, in positions 3 and 5
- 265/34 . . condensed with carbocyclic rings
- 265/36 . . . condensed with one six-membered ring
- 265/38 . . . [b, e]-condensed with two six-membered rings
- 267/00 Heterocyclic compounds containing rings of more than six members having one nitrogen atom and one oxygen atom as the only ring hetero atoms**
- 267/02 . Seven-membered rings
- 267/04 . . having the hetero atoms in positions 1 and 2
- 267/06 . . having the hetero atoms in positions 1 and 3
- 267/08 . . having the hetero atoms in positions 1 and 4
- 267/10 . . . not condensed with other rings
- 267/12 . . . condensed with carbocyclic rings or ring systems
- 267/14 condensed with one six-membered ring
- 267/16 condensed with two six-membered rings
- 267/18 [b, e]-condensed
- 267/20 [b, f]-condensed
- 267/22 . Eight-membered rings
- 269/00 Heterocyclic compounds containing rings having one nitrogen atom and one oxygen atom as the only ring hetero atoms according to more than one of groups [C07D 261/00](#) - [C07D 267/00](#)**
- 269/02 . having the hetero atoms in positions 1 and 3
- 271/00 Heterocyclic compounds containing five-membered rings having two nitrogen atoms and one oxygen atom as the only ring hetero atoms**
- 271/02 . not condensed with other rings

271/04	. . 1,2,3-Oxadiazoles; Hydrogenated 1,2,3-oxadiazoles	277/20	. . having two or three double bonds between ring members or between ring members and non-ring members
271/06	. . 1,2,4-Oxadiazoles; Hydrogenated 1,2,4-oxadiazoles	277/22	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
271/07	. . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical	277/24	. . . . Radicals substituted by oxygen atoms
271/08	. . 1,2,5-Oxadiazoles; Hydrogenated 1,2,5-oxadiazoles	277/26	. . . . Radicals substituted by sulfur atoms
271/10	. . 1,3,4-Oxadiazoles; Hydrogenated 1,3,4-oxadiazoles	277/28	. . . . Radicals substituted by nitrogen atoms
271/107	. . . with two aryl or substituted aryl radicals attached in positions 2 and 5	277/30	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
271/113	. . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical	277/32	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
271/12	. condensed with carbocyclic rings or ring systems	277/34	. . . . Oxygen atoms
273/00	Heterocyclic compounds containing rings having nitrogen and oxygen atoms as the only ring hetero atoms, not provided for by groups C07D 261/00 - C07D 271/00	277/36	. . . . Sulfur atoms
273/01	. having one nitrogen atom	277/38	. . . . Nitrogen atoms
273/02	. having two nitrogen atoms and only one oxygen atom	277/40	. . . . . Unsubstituted amino or imino radicals
273/04	. . Six-membered rings	277/42	. . . . . Amino or imino radicals substituted by hydrocarbon or substituted hydrocarbon radicals
273/06	. . Seven-membered rings	277/44	. . . . . Acylated amino or imino radicals
273/08	. having two nitrogen atoms and more than one oxygen atom	277/46	. . . . . by carboxylic acids, or sulfur or nitrogen analogues thereof
		277/48	. . . . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof, e.g. carbonylguanidines
		277/50	. . . . . Nitrogen atoms bound to hetero atoms (nitro radicals C07D 277/58)
		277/52	. . . . . to sulfur atoms, e.g. sulfonamides
		277/54	. . . . Nitrogen and either oxygen or sulfur atoms
		277/56	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
		277/58	. . . . Nitro radicals
		277/587	. . . with aliphatic hydrocarbon radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms, said aliphatic radicals being substituted in the alpha-position to the ring by a hetero atom, e.g. $\begin{array}{c} -N \\ | \\ \text{---}C\text{---} \\ | \\ S \\ | \\ Z \end{array}-(CH_2)_m-C\equiv$ with m ≥ 0 , Z being a singly or a doubly bound hetero atom
		277/593	. . . . Z being doubly bound oxygen or doubly bound nitrogen, which nitrogen is part of a possibly substituted oximino radical
		277/60	. condensed with carbocyclic rings or ring-systems
		277/62	. . Benzothiazoles
		277/64	. . . with only hydrocarbon or substituted hydrocarbon radicals attached in position 2
		277/66	. . . . with aromatic rings or ring systems directly attached in position 2
		277/68	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2
277/14	. . . . Oxygen atoms	277/70	. . . . Sulfur atoms
277/16	. . . . Sulfur atoms	277/72	. . . . . 2-Mercaptobenzothiazole
277/18	. . . . Nitrogen atoms	277/74	. . . . . Sulfur atoms substituted by carbon atoms

277/76	. . . . . Sulfur atoms attached to a second hetero atom	285/00	Heterocyclic compounds containing rings having nitrogen and sulfur atoms as the only ring hetero atoms, not provided for by groups C07D 275/00 - C07D 283/00
277/78	. . . . . to a sulfur atom		
277/80	. . . . . to a nitrogen atom		
277/82	. . . . . Nitrogen atoms	285/01	. Five-membered rings
277/84	. . Naphthothiazoles	285/02	. . Thiadiazoles; Hydrogenated thiadiazoles
279/00	Heterocyclic compounds containing six-membered rings having one nitrogen atom and one sulfur atom as the only ring hetero atoms	285/04	. . . not condensed with other rings
	NOTE	285/06	. . . . 1,2,3-Thiadiazoles; Hydrogenated 1,2,3-thiadiazoles
	Thiomorpholines having only hydrogen atoms attached to the ring carbon atoms are classified in C07D 295/00	285/08	. . . . 1,2,4-Thiadiazoles; Hydrogenated 1,2,4-thiadiazoles
		285/10	. . . . 1,2,5-Thiadiazoles; Hydrogenated 1,2,5-thiadiazoles
		285/12	. . . . 1,3,4-Thiadiazoles; Hydrogenated 1,3,4-thiadiazoles
279/02	. 1,2-Thiazines; Hydrogenated 1,2-thiazines	285/125	. . . . . with oxygen, sulfur or nitrogen atoms, directly attached to ring carbon atoms, the nitrogen atoms not forming part of a nitro radical
279/04	. 1,3-Thiazines; Hydrogenated 1,3-thiazines		
279/06	. . not condensed with other rings	285/13	. . . . . Oxygen atoms
279/08	. . condensed with carbocyclic rings or ring systems	285/135	. . . . . Nitrogen atoms
279/10	. 1,4-Thiazines; Hydrogenated 1,4-thiazines	285/14	. . . condensed with carbocyclic rings or ring systems
279/12	. . not condensed with other rings		
279/14	. . condensed with carbocyclic rings or ring systems	285/15	. Six-membered rings
279/16	. . . condensed with one six-membered ring	285/16	. . Thiadiazines; Hydrogenated thiadiazines
279/18	. . . [b, e]-condensed with two six-membered rings	285/18	. . . 1,2,4-Thiadiazines; Hydrogenated 1,2,4-thiadiazines
279/20	. . . . with hydrogen atoms directly attached to the ring nitrogen atom		
279/22	. . . . with carbon atoms directly attached to the ring nitrogen atom	285/20	. . . . condensed with carbocyclic rings or ring systems
279/24	. . . . . with hydrocarbon radicals, substituted by amino radicals, attached to the ring nitrogen atom	285/22	. . . . . condensed with one six-membered ring
		285/24	. . . . . with oxygen atoms directly attached to the ring sulfur atom
279/26	. . . . . without other substituents attached to the ring system	285/26	. . . . . substituted in position 6 or 7 by sulfamoyl or substituted sulfamoyl radicals
279/28	. . . . . with other substituents attached to the ring system		
279/30	. . . . . with acyl radicals attached to the ring nitrogen atom	285/28	. . . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached in position 3
279/32	. . . . with hetero atoms directly attached to the ring nitrogen atom		
279/34	. . . . with hetero atoms directly attached to the ring sulfur atom	285/30	. . . . . with hydrocarbon radicals, substituted by hetero atoms attached in position 3
279/36	. . . [b, e]-condensed, at least one with a further condensed benzene ring	285/32	. . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 3
281/00	Heterocyclic compounds containing rings of more than six members having one nitrogen atom and one sulfur atom as the only ring hetero atoms		
281/02	. Seven-membered rings		
281/04	. . having the hetero atoms in positions 1 and 4	285/34	. . . 1,3,5-Thiadiazines; Hydrogenated 1,3,5-thiadiazines
281/06	. . . not condensed with other rings		
281/08	. . . condensed with carbocyclic rings or ring systems	285/36	. Seven-membered rings
		285/38	. Eight-membered rings
281/10	. . . . condensed with one six-membered ring		
281/12	. . . . condensed with two six-membered rings	291/00	Heterocyclic compounds containing rings having nitrogen, oxygen and sulfur atoms as the only ring hetero atoms
281/14	. . . . . [b, e]-condensed		
281/16	. . . . . [b, f]-condensed	291/02	. not condensed with other rings
281/18	. Eight-membered rings	291/04	. . Five-membered rings
283/00	Heterocyclic compounds containing rings having one nitrogen atom and one sulfur atom as the only ring hetero atoms, according to more than one of groups C07D 275/00 - C07D 281/00	291/06	. . Six-membered rings
		291/08	. condensed with carbocyclic rings or ring systems
283/02	. having the hetero atoms in positions 1 and 3	293/00	Heterocyclic compounds containing rings having nitrogen and selenium or nitrogen and tellurium, with or without oxygen or sulfur atoms, as the ring hetero atoms

- 293/02 . not condensed with other rings
- 293/04 . . Five-membered rings
- 293/06 . . . Selenazoles; Hydrogenated selenazoles
- 293/08 . . Six-membered rings
- 293/10 . condensed with carbocyclic rings or ring systems
- 293/12 . . Selenazoles; Hydrogenated selenazoles
- 295/00 Heterocyclic compounds containing polymethylene-imine rings with at least five ring members, 3-azabicyclo [3.2.2.] nonane, piperazine, morpholine or thiomorpholine rings, having only hydrogen atoms directly attached to the ring carbon atoms**
- 295/02 . containing only hydrogen and carbon atoms in addition to the ring hetero elements
- 295/023 . . Preparation; Separation; Stabilisation; Use of additives
- 295/027 . . containing only one hetero ring
- 295/03 . . . with the ring nitrogen atoms directly attached to acyclic carbon atoms
- 295/033 . . . with the ring nitrogen atoms directly attached to carbocyclic rings
- 295/037 . . with quaternary ring nitrogen atoms
- 295/04 . with substituted hydrocarbon radicals attached to ring nitrogen atoms
- 295/06 . . substituted by halogen atoms or nitro radicals
- 295/067 . . . with the ring nitrogen atoms and the substituents attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/073 . . . with the ring nitrogen atoms and the substituents separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/08 . . substituted by singly bound oxygen or sulfur atoms
- 295/084 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/088 to an acyclic saturated chain
- 295/092 with aromatic radicals attached to the chain
- 295/096 . . . with the ring nitrogen atoms and the oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/10 . . substituted by doubly bound oxygen or sulfur atoms ([acylated ring nitrogen atoms C07D 295/16](#))
- 295/104 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/108 to an acyclic saturated chain
- 295/112 . . . with the ring nitrogen atoms and the doubly bound oxygen or sulfur atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/116 with the doubly bound oxygen or sulfur atoms directly attached to a carbocyclic ring
- 295/12 . . substituted by singly or doubly bound nitrogen atoms ([nitro radicals C07D 295/06](#))
- 295/125 . . . with the ring nitrogen atoms and the substituent nitrogen atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/13 to an acyclic saturated chain
- 295/135 . . . with the ring nitrogen atoms and the substituent nitrogen atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/14 . . substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 295/145 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms attached to the same carbon chain, which is not interrupted by carbocyclic rings
- 295/15 to an acyclic saturated chain
- 295/155 . . . with the ring nitrogen atoms and the carbon atoms with three bonds to hetero atoms separated by carbocyclic rings or by carbon chains interrupted by carbocyclic rings
- 295/16 . acylated on ring nitrogen atoms
- 295/18 . . by radicals derived from carboxylic acids, or sulfur or nitrogen analogues thereof
- 295/182 . . . Radicals derived from carboxylic acids
- 295/185 from aliphatic carboxylic acids
- 295/192 from aromatic carboxylic acids
- 295/194 . . . Radicals derived from thio- or thiono carboxylic acids
- 295/195 . . . Radicals derived from nitrogen analogues of carboxylic acids
- 295/20 . . by radicals derived from carbonic acid, or sulfur or nitrogen analogues thereof
- 295/205 . . . Radicals derived from carbonic acid
- 295/21 . . . Radicals derived from sulfur analogues of carbonic acid
- 295/215 . . . Radicals derived from nitrogen analogues of carbonic acid
- 295/22 . with hetero atoms directly attached to ring nitrogen atoms
- 295/24 . . Oxygen atoms
- 295/26 . . Sulfur atoms
- 295/28 . . Nitrogen atoms
- 295/30 . . . non-acylated
- 295/32 . . . acylated with carboxylic or carbonic acids, or their nitrogen or sulfur analogues
- Heterocyclic compounds having oxygen atoms with or without sulfur, selenium or tellurium, as ring hetero atoms**
- 301/00 Preparation of oxiranes**
- 301/02 . Synthesis of the oxirane ring
- 301/03 . . by oxidation of unsaturated compounds, or of mixtures of unsaturated and saturated compounds
- 301/04 . . . with air or molecular oxygen
- 301/06 in the liquid phase
- 301/08 in the gaseous phase
- 301/10 with catalysts containing silver or gold
- 301/12 . . . with hydrogen peroxide or inorganic peroxides or peracids
- 301/14 . . . with organic peracids, or salts, anhydrides or esters thereof
- 301/16 formed *in situ*, e.g. from carboxylic acids and hydrogen peroxide
- 301/18 from polybasic carboxylic acids
- 301/19 . . . with organic hydroperoxides
- 301/22 . . by oxidation of the saturated compounds with air or molecular oxygen ([of mixtures of unsaturated compounds C07D 301/04](#))

- 301/24 . . . by splitting off HAL—Y from compounds containing the radical HAL—C—C—OY
- 301/26 . . . Y being hydrogen
- 301/27 . . . Condensation of epihalohydrins or halohydrins with compounds containing active hydrogen atoms ([macromolecular compounds C08](#))
- 301/28 . . . by reaction with hydroxyl radicals
- 301/30 . . . by reaction with carboxyl radicals
- 301/32 . . . Separation; Purification
- 301/36 . . . Use of additives, e.g. for stabilisation
- 303/00 Compounds containing three-membered rings having one oxygen atom as the only ring heteroatom**
- 303/02 . . . Compounds containing oxirane rings
- 303/04 . . . containing only hydrogen and carbon atoms in addition to the ring oxygen atoms
- 303/06 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- 303/08 . . . with hydrocarbon radicals, substituted by halogen atoms, nitro radicals or nitroso radicals
- 303/10 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings ([steroids C07J](#))
- 303/12 . . . with hydrocarbon radicals substituted by singly or doubly bound oxygen atoms
- 303/14 . . . by free hydroxyl radicals
- 303/16 . . . by esterified hydroxyl radicals
- 303/17 . . . containing oxirane rings condensed with carbocyclic ring systems having three or more relevant rings
- 303/18 . . . by etherified hydroxyl radicals
- 303/20 . . . Ethers with hydroxy compounds containing no oxirane rings
- 303/22 . . . with monohydroxy compounds
- 303/23 . . . Oxiranylmethyl ethers of compounds having one hydroxy group bound to a six-membered aromatic ring, the oxiranylmethyl radical not being further substituted, i.e.
- $$\begin{array}{c} \text{CH}_2-\text{CH}-\text{CH}_2-\text{O}-\text{Aryl} \\ \diagup \quad \diagdown \\ \text{O} \end{array}$$
- 303/24 . . . with polyhydroxy compounds
- 303/26 . . . having one or more free hydroxyl radicals
- 303/27 . . . having all hydroxyl radicals etherified with oxirane containing compounds
- 303/28 . . . Ethers with hydroxy compounds containing oxirane rings
- 303/30 . . . Ethers of oxirane-containing polyhydroxy compounds in which all hydroxyl radicals are etherified with oxirane-containing hydroxy compounds
- 303/31 . . . in which the oxirane rings are condensed with a carbocyclic ring system having three or more relevant rings
- 303/32 . . . by aldehydo- or ketonic radicals
- 303/34 . . . with hydrocarbon radicals substituted by sulfur, selenium or tellurium atoms
- 303/36 . . . with hydrocarbon radicals substituted by nitrogen atoms ([nitro, nitroso radicals C07D.303/08](#))
- 303/38 . . . with hydrocarbon radicals substituted by carbon atoms having three bonds to heteroatoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 303/40 . . . by ester radicals
- 303/42 . . . Acyclic compounds having a chain of seven or more carbon atoms, e.g. epoxidised fats
- 303/44 . . . Esterified with oxirane-containing hydroxy compounds
- 303/46 . . . by amide or nitrile radicals
- 303/48 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms; with at the most one bond to halogen, directly attached to ring carbon atoms, e.g. ester or nitrile radicals
- 305/00 Heterocyclic compounds containing four-membered rings having one oxygen atoms as the only ring hetero atoms**
- 305/02 . . . not condensed with other rings
- 305/04 . . . having no double bonds between ring members or between ring members and non-ring members
- 305/06 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring atoms
- 305/08 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring atoms
- 305/10 . . . having one or more double bonds between ring members or between ring members and non-ring members
- 305/12 . . . Beta-lactones
- 305/14 . . . condensed with carbocyclic rings or ring systems
- 307/00 Heterocyclic compounds containing five-membered rings having one oxygen atom as the only ring hetero atom**
- 307/02 . . . not condensed with other rings
- 307/04 . . . having no double bonds between ring members or between ring members and non-ring members
- 307/06 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 307/08 . . . Preparation of tetrahydrofuran
- 307/10 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 307/12 . . . Radicals substituted by oxygen atoms
- 307/14 . . . Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 307/16 . . . Radicals substituted by carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals
- 307/18 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 307/20 . . . Oxygen atoms
- 307/22 . . . Nitrogen atoms not forming part of a nitro radical
- 307/24 . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 307/26 . . . having one double bond between ring members or between a ring member and a non-ring member

- 307/28 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 307/30 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 307/32 Oxygen atoms
- 307/33 in position 2, the oxygen atom being in its keto or unsubstituted enol form
- 307/34 . . having two or three double bonds between ring members or between ring members and non-ring members
- 307/36 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 307/38 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 307/40 Radicals substituted by oxygen atoms
- 307/42 Singly bound oxygen atoms ([two oxygen atoms bound to the same carbon atom C07D 307/46](#))
- 307/44 Furfuryl alcohol
- 307/45 Oxygen atoms acylated by a cyclopropane containing carboxylic acyl radical, e.g. chrysanthemumates
- 307/46 Doubly bound oxygen atoms, or two oxygen atoms singly bound to the same carbon atom
- 307/48 Furfural
- 307/50 Preparation from natural products
- 307/52 Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 307/54 Radicals substituted by carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals
- 307/56 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 307/58 One oxygen atom, e.g. butenolide
- 307/60 Two oxygen atoms, e.g. succinic anhydride
- 307/62 Three oxygen atoms, e.g. ascorbic acid
- 307/64 Sulfur atoms
- 307/66 Nitrogen atoms ([nitro radicals C07D 307/70](#))
- 307/68 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 307/70 Nitro radicals
- 307/71 attached in position 5
- 307/72 with hydrocarbon radicals, substituted by nitrogen-containing radicals, attached in position 2
- 307/73 by amino or imino, or substituted amino or imino radicals
- 307/74 by hydrazino or hydrazono or such substituted radicals
- 307/75 having carboxylic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. hydrazides
- 307/76 having carbonic acyl radicals or their thio or nitrogen analogues directly attached to the hydrazino or hydrazono radical, e.g. semicarbazides
- 307/77 ortho- or peri-condensed with carbocyclic rings or ring systems
- 307/78 . . Benzo [b] furans; Hydrogenated benzo [b] furans
- 307/79 . . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals directly attached to carbon atoms of the hetero ring
- 307/80 Radicals substituted by oxygen atoms
- 307/81 Radicals substituted by nitrogen atoms not forming part of a nitro radical
- 307/82 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the hetero ring
- 307/83 Oxygen atoms
- 307/84 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 307/85 attached in position 2
- 307/86 . . . with an oxygen atom directly attached in position 7
- 307/87 . . Benzo [c] furans; Hydrogenated benzo [c] furans
- 307/88 . . . with one oxygen atom directly attached in position 1 or 3
- 307/885 3,3-Diphenylphthalides
- 307/89 . . . with two oxygen atoms directly attached in positions 1 and 3
- 307/90 . . . with an oxygen atom in position 1 and a nitrogen atom in position 3, or *vice versa*
- 307/91 . . Dibenzofurans; Hydrogenated dibenzofurans
- 307/92 . . Naphthofurans; Hydrogenated naphthofurans
- 307/93 . . condensed with a ring other than six-membered
- 307/935 . . . Not further condensed cyclopenta [b] furans or hydrogenated cyclopenta [b] furans
- 307/937 with hydrocarbon or substituted hydrocarbon radicals directly attached in position 2, e.g. prostacyclins
- 307/94 . . spiro-condensed with carbocyclic rings or ring systems, e.g. griseofulvins
- 309/00 Heterocyclic compounds containing six-membered rings having one oxygen atom as the only ring hetero atom, not condensed with other rings**
- 309/02 . . having no double bonds between ring members or between ring members and non-ring members
- 309/04 . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to ring carbon atoms
- 309/06 . . . Radicals substituted by oxygen atoms
- 309/08 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 309/10 . . . Oxygen atoms
- 309/12 only hydrogen atoms and one oxygen atom directly attached to ring carbon atoms, e.g. tetrahydropyranil ethers
- 309/14 . . . Nitrogen atoms not forming part of a nitro radical ([nitro radical C07D 309/08](#))
- 309/16 . . having one double bond between ring members or between a ring member and a non-ring member

309/18	. . containing only hydrogen and carbon atoms in addition to the ring hetero atom	311/40	. . . . . Separation, e.g. from natural material; Purification
309/20	. . with hydrogen atoms and substituted hydrocarbon radicals directly attached to ring carbon atoms	311/42	. . . with oxygen or sulfur atoms in positions 2 and 4
309/22	. . . Radicals substituted by oxygen atoms	311/44	. . . . with one hydrogen atom in position 3
309/24	. . . . Methylol radicals	311/46	. . . . . unsubstituted in the carbocyclic ring
309/26	. . . . Carboxaldehyde radicals	311/48	. . . . . with two such benzopyran radicals linked together by a carbon chain
309/28	. . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	311/50	. . . . . with elements other than carbon and hydrogen in position 3
309/30	. . . Oxygen atoms, e.g. delta-lactones	311/52	. . . . . Enol-esters or -ethers, or sulfur analogues thereof
309/32	. having two double bonds between ring members or between ring members and non-ring members	311/54	. . . . . substituted in the carbocyclic ring
309/34	. having three or more double bonds between ring members or between ring members and non-ring members	311/56	. . . . without hydrogen atoms in position 3
309/36	. . with oxygen atoms directly attached to ring carbon atoms	311/58	. . . other than with oxygen or sulfur atoms in positions 2 or 4
309/38	. . . one oxygen atom in position 2 or 4, e.g. pyrones	311/60	. . . . with aryl radicals attached in position 2
309/40	. . . Oxygen atoms attached in positions 3 and 4, e.g. maltol	311/62	. . . . . with oxygen atoms directly attached in position 3, e.g. anthocyanidins
311/00	Heterocyclic compounds containing six-membered rings having one oxygen atom as the only hetero atom, condensed with other rings	311/64	. . . . with oxygen atoms directly attached in position 8
311/02	. ortho- or peri-condensed with carbocyclic rings or ring systems	311/66	. . . . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2
311/04	. . Benzo[b]pyrans, not hydrogenated in the carbocyclic ring	311/68	. . . . with nitrogen atoms directly attached in position 4
311/06	. . . with oxygen or sulfur atoms directly attached in position 2	311/70	. . . . with two hydrocarbon radicals attached in position 2 and elements other than carbon and hydrogen in position 6
311/08	. . . . not hydrogenated in the hetero ring	311/72	. . . . . 3,4-Dihydro-derivatives having in position 2 at least one methyl radical and in position 6 an oxygen atom, e.g. tocopherols
311/10	. . . . . unsubstituted	311/74	. . Benzo[b]pyrans, hydrogenated in the carbocyclic ring
311/12	. . . . . substituted in position 3 and unsubstituted in position 7	311/76	. . Benzo[c]pyrans
311/14	. . . . . substituted in position 6 and unsubstituted in position 7	311/78	. . Ring systems having three or more relevant rings
311/16	. . . . . substituted in position 7	311/80	. . . Dibenzopyrans; Hydrogenated dibenzopyrans
311/18	. . . . . substituted otherwise than in position 3 or 7 (substituted in position 4 by oxygen or sulfur C07D 311/42)	311/82	. . . . Xanthenes
311/20	. . . . hydrogenated in the hetero ring	311/84	. . . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 9
311/22	. . . with oxygen or sulfur atoms directly attached in position 4	311/86	. . . . . Oxygen atoms, e.g. xanthenes
311/24	. . . . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 2	311/88	. . . . . Nitrogen atoms
311/26	. . . . with aromatic rings attached in position 2 or 3	311/90	. . . . . with hydrocarbon radicals substituted by amino radicals, directly attached in position 9
311/28	. . . . . with aromatic rings attached in position 2 only	311/92	. . . Naphthopyrans; Hydrogenated naphthopyrans
311/30	. . . . . not hydrogenated in the hetero ring, e.g. flavones	311/94	. . condensed with rings other than six-membered
311/32	. . . . . 2,3-Dihydro derivatives, e.g. flavanones	311/96	. spiro-condensed with carbocyclic rings or ring systems
311/34	. . . . . with aromatic rings attached in position 3 only	313/00	Heterocyclic compounds containing rings of more than six members having one oxygen atom as the only ring hetero atom
311/36	. . . . . not hydrogenated in the hetero ring, e.g. isoflavones	313/02	. Seven-membered rings
311/38	. . . . . 2,3-Dihydro derivated, e.g. isoflavanones	313/04	. . not condensed with other rings
		313/06	. . condensed with carbocyclic rings or ring systems
		313/08	. . . condensed with one six-membered ring
		313/10	. . . condensed with two six-membered rings
		313/12	. . . . [b,e]-condensed

- 313/14 [b,f]-condensed
- 313/16 . Eight-membered rings
- 313/18 . . not condensed with other rings
- 313/20 . . condensed with carbocyclic rings or ring systems
- 315/00 Heterocyclic compounds containing rings having one oxygen atom as the only ring hetero atom according to more than one of groups [C07D 303/00](#) - [C07D 313/00](#)**
- 317/00 Heterocyclic compounds containing five-membered rings having two oxygen atoms as the only ring hetero atoms**
- 317/02 . having the hetero atoms in positions 1 and 2
- 317/04 . . not condensed with other rings
- 317/06 . . condensed with carbocyclic rings or ring systems
- 317/08 . having the hetero atoms in positions 1 and 3
- 317/10 . . not condensed with other rings
- 317/12 . . . with only hydrogen atoms or radicals containing only hydrogen and carbon atoms, directly attached to ring carbon atoms
- 317/14 . . . with substituted hydrocarbon radicals attached to ring carbon atoms
- 317/16 . . . Radicals substituted by halogen atoms or nitro radicals
- 317/18 . . . Radicals substituted by singly bound oxygen or sulfur atoms
- 317/20 Free hydroxyl or mercaptan
- 317/22 etherified
- 317/24 esterified
- 317/26 . . . Radicals substituted by doubly bound oxygen or sulfur atoms or by two such atoms singly bound to the same carbon atom
- 317/28 . . . Radicals substituted by nitrogen atoms (by [nitro radicals C07D 317/16](#))
- 317/30 . . . Radicals substituted by carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals
- 317/32 . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms
- 317/34 Oxygen atoms
- 317/36 Alkylene carbonates; Substituted alkylene carbonates
- 317/38 Ethylene carbonate
- 317/40 Vinylene carbonate; Substituted vinylene carbonates
- 317/42 Halogen atoms or nitro radicals
- 317/44 . . ortho- or peri-condensed with carbocyclic rings or ring systems
- 317/46 . . . condensed with one six-membered ring
- 317/48 Methyleneedioxybenzenes or hydrogenated methyleneedioxybenzenes unsubstituted on the hetero ring
- 317/50 with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to atoms of the carbocyclic ring
- 317/52 Radicals substituted by halogen atoms or nitro radicals
- 317/54 Radicals substituted by oxygen atoms
- 317/56 Radicals substituted by sulfur atoms
- 317/58 Radicals substituted by nitrogen atoms (by [nitro radicals C07D 317/52](#))
- 317/60 Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
- 317/62 with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to atoms of the carbocyclic ring
- 317/64 Oxygen atoms
- 317/66 Nitrogen atoms not forming part of a nitro radical
- 317/68 Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 317/70 . . . condensed with ring systems containing two or more relevant rings
- 317/72 . . . spiro-condensed with carbocyclic rings
- 319/00 Heterocyclic compounds containing six-membered rings having two oxygen atoms as the only ring hetero atoms**
- 319/02 . 1,2-Dioxanes; Hydrogenated 1,2-dioxanes
- 319/04 . 1,3-Dioxanes; Hydrogenated 1,3-dioxanes
- 319/06 . . not condensed with other rings
- 319/08 . . condensed with carbocyclic rings or ring systems
- 319/10 . 1,4-Dioxanes; Hydrogenated 1,4-dioxanes
- 319/12 . . not condensed with other rings
- 319/14 . . condensed with carbocyclic rings or ring systems
- 319/16 . . . condensed with one six-membered ring
- 319/18 Ethylenedioxybenzenes, not substituted on the hetero ring
- 319/20 with substituents attached to the hetero ring
- 319/22 . . . condensed with one naphthalene or hydrogenated naphthalene ring system
- 319/24 . . . [b,e]-condensed with two six-membered rings
- 321/00 Heterocyclic compounds containing rings having two oxygen atoms as the only ring hetero atoms, not provided for by groups [C07D 317/00](#) - [C07D 319/00](#)**
- 321/02 . Seven-membered rings
- 321/04 . . not condensed with other rings
- 321/06 . . . 1,3-Dioxepines; Hydrogenated 1,3-dioxepines
- 321/08 . . . 1,4-Dioxepines; Hydrogenated 1,4-dioxepines
- 321/10 . . condensed with carbocyclic rings or ring systems
- 321/12 . Eight-membered rings
- 323/00 Heterocyclic compounds containing more than two oxygen atoms as the only ring hetero atoms**
- 323/02 . Five-membered rings
- 323/04 . Six-membered rings
- 323/06 . . Trioxane
- 325/00 Heterocyclic compounds containing rings having oxygen as the only ring hetero atoms according to more than one of the main groups [C07D 303/00](#) - [C07D 323/00](#)**
- 327/00 Heterocyclic compounds containing rings having oxygen and sulfur atoms as the only ring hetero atoms**
- 327/02 . one oxygen atom and one sulfur atom
- 327/04 . . Five-membered rings
- 327/06 . . Six-membered rings

327/08	. . . [b,e]-condensed with two six-membered carbocyclic rings	333/52	. . Benzo[b]thiophenes; Hydrogenated benzo[b]thiophenes
327/10	. two oxygen atoms and one sulfur atom, e.g. cyclic sulfates	333/54	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to carbon atoms of the hetero ring
329/00	Heterocyclic compounds containing rings having oxygen and selenium or oxygen and tellurium atoms as the only ring hetero atoms	333/56	. . . . Radicals substituted by oxygen atoms
		333/58	. . . . Radicals substituted by nitrogen atoms
		333/60	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals
Heterocyclic compounds having sulfur, selenium or tellurium as the only ring hetero atoms			
331/00	Heterocyclic compounds containing rings of less than five members, having one sulfur atom as the only ring hetero atom	333/62	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to carbon atoms of the hetero ring
331/02	. Three-membered rings	333/64	. . . . Oxygen atoms
331/04	. Four-membered rings	333/66	. . . . Nitrogen atoms not forming part of a nitro radical
333/00	Heterocyclic compounds containing five-membered rings having one sulfur atom as the only ring hetero atom	333/68	. . . . Carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
333/02	. not condensed with other rings	333/70	. . . . . attached in position 2
333/04	. . not substituted on the ring sulfur	333/72	. . Benzo[c]thiophenes; Hydrogenated benzo[c]thiophenes
333/06	. . . with only hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached to the ring carbon atoms	333/74	. . Naphthothiophenes
333/08	. . . . Hydrogen atoms or radicals containing only hydrogen and carbon atoms	333/76	. . Dibenzothiophenes
333/10	. . . . . Thiophene	333/78	. . condensed with rings other than six-membered or with ring systems containing such rings
333/12	. . . . Radicals substituted by halogen atoms or nitro or nitroso radicals	333/80	. . . Seven-membered rings
333/14	. . . . Radicals substituted by singly bound hetero atoms other than halogen	335/00	Heterocyclic compounds containing six-membered rings having one sulfur atom as the only ring hetero atom
333/16	. . . . . by oxygen atoms	335/02	. not condensed with other rings
333/18	. . . . . by sulfur atoms	335/04	. condensed with carbocyclic rings or ring systems
333/20	. . . . . by nitrogen atoms (nitro, nitroso radicals C07D 333/12)	335/06	. . Benzothioapyrans; Hydrogenated benzothioapyrans
333/22	. . . . Radicals substituted by doubly bound hetero atoms, or by two hetero atoms other than halogen singly bound to the same carbon atom	335/08	. . Naphthothioapyrans; Hydrogenated naphthothioapyrans
333/24	. . . . Radicals substituted by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals	335/10	. . Dibenzothioapyrans; Hydrogenated dibenzothioapyrans
333/26	. . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached to ring carbon atoms	335/12	. . . Thioxanthenes
333/28	. . . . Halogen atoms	335/14	. . . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 9
333/30	. . . . Hetero atoms other than halogen	335/16	. . . . . Oxygen atoms, e.g. thioxanthenes
333/32	. . . . . Oxygen atoms	335/18	. . . . . Nitrogen atoms
333/34	. . . . . Sulfur atoms	335/20	. . . . with hydrocarbon radicals, substituted by amino radicals, directly attached in position 9
333/36	. . . . . Nitrogen atoms (nitro, nitroso radicals C07D 333/42)	337/00	Heterocyclic compounds containing rings of more than six members having one sulfur atom as the only ring hetero atom
333/38	. . . . Carbon atoms having three bonds to hetero atoms, with at the most one bond to halogen, e.g. ester or nitrile radicals	337/02	. Seven-membered rings
333/40	. . . . . Thiophene-2-carboxylic acid [2]	337/04	. . not condensed with other rings
333/42	. . . . with nitro or nitroso radicals directly attached to ring carbon atoms	337/06	. . condensed with carbocyclic rings or ring systems
333/44	. . . . . attached in position 5	337/08	. . . condensed with one six-membered ring
333/46	. . substituted on the ring sulfur atom	337/10	. . . condensed with two six-membered rings
333/48	. . . by oxygen atoms	337/12	. . . . [b,e]-condensed
333/50	. condensed with carbocyclic rings or ring systems	337/14	. . . . [b,f]-condensed
		337/16	. Eight-membered rings
		339/00	Heterocyclic compounds containing rings having two sulfur atoms as the only ring hetero atoms
		339/02	. Five-membered rings

339/04	. . having the hetero atoms in position 1,2, e.g. lipoic acid	405/00	Heterocyclic compounds containing both one or more hetero rings having oxygen atoms as the only ring hetero atoms, and one or more rings having nitrogen as the only ring hetero atom
339/06	. . having the hetero atoms in position 1,3, e.g. cyclic dithiocarbonates	405/02	. containing two hetero rings
339/08	. Six-membered rings	405/04	. . directly linked by a ring-member-to-ring-member bond
341/00	Heterocyclic compounds containing rings having three or more sulfur atoms as the only ring hetero atoms	405/06	. . linked by a carbon chain containing only aliphatic carbon atoms
343/00	Heterocyclic compounds containing rings having sulfur and selenium or sulfur and tellurium atoms as the only ring hetero atoms	405/08	. . linked by a carbon chain containing alicyclic rings
345/00	Heterocyclic compounds containing rings having selenium or tellurium atoms as the only ring hetero atoms	405/10	. . linked by a carbon chain containing aromatic rings
347/00	Heterocyclic compounds containing rings having halogen atoms as ring hetero atoms	405/12	. . linked by a chain containing hetero atoms as chain links
		405/14	. containing three or more hetero rings
		407/00	Heterocyclic compounds containing two or more hetero rings, at least one ring having oxygen atoms as the only ring hetero atoms, not provided for by group C07D 405/00
<u>Heterocyclic compounds containing two or more hetero rings</u>			
401/00	Heterocyclic compounds containing two or more hetero rings, having nitrogen atoms as the only ring hetero atoms, at least one ring being a six-membered ring with only one nitrogen atom	407/02	. containing two hetero rings
	NOTE	407/04	. . directly linked by a ring-member-to-ring-member bond
	Groups C07D 401/00-C07D 421/00 cover compounds containing two or more relevant hetero rings at least two of which are covered by different main groups of groups C07D 203/00-C07D 347/00 , neither condensed among themselves nor condensed with a common carbocyclic ring or ring system.	407/06	. . linked by a carbon chain containing only aliphatic carbon atoms
401/02	. containing two hetero rings	407/08	. . linked by a carbon chain containing alicyclic rings
401/04	. . directly linked by a ring-member-to-ring-member bond	407/10	. . linked by a carbon chain containing aromatic rings
401/06	. . linked by a carbon chain containing only aliphatic carbon atoms	407/12	. . linked by a chain containing hetero atoms as chain links
401/08	. . linked by a carbon chain containing alicyclic rings	407/14	. containing three or more hetero rings
401/10	. . linked by a carbon chain containing aromatic rings	409/00	Heterocyclic compounds containing two or more hetero rings, at least one ring having sulfur atoms as the only ring hetero atoms
401/12	. . linked by a chain containing hetero atoms as chain links	409/02	. containing two hetero rings
401/14	. containing three or more hetero rings	409/04	. . directly linked by a ring-member-to-ring-member bond
403/00	Heterocyclic compounds containing two or more hetero rings, having nitrogen atoms as the only ring hetero atoms, not provided for by group C07D 401/00	409/06	. . linked by a carbon chain containing only aliphatic carbon atoms
403/02	. containing two hetero rings	409/08	. . linked by a carbon chain containing alicyclic rings
403/04	. . directly linked by a ring-member-to-ring-member bond	409/10	. . linked by a carbon chain containing aromatic rings
403/06	. . linked by a carbon chain containing only aliphatic carbon atoms	409/12	. . linked by a chain containing hetero atoms as chain links
403/08	. . linked by a carbon chain containing alicyclic rings	409/14	. containing three or more hetero rings
403/10	. . linked by a carbon chain containing aromatic rings	411/00	Heterocyclic compounds containing two or more hetero rings, at least one ring having oxygen and sulfur atoms as the only ring hetero atoms
403/12	. . linked by a chain containing hetero atoms as chain links	411/02	. containing two hetero rings
403/14	. containing three or more hetero rings	411/04	. . directly linked by a ring-member-to-ring-member bond
		411/06	. . linked by a carbon chain containing only aliphatic carbon atoms
		411/08	. . linked by a carbon chain containing alicyclic rings
		411/10	. . linked by a carbon chain containing aromatic rings
		411/12	. . linked by a chain containing hetero atoms as chain links
		411/14	. containing three or more hetero rings

413/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen and oxygen atoms as the only ring hetero atoms

- 413/02 . containing two hetero rings
- 413/04 . . directly linked by a ring-member-to-ring-member bond
- 413/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 413/08 . . linked by a carbon chain containing alicyclic rings
- 413/10 . . linked by a carbon chain containing aromatic rings
- 413/12 . . linked by a chain containing hetero atoms as chain links
- 413/14 . containing three or more hetero rings

415/00 Heterocyclic compounds containing the thiamine skeleton**417/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen and sulfur atoms as the only ring hetero atoms, not provided for by group C07D 415/00**

- 417/02 . containing two hetero rings
- 417/04 . . directly linked by a ring-member-to-ring-member bond
- 417/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 417/08 . . linked by a carbon chain containing alicyclic rings
- 417/10 . . linked by a carbon chain containing aromatic rings
- 417/12 . . linked by a chain containing hetero atoms as chain links
- 417/14 . containing three or more hetero rings

419/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having nitrogen, oxygen, and sulfur atoms as the only ring hetero atoms

- 419/02 . containing two hetero rings
- 419/04 . . directly linked by a ring-member-to-ring-member bond
- 419/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 419/08 . . linked by a carbon chain containing alicyclic rings
- 419/10 . . linked by a carbon chain containing aromatic rings
- 419/12 . . linked by a chain containing hetero atoms as chain links
- 419/14 . containing three or more hetero rings

421/00 Heterocyclic compounds containing two or more hetero rings, at least one ring having selenium, tellurium, or halogen atoms as ring hetero atoms

- 421/02 . containing two hetero rings
- 421/04 . . directly linked by a ring-member-to-ring-member bond
- 421/06 . . linked by a carbon chain containing only aliphatic carbon atoms
- 421/08 . . linked by a carbon chain containing alicyclic rings
- 421/10 . . linked by a carbon chain containing aromatic rings

- 421/12 . . linked by a chain containing hetero atoms as chain links
- 421/14 . containing three or more hetero rings

Heterocyclic compounds containing condensed hetero ring systems**NOTES**

1. [C07D 451/00](#) - [C07D 517/00](#) cover compounds containing one system of two or more relevant hetero rings condensed among themselves or condensed with a common carbocyclic ring system, with or without other non- condensed hetero rings.
2. For the purpose of classification in groups [C07D 451/00](#) - [C07D 519/00](#), the degree of hydrogenation of the ring system is not taken into consideration.
3. For the purpose of classification in groups [C07D 451/00](#) - [C07D 463/00](#), [C07D 473/00](#) - [C07D 477/00](#), [C07D 489/00](#), [C07D 499/00](#) - [C07D 507/00](#), the wording of the groups has to be understood, in the absence of an indication to the contrary, as including ring systems further condensed with carbocyclic rings or ring systems, but excluding ring systems further condensed with other hetero rings, either directly or through a common carbocyclic ring system, e.g. sparteine is classified in group [C07D 471/22](#), not in group [C07D 455/02](#).
4. In groups [C07D 471/00](#), [C07D 487/00](#), [C07D 491/00](#) - [C07D 498/00](#) or [C07D 513/00](#) - [C07D 517/00](#), the subdivision is based on the number of relevant hetero rings.

451/00 Heterocyclic compounds containing 8-azabicyclo [3.2.1] octane, 9-azabicyclo [3.3.1] nonane, or 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring systems, e.g. tropane or granatane alkaloids, scopolamine; Cyclic acetals thereof

- 451/02 . containing not further condensed 8-azabicyclo [3.2.1] octane or 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring systems, e.g. tropane; Cyclic acetals thereof
- 451/04 . . with hetero atoms directly attached in position 3 of the 8-azabicyclo [3.2.1] octane or in position 7 of the 3-oxa-9-azatricyclo [3.3.1.0<2,4>] nonane ring system
 - 451/06 . . . Oxygen atoms
 - 451/08 Diarylmethoxy radicals
 - 451/10 acylated by aliphatic or araliphatic carboxylic acids, e.g. atropine, scopolamine
 - 451/12 acylated by aromatic or heteroaromatic carboxylic acids, e.g. cocaine
- 451/14 . containing 9-azabicyclo [3.3.1] nonane ring systems, e.g. granatane, 2-aza-adamantane; Cyclic acetals thereof

453/00 Heterocyclic compounds containing quinuclidine or iso-quinuclidine ring systems, e.g. quinine alkaloids

- 453/02 . containing not further condensed quinuclidine ring systems
- 453/04 . . having a quinolyl-4, a substituted quinolyl-4 or a alkylendioxy-quinolyl-4 radical linked through only one carbon atom, attached in position 2, e.g. quinine
- 453/06 . containing isoquinuclidine ring systems

455/00 Heterocyclic compounds containing quinolizine ring systems, e.g. emetine alkaloids, protoberberine; Alkylendioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine

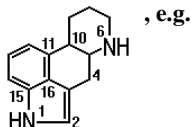
- 455/02 . containing not further condensed quinolizine ring systems
- 455/03 . containing quinolizine ring systems directly condensed with at least one six-membered carbocyclic ring, e.g. protoberberine; Alkylendioxy derivatives of dibenzo [a, g] quinolizines, e.g. berberine

WARNING

Group [C07D 455/03](#) is temporarily incomplete. See provisionally also other CPC subgroups of [C07D 455/00](#)

- 455/04 . . containing a quinolizine ring system condensed with only one six-membered carbocyclic ring, e.g. julolidine
- 455/06 . . . containing benzo [a] quinolizine ring systems
- 455/08 having an isoquinolyl-1, a substituted isoquinolyl-1 or an alkylendioxyisoquinolyl-1 radical linked through only one carbon atom, attached in position 2, e.g. emetine

457/00 Heterocyclic compounds containing indolo [4, 3-f, g] quinoline ring systems, e.g. derivatives of ergoline, of the formula:



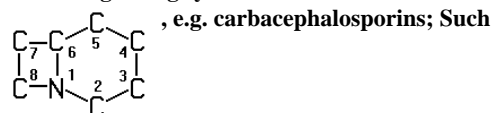
lysergic acid (compounds of the cyclic peptide type derived from ergotamine [C07D 519/02](#))

- 457/02 . with hydrocarbon or substituted hydrocarbon radicals, attached in position 8
- 457/04 . with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, directly attached in position 8
- 457/06 . . Lysergic acid amides
- 457/08 . . . in which the amide nitrogen is a member of a heterocyclic ring
- 457/10 . with hetero atoms directly attached in position 8
- 457/12 . . Nitrogen atoms
- 457/14 . containing indolo [4, 3-f, g] quinoline ring systems condensed with carbocyclic rings or ring systems

459/00 Heterocyclic compounds containing benz [g] indolo [2, 3-a] quinolizine ring systems, e.g. yohimbine; 16, 18-lactones thereof, e.g. reserpine lactone

461/00 Heterocyclic compounds containing indolo [3,2,1-d,e] pyrido [3,2,1,j] [1,5]-naphthyridine ring systems, e.g. vincamine (dimeric indolo alkaloids [C07D 519/04](#))

463/00 Heterocyclic compounds containing 1-azabicyclo [4.2.0] octane ring systems, i.e. compounds containing a ring system of the formula:



, e.g. carbacephalosporins; Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring

WARNING

The IPC subgroups of [C07D 463/00](#), introduced in the CPC scheme in October 2007, might be temporarily incomplete as a number of documents presently classified in CPC subgroups of [C07D 463/00](#) still needs reclassification to these IPC subgroups

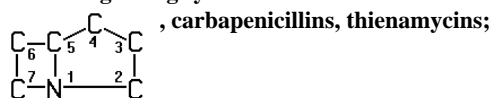
- 463/02 . Preparation (by microbiological processes [C12P 17/18](#))
- 463/04 . . by forming the ring or condensed ring systems
- 463/06 . . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 463/08 Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 463/10 . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 463/12 . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals attached in position 7
- 463/14 . . . with hetero atoms directly attached in position 7
- 463/16 Nitrogen atoms
- 463/18 further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof
- 463/20 with the acylating radicals further substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 463/22 further substituted by nitrogen atoms
- 471/00 Heterocyclic compounds containing nitrogen atoms as the only ring hetero atoms in the condensed system, at least one ring being a six-membered ring with one nitrogen atom, not provided for by groups [C07D 451/00](#) - [C07D 463/00](#)**
- 471/02 . in which the condensed system contains two hetero rings
- 471/04 . . Ortho-condensed systems (carbacephalosporins [C07D 463/00](#))
- 471/06 . . Peri-condensed systems
- 471/08 . . Bridged systems
- 471/10 . . Spiro-condensed systems
- 471/12 . in which the condensed system contains three hetero rings
- 471/14 . . Ortho-condensed systems
- 471/16 . . Peri-condensed systems
- 471/18 . . Bridged systems
- 471/20 . . Spiro-condensed systems
- 471/22 . in which the condensed systems contains four or more hetero rings

473/00 Heterocyclic compounds containing purine ring systems

- 473/02 . with oxygen, sulfur or nitrogen atoms directly attached in positions 2 and 6
- 473/04 . . two oxygen atoms
- 473/06 . . . with radicals containing only hydrogen and carbon atoms, attached in position 1 or 3
- 473/08 with methyl radicals in positions 1 and 3, e.g. theophylline
- 473/10 with methyl radicals in positions 3 and 7, e.g. theobromine
- 473/12 with methyl radicals in positions 1, 3 and 7, e.g. caffeine
- 473/14 with two methyl radicals in positions 1 and 3 and two methyl radicals in positions 7, 8 or 9
- 473/16 . . two nitrogen atoms
- 473/18 . . one oxygen and one nitrogen atom, e.g. guanine
- 473/20 . . two sulfur atoms
- 473/22 . . one oxygen and one sulfur atom
- 473/24 . . one nitrogen and one sulfur atom
- 473/26 . with an oxygen, sulfur or nitrogen atom directly attached in position 2 or 6, but not in both
- 473/28 . . Oxygen atom
- 473/30 . . . attached in position 6, e.g. hypoxanthine
- 473/32 . . Nitrogen atom
- 473/34 . . . attached in position 6, e.g. adenine
- 473/36 . . Sulfur atom
- 473/38 . . . attached in position 6
- 473/40 . with halogen atoms or perhalogeno-alkyl radicals directly attached in positions 2 or 6

475/00 Heterocyclic compounds containing pteridine ring systems

- 475/02 . with an oxygen atom directly attached in position 4
- 475/04 . . with a nitrogen atom directly attached in position 2
- 475/06 . with a nitrogen atom directly attached in position 4
- 475/08 . . with a nitrogen atom directly attached in position 2
- 475/10 . . with an aromatic or hetero-aromatic ring directly attached in position 2
- 475/12 . containing pteridine ring systems condensed with carbocyclic rings or ring systems
- 475/14 . . Benz [g] pteridines, e.g. riboflavin

477/00 Heterocyclic compounds containing 1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:

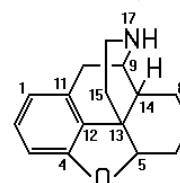
Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring

- 477/02 . Preparation (by microbiological processes [C12P 17/18](#))
- 477/04 . . by forming the ring or condensed ring systems
- 477/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 477/08 . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification

- 477/10 . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, directly attached in position 4 and with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 477/12 . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached in position 6
- 477/14 . . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, attached in position 3
- 477/16 . . . with hetero atoms or carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 3
- 477/18 Oxygen atoms
- 477/20 Sulfur atoms
- 477/22 Nitrogen atoms
- 477/24 . . with hetero atoms or carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 6
- 477/26 . with hetero atoms or carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 4

487/00 Heterocyclic compounds containing nitrogen atoms as the only ring hetero atoms in the condensed system, not provided for by [C07D 451/00](#) - [C07D 477/00](#)

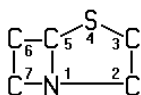
- 487/02 . in which the condensed system contains two hetero rings
- 487/04 . . Ortho-condensed systems (carbapenams, e.g. thienamycins, [C07D 477/00](#))
- 487/06 . . Peri-condensed systems
- 487/08 . . Bridged systems
- 487/10 . . Spiro-condensed systems
- 487/12 . in which the condensed system contains three hetero rings
- 487/14 . . Ortho-condensed systems
- 487/16 . . Peri-condensed systems
- 487/18 . . Bridged systems
- 487/20 . . Spiro-condensed systems
- 487/22 . in which the condensed system contains four or more hetero rings

489/00 Heterocyclic compounds containing 4aH-8, 9 c-Iminoethano-phenanthro [4, 5-b, c, d] furan ring systems, e.g. derivatives of [4, 5-epoxy]-morphinan of the formula:

- 489/02 . with oxygen atoms attached in positions 3 and 6, e.g. morphine, morphinone
- 489/04 . . Salts; Organic complexes
- 489/06 . with a hetero atom directly attached in position 14
- 489/08 . . Oxygen atom
- 489/09 . containing 4aH-8, 9 c-Iminoethano-phenanthro [4, 5-b, c, d] furan ring systems condensed with carbocyclic rings or ring systems
- 489/10 . . with a bridge between positions 6 and 14

- 489/12 . . . the bridge containing only two carbon atoms
- 491/00 Heterocyclic compounds containing in the condensed ring system both one or more rings having oxygen atoms as the only ring hetero atoms and one or more rings having nitrogen atoms as the only ring hetero atoms, not provided for by groups [C07D 451/00](#) - [C07D 459/00](#), [C07D 463/00](#), [C07D 477/00](#) or [C07D 489/00](#)**
- 491/02 . . . in which the condensed system contains two hetero rings
- 491/04 . . . Ortho-condensed systems
- 491/044 . . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring
- 491/048 the oxygen-containing ring being five-membered
- 491/052 the oxygen-containing ring being six-membered
- 491/056 . . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring
- 491/06 . . Peri-condensed systems
- 491/08 . . Bridged systems
- 491/10 . . Spiro-condensed systems
- 491/107 . . . with only one oxygen atom as ring hetero atom in the oxygen-containing ring
- 491/113 . . . with two or more oxygen atoms as ring hetero atoms in the oxygen-containing ring
- 491/12 . . . in which the condensed system contains three hetero rings
- 491/14 . . . Ortho-condensed systems ([alkylenedioxy derivatives of dibenzo \[a, g\] quinolizines, e.g. berberine, C07D 455/03](#))
- 491/147 . . . the condensed system containing one ring with oxygen as ring hetero atom and two rings with nitrogen as ring hetero atom
- 491/153 . . . the condensed system containing two rings with oxygen as ring hetero atom and one ring with nitrogen as ring hetero atom
- 491/16 . . Peri-condensed systems
- 491/18 . . Bridged systems ([3-oxa-9-azatricyclo \[3.3.1.0<2,4>\] nonane ring systems, e.g. scopolamine, C07D 451/00](#))
- 491/20 . . Spiro-condensed systems
- 491/22 . . . in which the condensed system contains four or more hetero rings
- 493/00 Heterocyclic compounds containing oxygen atoms as the only ring hetero atoms in the condensed system**
- 493/02 . . . in which the condensed system contains two hetero rings
- 493/04 . . Ortho-condensed systems
- 493/06 . . Peri-condensed systems
- 493/08 . . Bridged systems
- 493/10 . . Spiro-condensed systems
- 493/12 . . . in which the condensed system contains three hetero rings
- 493/14 . . Ortho-condensed systems
- 493/16 . . Peri-condensed systems
- 493/18 . . Bridged systems
- 493/20 . . Spiro-condensed systems
- 493/22 . . . in which the condensed system contains four or more hetero rings
- 495/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having sulfur atoms as the only ring hetero atoms**
- 495/02 . . . in which the condensed system contains two hetero rings
- 495/04 . . . Ortho-condensed systems
- 495/06 . . . Peri-condensed systems
- 495/08 . . . Bridged systems
- 495/10 . . . Spiro-condensed systems
- 495/12 . . . in which the condensed system contains three hetero rings
- 495/14 . . . Ortho-condensed systems
- 495/16 . . . Peri-condensed systems
- 495/18 . . . Bridged systems
- 495/20 . . . Spiro-condensed systems
- 495/22 . . . in which the condensed system contains four or more hetero rings
- 497/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having oxygen and sulfur atoms as the only ring hetero atoms**
- 497/02 . . . in which the condensed system contains two hetero rings
- 497/04 . . . Ortho-condensed systems
- 497/06 . . . Peri-condensed systems
- 497/08 . . . Bridged systems
- 497/10 . . . Spiro-condensed systems
- 497/12 . . . in which the condensed system contains three hetero rings
- 497/14 . . . Ortho-condensed systems
- 497/16 . . . Peri-condensed systems
- 497/18 . . . Bridged systems
- 497/20 . . . Spiro-condensed systems
- 497/22 . . . in which the condensed system contains four or more hetero rings
- 498/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen and oxygen atoms as the only ring hetero atoms (4-oxa-1-azabicyclo [3.2.0] heptanes, e.g. oxapenicillins [C07D 503/00](#); 5-oxa-1-azabicyclo [4.2.0] octanes, e.g. oxacephalosporins [C07D 505/00](#); analogues thereof having ring oxygen atoms in other position [C07D 507/00](#))**
- 498/02 . . . in which the condensed system contains two hetero rings
- 498/04 . . . Ortho-condensed systems
- 498/06 . . . Peri-condensed systems
- 498/08 . . . Bridged systems
- 498/10 . . . Spiro-condensed systems
- 498/12 . . . in which the condensed system contains three hetero rings
- 498/14 . . . Ortho-condensed systems
- 498/16 . . . Peri-condensed systems
- 498/18 . . . Bridged systems
- 498/20 . . . Spiro-condensed systems
- 498/22 . . . in which the condensed system contains four or more hetero rings

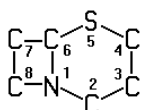
499/00 Heterocyclic compounds containing 4-thia-1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:



Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring

- 499/04 . Preparation
- 499/06 . . by forming the ring or condensed ring systems
(by microbiological processes [C12P 37/00](#))
- 499/08 . . Modification of a carboxyl radical directly attached in position 2, e.g. esterification
- 499/10 . . Modification of an amino radical directly attached in position 6
- 499/12 . . . Acylation
- 499/14 . . Preparation of salts
- 499/16 . . . of alkali or alkaline earth metals
- 499/18 . . Separation; Purification
- 499/20 . . . via salts with organic bases
- 499/21 . with a nitrogen atom directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/22 . . Salts with organic bases; Complexes with organic compounds
- 499/24 . . . with acyclic or carbocyclic compounds containing amino radicals
- 499/26 . . . with heterocyclic compounds
- 499/28 . . with modified 2-carboxyl group
- 499/30 . . . Acid anhydride
- 499/32 . . . Esters
- 499/34 . . . Thio-acid; Esters thereof
- 499/36 O-esters
- 499/38 S-esters
- 499/40 . . . Amides; Hydrazides; Azides
- 499/42 . . Compounds with a free primary amino radical attached in position 6
- 499/44 . . Compounds with an amino radical acylated by carboxylic acids, attached in position 6
- 499/46 . . . with acyclic hydrocarbon radicals or such radicals substituted by carbocyclic or heterocyclic rings, attached to the carboxamido radical
- 499/48 . . . with a carbon chain, substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. ester or nitrile radicals, attached to the carboxamido radical
- 499/50 substituted in beta-position to the carboxamido radical
- 499/52 by oxygen or sulfur atoms
- 499/54 by nitrogen atoms
- 499/56 by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 499/58 substituted in alpha-position to the carboxamido radical
- 499/60 by oxygen atoms
- 499/62 by sulfur atoms
- 499/64 by nitrogen atoms
- 499/66 with alicyclic rings as additional substituents on the carbon chain
- 499/68 with aromatic rings as additional substituents on the carbon chain
- 499/70 with hetero rings as additional substituents on the carbon chain
- 499/72 by carbon atoms having three bonds to hetero atoms
- 499/74 . . . with carbocyclic rings directly attached to the carboxamido radical
- 499/76 . . . with hetero rings directly attached to the carboxamido radical
- 499/78 . . Compounds with an amino radical, acylated by carbonic acid, or by nitrogen or sulfur analogues thereof, attached in position 6
- 499/80 . . Compounds with a nitrogen-containing hetero ring, attached with the ring nitrogen atom in position 6
- 499/86 . with only atoms other than nitrogen atoms directly attached in position 6 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/861 . . with a hydrocarbon radical or a substituted hydrocarbon radical, directly attached in position 6
- 499/865 . . with hetero atoms or with carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 6
- 499/87 . Compounds being unsubstituted in position 3 or with substituents other than only two methyl radicals attached in position 3, and with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/88 . Compounds with a double bond between positions 2 and 3 and a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 499/881 . . with a hydrogen atom or an unsubstituted hydrocarbon radical, attached in position 3
- 499/883 . . with a substituted hydrocarbon radical attached in position 3
- 499/887 . . with a hetero atom or a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 3
- 499/893 . . with a hetero ring or a condensed hetero ring system, directly attached in position 3
- 499/897 . Compounds with substituents other than a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, directly attached in position 2
- 499/90 . further condensed with carbocyclic rings or ring systems

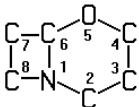
501/00 Heterocyclic compounds containing 5-thia-1-azabicyclo [4.2.0] octane ring systems, i.e. compounds containing a ring system of the formula:



, e.g. cephalosporins;

Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring

- 501/02 . Preparation
- 501/04 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 501/06 . . . Acylation of 7-aminocephalosporanic acid
- 501/08 . . by forming the ring or condensed ring systems (by microbiological processes [C12P 35/00](#))
- 501/10 . . . from compounds containing the penicillin ring system
- 501/12 . . Separation; Purification
- 501/14 . Compounds having a nitrogen atom directly attached in position 7
- 501/16 . . with a double bond between positions 2 and 3
- 501/18 . . . 7-Aminocephalosporanic or substituted 7-aminocephalosporanic acids
- 501/20 . . . 7-Acylaminocephalosporanic or substituted 7-acylaminocephalosporanic acids in which the acyl radicals are derived from carboxylic acids
- 501/22 with radicals containing only hydrogen and carbon atoms, attached in position 3
- 501/24 with hydrocarbon radicals, substituted by hetero atoms or hetero rings, attached in position 3
- 501/26 Methylene radicals, substituted by oxygen atoms; Lactones thereof with the 2-carboxyl group
- 501/28 with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/30 with the 7-amino-radical acylated by an araliphatic carboxylic acid
- 501/32 with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/34 with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/36 Methylene radicals, substituted by sulfur atoms
- 501/38 Methylene radicals, substituted by nitrogen atoms; Lactams thereof with the 2-carboxyl group; Methylene radicals substituted by nitrogen-containing hetero rings attached by the ring nitrogen atom; Quaternary compounds thereof
- 501/40 with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/42 with the 7-amino radical acylated by an araliphatic carboxylic acid
- 501/44 with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/46 with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/48 Methylene radicals, substituted by hetero rings ([C07D 501/38](#) - [C07D 501/46](#) take precedence)
- 501/50 with the 7-amino radical acylated by an aliphatic carboxylic acid, which is substituted by hetero atoms
- 501/52 with the 7-amino radical acylated by an araliphatic carboxylic acid
- 501/54 with the 7-amino radical acylated by an araliphatic carboxylic acid, which is substituted on the aliphatic radical by hetero atoms
- 501/56 with the 7-amino radical acylated by carboxylic acids containing hetero rings
- 501/57 with a further substituent in position 7, e.g. cephamycines
- 501/58 . . . with a nitrogen atom, which is a member of a hetero ring, attached in position 7
- 501/59 . . . with hetero atoms directly attached in position 3
- 501/60 . . with a double bond between positions 3 and 4
- 501/62 . Compounds further condensed with a carbocyclic ring or ring system
- 503/00 Heterocyclic compounds containing 4-oxa-1-azabicyclo [3.2.0] heptane ring systems, i.e. compounds containing a ring system of the formula:**
-
- , e.g. oxapenicillins,
- clavulanic acid derivatives; Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**
- 503/02 . Preparation (by microbiological processes [C12P 17/18](#))
- 503/04 . . by forming the ring or condensed ring systems
- 503/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 503/08 . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 503/10 . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 503/12 . . unsubstituted in position 6
- 503/14 . . . with hydrogen atoms, hydrocarbon or substituted hydrocarbon radicals, other than a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, attached in position 3
- 503/16 Radicals substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical
- 503/18 by oxygen atoms
- 503/20 by sulfur atoms
- 503/22 by nitrogen atoms

- 505/00 Heterocyclic compounds containing 5-oxa-1-azabicyclo [4.2.0] octane ring systems, i.e. compounds containing a ring system of the formula:**
- 
- , e.g. oxacephalosporins;**
- Such ring systems being further condensed, e.g. 2,3-condensed with an oxygen-, nitrogen- or sulfur-containing hetero ring**
- 505/02 . Preparation (by [microbiological processes C12P 17/18](#))
- 505/04 . . by forming the ring or condensed ring systems
- 505/06 . . from compounds already containing the ring or condensed ring systems, e.g. by dehydrogenation of the ring, by introduction, elimination or modification of substituents
- 505/08 . . . Modification of a carboxyl group directly attached in position 2, e.g. esterification
- 505/10 . with a carbon atom having three bonds to hetero atoms with at the most one bond to halogen, e.g. an ester or nitrile radical, directly attached in position 2
- 505/12 . . substituted in position 7
- 505/14 . . . with hetero atoms directly attached in position 7
- 505/16 Nitrogen atoms
- 505/18 further acylated by radicals derived from carboxylic acids or by nitrogen or sulfur analogues thereof
- 505/20 with the acylating radicals further substituted by hetero atoms or by carbon atoms having three bonds to hetero atoms with at the most one bond to halogen
- 505/22 further substituted by singly-bound nitrogen atoms
- 505/24 further substituted by doubly-bound nitrogen atoms
- 507/00 Heterocyclic compounds containing a condensed beta-lactam ring system, not provided for by groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 505/00](#); Such ring systems being further condensed**
- 507/02 . containing 3-oxa-1-azabicyclo [3.2.0] heptane ring systems
- 507/04 . containing 2-oxa-1-azabicyclo [4.2.0] octane ring systems
- 507/06 . containing 3-oxa-1-azabicyclo [4.2.0] octane ring systems
- 507/08 . containing 4-oxa-1-azabicyclo [4.2.0] octane ring systems
- 513/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen and sulfur atoms as the only ring hetero atoms, not provided for in groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#)**
- 513/02 . in which the condensed system contains two hetero rings
- 513/04 . . Ortho-condensed systems
- 513/06 . . Peri-condensed systems
- 513/08 . . Bridged systems
- 513/10 . . Spiro-condensed systems
- 513/12 . in which the condensed system contains three hetero rings
- 513/14 . . Ortho-condensed systems
- 513/16 . . Peri-condensed systems
- 513/18 . . Bridged systems
- 513/20 . . Spiro-condensed systems
- 513/22 . in which the condensed system contains four or more hetero rings
- 515/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having nitrogen, oxygen, and sulfur atoms as the only ring hetero atoms, not provided for in groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#)**
- 515/02 . in which the condensed system contains two hetero rings
- 515/04 . . Ortho-condensed systems
- 515/06 . . Peri-condensed systems
- 515/08 . . Bridged systems
- 515/10 . . Spiro-condensed systems
- 515/12 . in which the condensed system contains three hetero rings
- 515/14 . . Ortho-condensed systems
- 515/16 . . Peri-condensed systems
- 515/18 . . Bridged systems
- 515/20 . . Spiro-condensed systems
- 515/22 . in which the condensed system contains four or more hetero rings
- 517/00 Heterocyclic compounds containing in the condensed system at least one hetero ring having selenium, tellurium or halogen atoms as ring hetero atoms**
- 517/02 . in which the condensed system contains two hetero rings
- 517/04 . . Ortho-condensed systems
- 517/06 . . Peri-condensed systems
- 517/08 . . Bridged systems
- 517/10 . . Spiro-condensed systems
- 517/12 . in which the condensed system contains three hetero rings
- 517/14 . . Ortho-condensed systems
- 517/16 . . Peri-condensed systems
- 517/18 . . Bridged systems
- 517/20 . . Spiro-condensed systems
- 517/22 . in which the condensed system contains four or more hetero rings
- 519/00 Heterocyclic compounds containing more than one system of two or more relevant hetero rings condensed among themselves or condensed with a common carbocyclic ring system not provided for in groups [C07D 453/00](#) or [C07D 455/00](#)**
- 519/02 . Ergot alkaloids of the cyclic peptide type
- 519/04 . Dimeric indole alkaloids, e.g. vincalucoblastine
- 519/06 . containing at least one condensed beta-lactam ring system, provided for by groups [C07D 463/00](#), [C07D 477/00](#) or [C07D 499/00](#) - [C07D 507/00](#), e.g. a penem or a cepham system

521/00 Heterocyclic compounds containing unspecified hetero rings

NOTE

This group is only used for the classification of heterocyclic compounds the chemical structure of which is not specified, i.e. only in those cases where the heterocyclic compounds cannot be classified in any of groups [C07D 201/00](#) - [C07D 519/00](#)